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Number System

Basics of Number System

(1). Face Value: It is nothing but the number itself about which it has been asked.
Eg: In the number 23576, face value of 5 is 5 and face value of 7 is 7.

(2). Place Value: The place value of a number depends on its position in the number. Each position has a value 10^n, the places to its right.
Eg: In the number 23576, place value of 5 is 500 and place value of 3 is 3000.

Types of Numbers

(1). Natural Numbers (N) :
All positive counting numbers. (0 is not included in it.)
Examples: 1, 2, 3, 4 … etc.

(2). Whole Numbers (W): All non-negative numbers are all whole numbers.
Examples: 0, 1, 2, 3, 4… etc.

(3). Integer Numbers (I): All positive numbers and negative numbers including zero. Positive numbers are called positive integers and negative numbers are called negative integers.
I = ….. , -4, - 3, - 2, - 1, 0, 1, 2, 3, 4 ……

(4). Even Numbers
2, 4, 6, 8, 10….. [Divisible by 2 completely]

(5). Odd Numbers: 1, 3, 5, 7, 9, 11….. [Not divisible by 2 completely]

(6). Rational Numbers : Numbers whose exact value can be determined.

Examples : $\frac{3}{4}$ = 0.75, $\frac{4}{5}$ = 0.8

(7). Irrational Numbers : Numbers whose exact value cannot be determined.

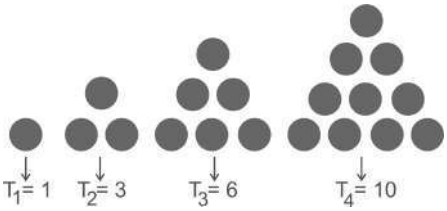
Example : $\pi = \frac{22}{7}$ = 3.142857142857 …

(8). Prime number : A number which is divisible by 1 and itself. 2 is only an even prime number.
Example : 2, 3, 5, 7, 11, etc.
Note:-
Total prime no. between 1 - 50 ⇒ 15
Total prime no. between 1 - 100 ⇒ 25
Total prime no. between 1 - 500 ⇒ 95
Total prime no. between 1 - 1000 ⇒ 168

(9). Composite number : If we remove all prime numbers from natural numbers then whatever is left is called Composite numbers.
Example : 4, 6, 8, 9, 10, 12 etc.

Note :- 1 is neither prime nor composite.
(10). Co - prime number : Two numbers are called Co-prime numbers if their HCF is 1.
Example : (2 and 3), (6 and 11).
Note : Two prime numbers are always co-prime numbers to each other. Any two consecutive integers are always co-prime number to each other.

(11). Triangular number : The triangular number sequence is the representation of the numbers in the form of an equilateral triangle arranged in a series or sequence.
These numbers are in a sequence of 1, 3, 6, 10, 15, 21, 28, 36, 45, and so on.



Formula : $\frac{n(n+1)}{2}$

Where n is the sequence of the number i.e. n = 1, 2, 3…….so on
Example : for finding seventh triangular number put n = 7
So seventh triangular number
= $\frac{7(7+1)}{2}$ = $\frac{7(8)}{2}$ = 28

Factors

The factors of a number are the numbers that divide it completely without leaving any remainder.

Example : 24 can be completely divided by 1, 2, 3, 4, 6, 8, 12 and 24, so these numbers are factors of 24.

Prime factorisation of a number : When a number is written in the form of multiplication of its prime factors, it's called prime factorisation.
Prime factorisation of 24.

2	24
2	12
2	6
	3

24 → 2 × 2 × 2 × 3 or $2^3 \times 3^1$

Number of factors : To find the number of factors we write the number in the form of prime factors and then add +1 to the exponent of prime factors and multiply them.
For example: 24 = $2^3 \times 3^1$
Number of factors of 24 → (3 + 1)(1 + 1) = 4 × 2 = 8.
With the help of an example, we try to find the sum of all factors of a number.
24 = $2^3 \times 3^1$,
Sum of all factors = $(2^0 + 2^1 + 2^2 + 2^3) \times (3^0 + 3^1)$ = 15 × 4 = 60.

Number of even factors of a number : To find the number of even factors of a number, we add +1 to the exponents of prime numbers except 2.
(Note : If a number doesn't have 2 as its factor it will have 0 even factors)
Que. Find the number of even factors of 120.
Ans. 120 = $2^3 \times 3^1 \times 5^1$
Number of even factors = 3 × (1 + 1) × (1 + 1) = 3 × 2 × 2 = 12

Note :- To find **the sum of even factors**, we shall ignore 2^0,

Que. Find the sum of even factors of 120.
Sol:-Sum of even factors = $(2^1 + 2^2 + 2^3)(3^0 + 3^1)(5^0 + 5^1)$ = 14 × 4 × 6 = 336.

Number and Sum of odd factors of a number : to find the number and sum of odd factors of a number, we have to ignore the exponents of 2.

Que. Find the number of odd factors 120.
Sol:- 120 = $2^3 \times 3^1 \times 5^1$
Required number = (1 + 1)(1 + 1) = 4
The exponent Number system of 2 is completely ignored.
Sum of odd factors of 120 = $(3^0 + 3^1)(5^0 + 5^1)$ = 4 × 6 = 24

Some Important Results of Factors:
1001 = 7 × 11 × 13
1001 × abc = abcabc
1001 × 234 = 234234

Que: Which of the following is a factor of 531531?
(a) 15 (b) 13 (c) 11 (d) both b and c

Sol:- 531531 = 1001 × 531
= 7 × 11 × 13 × 531 So, both 11 and 13 are factors of 531531.
111 = 37 × 3 , 1001 × 111 = 111111,
When a single digit is written 6 times, 3, 7, 11, 13, and 37 are factors of it.

Que. Which of the following is a factor of 222222 ?
(a) 17 (b) 57 (c) 68 (d) 74

Sol:- 222222 = 2 × 111111
= 2 × 3 × 7 × 11 × 13 × 37
Clearly, 2 × 37 = 74 is one of the factors.

Recurring Decimal

Recurring decimals are referred to as

numbers that are uniformly repeated after the decimal. Some rational numbers produce recurring decimals after converting them into decimal numbers, but all irrational numbers produce recurring decimals after converting them into decimal form.

Examples :

(1) $\frac{1}{3}$ = 0.3333333 ..... = $0.\overline{3}$

(2) $\frac{22}{7}$ = 3.142857142857 ...

= $3.\overline{142857}$

(3) $0.\overline{9} = \frac{9}{9} = 1$

(4) $0.5\overline{327} = \frac{5327-53}{9900} = \frac{5274}{9900}$

Divisibility Test

By 2:- When last digit is 0 or an even number eg: 520, 588

By 3:- Sum of digits is divisible by 3 eg: 1971, 1974

By 4:- When last two digits are divisible by 4 or, they are zeros eg: 1528, 1700

By 5 :- When last digit is 0 or 5 eg: 1725, 1790

By 6 :- When the number is divisible by 2 and 3 both. eg: 36, 72

By 7 : - Subtract twice the last digit from the number formed by the remaining digits. Like 651 divisible by 7
65 - (1 × 2) = 63. Since 63 is divisible by 7, so is 651.

By 8 :- When the last three digits are divisible by 8. eg: 2256

By 9 :- When sum of digit is divisible by 9 eg: 9216

By 10 :- When the last digit is 0. eg: 452600

By 11:- When the difference between the sum of odd and even place digits is equal to 0 or multiple of 11 eg: 217382
Sum of odd place digits = 2 + 7 + 8 = 17
Sum of even place digits = 1 + 3 + 2 = 6
17 – 6 = 11, hence 217382 is divisible by 11.

By 13 : - If adding four times the last digit to the number formed by the remaining digits is divisible by 13, then the number is divisible by 13. Like 1326 is divisible by 13
132 + (6 × 4) = 156. Repeat the same process for 156 .
15 + (6 × 4) = 39.so 39 is divisible by 13

BY 17 :-The divisibility rule of 17 states, "If the difference between 5 times the last digit and the rest is either 0 or multiple of 17, then the number is divisible by 17".
Like 221: 22 − 1 × 5 = 17.

Prime Number Test

For finding whether any number is a prime number or not, we need to find the nearest square root of given number, then we need to find out whether the given number is divisible by any prime number less than the obtained number or not. If it is divisible then it is not a prime number and if not divisible then it is a prime number.
Example : Find whether 177 is a prime number or not.
Soln : Nearest square root of 177 is 13. Now we need to check whether 177 is divisible by prime numbers less than 13. On checking we find that 177 is divisible by 3. Hence, 177 is not a prime number.

Important Formulas

1. Sum of first n natural number
s = $\frac{n(n+1)}{2}$

2. Sum of first n odd numbers = n^2

3. Sum of first n even numbers
= $n(n+1)$

4. Sum of square of first n natural numbers = $\frac{n(n+1)(2n+1)}{6}$

5. Sum of cubes of first n natural number = $(\frac{n(n+1)}{2})^2$

6. $(x^m - a^m)$ is divisible by $(x-a)$ for every natural number m.

7. $(x^m - a^m)$ is divisible by $(x+a)$ for even values of m.

8. $(x^m + a^m)$ is divisible by $(x+a)$ for odd values of m.

9. Number of prime factors of a^p, b^q, c^r, d^s is $p+q+r+s$ when a, b, c, d are all prime numbers.

Number of Zeros in an expression

We shall understand this concept with the help of an example.
Let's find the number of zeros in the following expression: 24 × 32 × 17 × 23 × 19 = $(2^3 \times 3^1) \times 2^5 \times 17 \times 23 \times 19$
Notice that a zero is made only when there is a combination of 2 and 5. Since there is no '5' here there will be no zero in the above expression.
Example:
$8 \times 15 \times 23 \times 17 \times 25 \times 22 =$
$2^3 \times (3^1 \times 5^1) \times 23 \times 17 \times 5^2 \times 2^1 \times 11$
In this expression there are 4 twos and 3 fives. From this 3 pairs of 5×2 can be formed. Therefore, there will be 3 zeros in the final product.

Que. Find the number of zeros in the value of:
$2^2 \times 5^4 \times 4^6 \times 10^8 \times 6^{10} \times 15^{12} \times 8^{14} \times 20^{16} \times 10^{18} \times 25^{20}$.

Sol:-
$2^2 \times 5^4 \times 4^6 \times 10^8 \times 6^{10} \times 15^{12} \times 8^{14} \times 20^{16} \times 10^{18} \times 25^{20}=$
$2^2 \times 5^4 \times 2^{12} \times 2^8 \times 5^8 \times 2^{10} \times 3^{10} \times 3^{12} \times 5^{12} \times 2^{42} \times 2^{32} \times 5^{16} \times 2^{18} \times 5^{18} \times 5^{40}$
Zeros are possible with a combination of 2×5
Here the number of 5's are less so the number of zeros will be limited to the number of 5's.
In this expression number of fives are:
$5^4 \times 5^8 \times 5^{12} \times 5^{16} \times 5^{18} \times 5^{40}$;
i.e. 4 + 8 + 12 + 16 + 18 + 40 = 98

The number of Zeros in n!

To find the number of zeros in n!, we divide "n" by 5 until we get a number less than 5, and then we add all the quotients so obtained.

Que. Find the number of zeros in 36! .

5	36	
5	7	(1)
	1	(2)

The number of zeros = 7 + 1 = 8.

Remainder Theorem

Que. What will be the remainder when 17×23 is divided by 12?

Ans :- We can write:
17 × 23 = 12 + 5 × 12 + 11
= 12 × 12 + 12 × 11 + 5 × 12 + 5 × 11
In the above expression we will find that remainder will depend on the last term i.e. 5×11

Now, $rem.(\frac{5 \times 11}{12})$ = 7.

So, $\frac{12 \times 12 + 12 \times 11 + 5 \times 12 + 5 \times 11}{12}$

and $\frac{5 \times 11}{12}$ remainder is same in both cases which is 7.

Example:- Remainder when
$1421 \times 1423 \times 1425$ is divided by 12?

$rem(\frac{1421 \times 1423 \times 1425}{12})$

$= rem(\frac{5 \times 7 \times 9}{12}) = rem(\frac{35 \times 9}{12})$

$= rem(\frac{11 \times 9}{12}) = 3$

Negative Remainder

Taking a negative remainder will make our calculation easier.

Examples

(i) *rem* $(\frac{7 \times 8}{9})$ = *rem* $(\frac{-2 \times -1}{9})$

$= -2 \times -1 = 2$

(ii) *rem* $(\frac{55 \times 56}{57})$ = *rem* $(\frac{-2 \times -1}{57})$

$= -2 \times -1 = 2$

(iii) *rem* $(\frac{7 \times 10}{9})$ = *rem* $(\frac{-2 \times 1}{9})$

$= -2 \times 1 = -2 \; or, \; 7$

Large Power Concepts

Look at the following examples:

(i) rem $(\frac{28^{12345}}{9})$ = $rem(\frac{(27+1)^{12345}}{9})$

= rem $(\frac{1^{12345}}{9}) = 1^{12345} = 1$

(ii) rem $(\frac{26^{12345}}{9})$

= $rem \; (\frac{(27-1)^{12345}}{9})$

= rem $(\frac{-1^{12345}}{9})$ = - 1^{12345} = - 1 or 8

Application of Remainder Theorem

Que. Find the last two digits of the expression

$22 \times 31 \times 44 \times 27 \times 37 \times 43$?

Sol:- If we divide the above expression by 100, we will get the last two digits as remainder.

$\Rightarrow rem(\frac{22 \times 31 \times 44 \times 27 \times 37 \times 43}{100})$,

dividing by 4 to make it simple

$= rem(\frac{22 \times 31 \times 11 \times 27 \times 37 \times 43}{25})$

$= rem(\frac{132 \times 22 \times 216}{25})$

$= rem(\frac{7 \times 22 \times 16}{25}) \quad \Rightarrow rem(\frac{4 \times 16}{25})$

$= rem(\frac{14}{25}) = 14$

Since we had divided by 4 initially now to get the correct answer, we need to multiply the remainder by 4.

So remainder will be $14 \times 4 = 56$, which will also be the last two digits of the expression.

Variety Questions

Q.1. A number, when divided by the sum of 335 and 265, gives three times the difference between 335 and 265 as the quotient and 35 as the remainder. What is that number ?

Group D 22/08/2022 (Morning)

(a) 126035 (b) 128235

(c) 124535 (d) 127535

Q.2. If the 8 - digit number 3x5479y4 is divisible by 88 and the 8-digit number 425139z2 is divisible by 9, then what is the greatest possible value of (3x + 2y - z)?

Group D 09/09/2022 (Evening)

(a) 25 (b) 33 (c) 35 (d) 37

Q.3. By adding 2 to the numerator and 5 to the denominator of a fraction, the fraction obtained is equal to $\frac{1}{2}$. Also, the fraction obtained by subtracting 2 from both the numerator and the denominator is equal to $\frac{1}{3}$. Find the Fraction .

Group D 24/08/2022 (Afternoon)

(a) $\frac{4}{17}$ (b) $\frac{8}{15}$ (c) $\frac{1}{7}$ (d) $\frac{3}{5}$

Q.4. Four prime numbers are taken in ascending order. The product of the first three prime numbers is 1771 and the sum of the last two prime numbers is 82. What is the product of the last two prime numbers ?

Group D 25/08/2022 (Afternoon)

(a) 1387 (b) 1127 (c)1537 (d) 1357

Q.5. Find the sum of the prime factors of $9^6 \times 12^4 \times 7^7$?

Group D 26/08/2022 (Evening)

(a) 13 (b) 12 (c) 14 (d) 11

Q.6. If the 5-digit number 688xy is divisible by 11 and 21, then what is the value of (8x - 3y + xy) ?

Group D 12/09/2022 (Morning)

(a) 6 (b) 24 (c) 15 (d) 13

Q.7. From the numbers 367, 489, 514, 632 and 728, if 2 is added to the first digit of each of the numbers, how many new numbers will be thus formed whose sum of all digits will be divisible by three? (Example-697 - First digit-6, second digit-9 and third digit-7)

Group D 17/09/2022 (Morning)

(a) One (b) Three (c) Four (d) Two

Q.8. The product of two consecutive positive integers is 552. If the smaller of these two integers is represented by x, which of the options below will correspond to the equation for finding out the value of x ?

Group D 20/09/2022 (Afternoon)

(a) $x^2 + x + 552 = 0$

(b) $x^2 - x + 552 = 0$

(c) $x^2 + x - 552 = 0$

(d) $x^2 - x - 552 = 0$

Q.9. If 12600 = $p^3 \times q^2 \times r^2 \times s^1$, where p, q, r and s are consecutive prime numbers in ascending order, then what is the value of $(3p + 2q - r + s)$?

Group D 11/10/2022 (Afternoon)

(a) 12 (b) 13 (c) 14 (d) 17

Q.10. Arushi was to multiply a number by 2.4, but instead multiplied by 4.2. If the product she obtained was 65.1, then what is the correct product that she should have got ?

NTPC CBT II Level 5 (12/06/2022) Shift 1

(a) 36.50 (b) 46.88 (c) 37.20 (d) 113.93

Q.11. In what way can the terms of the given set be rearranged into three sets such that the sum of the two terms in each set is equal ?

(947, 861, 1304, 1218, 1378, 787)

NTPC CBT II Level 5 (15/06/2022) Shift 2

(a) (787, 1378), (947, 1304), (861, 1218)

(b) (947, 1218), (861, 1304), (787, 1378)

(c) (861, 1218), (947, 1378), (787, 1304)

(d) (947, 1304), (861, 1378), (787, 1218)

Q.12. 6889 students are sitting in an auditorium in such a manner that there are as many students in a row as there are rows in the auditorium. How many rows are there in the auditorium ?

NTPC CBT - I 29/12/2020 (Afternoon)

(a) 73 (b) 87 (c) 83 (d) 77

Q.13. If $1^2 + 2^2 + 3^2 +$.....$+14^2 = 1015$, then $3^2 + 6^2 + 9^2$.....$+ 42^2$ is equal to

NTPC CBT - I 29/12/2020 (Morning)

(a) 9135 (b) 9325 (c) 9235 (d) 9315

Q.14. Which of the following is NOT a rational number ?

$\sqrt{3^2 + 4^2}$, $\sqrt{12.96}$, $\sqrt{125}$ and $\sqrt{900}$

NTPC CBT - I 05/01/2021 (Morning)

(a) $\sqrt{900}$ (b) $\sqrt{125}$

(c) $\sqrt{3^2 + 4^2}$ (d) $\sqrt{12.96}$

Q.15. The least multiple of 23 when divided by 18 , 21 and 24 leaves the remainder 7 , 10 and 13 respectively. The number is;

NTPC CBT - I 07/01/2021 (Morning)

(a) 3131 (b) 3013 (c) 3103 (d) 3113

Q.16. How many times is digit 3 passed in counting from 301 to 399?

NTPC CBT - I 10/01/2021 (Evening)

(a) 121 (b) 119 (c) 11 (d) 21

Q.17. $(1 - \frac{1}{n}) + (1 - \frac{2}{n}) + (1 - \frac{3}{n})$ + up to n terms will result as:
NTPC CBT - I 10/01/2021 (Evening)
(a) $\frac{1}{2n-1}$ (b) $\frac{1}{2n}$ (c) $\frac{1}{n^2}$ (d) $\frac{n-1}{2}$

Q.18. In competitive examination, 1 mark is awarded for correct answer, 0 mark for unanswered and $\frac{1}{2}$ Mark is deducted for every wrong answer. Ambika answered 120 questions and got 90 marks.How many answers were correct ?
NTPC CBT - I 10/01/2021 (Evening)
(a) 60 (b) 110 (c) 100 (d) 98

Q.19. If a,b,c,d and e are the digits of a number beginning from the left, then the number is:
NTPC CBT - I 04/02/2021 (Morning)
(a) 100a + 10b + 10c + d + e
(b) 1000a + 100b + 10c + 1d + e
(c) edcba
(d) $10^4a + 10^3b + 10^2c + 10d + e$

Q.20. There are 40 persons in the palace. If every person shakes hands with every other person, what will be the total number of handshakes ?
NTPC CBT - I 21/01/2021 (Morning)
(a) 780 (b) 750 (c) 790 (d) 800

Q.21. When you reverse the digits of the number 14, the number increases by 27. How many other two-digit numbers increase by 27 , when their digits are reversed ?
NTPC CBT - I 22/01/2021 (Evening)
(a) 4 (b) 6 (c) 7 (d) 5

Q.22. A boy was set to multiply 495 by 36, but reading one of the digits in the questions erroneously, he obtained 16740 as his answer. Which digit did he read erroneously ?
NTPC CBT - I 27/01/2021 (Evening)
(a) 9 (b) 8 (c) 2 (d) 7

Q.23. Assuming A = 1 , B = 2 and so on ……. Z = 26 , find the value of the following equation.
$(I^2 - C^2 \times \frac{P}{R}) + 8$
NTPC CBT - I 12/02/2021 (Morning)
(a) 90 (b) 73 (c) 81 (d) 78

Q.24. Find the value of $\frac{1}{1\times4} + \frac{1}{4\times7} + \frac{1}{7\times10} + \ldots\ldots + \frac{1}{47\times50}$.
NTPC CBT - I 16/02/2021 (Evening)
(a) $\frac{47}{150}$ (b) $\frac{49}{50}$ (c) $\frac{49}{150}$ (d) $\frac{47}{50}$

Q.25. If the sum of two numbers is r and their quotient is $\frac{s}{t}$ then the numbers are.
NTPC CBT - I 17/02/2021 (Morning)
(a) $\frac{r}{s}$ and $\frac{r}{t}$ (b) $\frac{sr}{s+t}$ and $\frac{tr}{s+t}$
(c) $\frac{rs}{t}$ and $\frac{ts}{r}$ (d) $\frac{r-s}{t}$ and $\frac{r-t}{s}$

Q.26. If the arithmetic mean and geometric mean of two observations are 10 and 5, respectively, then find the sum of the squares of the observations.
NTPC CBT - I 11/03/2021 (Evening)
(a) 295 (b) 275 (c) 225 (d) 350

Q.27. Determine the integer n such that $\frac{n}{160}$ is less than $\frac{1}{16}$ but more than $\frac{1}{20}$.
NTPC CBT - I 11/03/2021 (Evening)
(a) 7 (b) 8 (c) 6 (d) 9

Q.28. What would be the highest value of X and Z in the given equation?
9X7 + 8YZ + 7Z1 = 2526
NTPC CBT - I 02/03/2021 (Evening)
(a) X = 7, Z = 8 (b) X = 9, Z = 2
(c) X = 9, Z = 1 (d) X = 3, Z = 8

Q.29. If P is a prime number and P divides Q^2, then P will NOT necessarily divide:
NTPC CBT - I 27/03/2021 (Morning)
(a) 3Q (b) Q + 1 (c) $2Q^2$ (d) Q

Q.30. When 43 is divided by x, the remainder is x-5. If x is a natural number, how many solutions will x have ?
NTPC CBT - I 23/07/2021 (Evening)
(a) 5 (b) 4 (c) 6 (d) 3

Q.31. X attempts 94 questions and gets 141 marks. If for every correct answer 4 marks is given, and for every wrong answer 1 mark is deducted, then the number of questions wrongly answered by X is_____ .
RRB ALP Tier - I 17/08/2018 (Morning)
(a) 45 (b) 57 (c) 47 (d) 40

Practice Questions

RRC Group D
(17/08/2022 to 11/10/2022)

Q.32. Which of the following is divisible by both 4 and 8 ?
Group D 17/08/2022 (Afternoon)
(a) 4382 (b) 8342 (c) 3824 (d) 3842

Q.33. Find the number of 2-digit numbers divisible by both 2 and 4.
Group D 17/08/2022 (Evening)
(a) 12 (b) 42 (c) 22 (d) 32

Q.34. If x and y are the two digits of the number 115 xy such that this number is divisible by 90, then the value of x + y is:
Group D 18/08/2022 (Morning)
(a) 3 (b) 2 (c) 6 (d) 5

Q.35. The smallest natural number that must be added to 1212 to make it a perfect square is:
Group D 18/08/2022 (Afternoon)
(a) 13 (b) 27 (c) 18 (d) 24

Q.36. Which of the following pairs of numbers are co - primes ?
Group D 18/08/2022 (Afternoon)
(a) 34 and 35 (b) 17 and 170
(c) 12 and 18 (d) 7 and 14

Q.37. Find the smallest number by which 6300 must be multiplied to make it a perfect square.
Group D 18/08/2022 (Afternoon)
(a) 6 (b) 12 (c) 15 (d) 7

Q.38. The sum of two numbers is 32 and one of them exceeds the other by 18. Find the greater number.
Group D 18/08/2022 (Evening)
(a) 27 (b) 25 (c) 28 (d) 24

Q.39. Which of the following pairs is NOT coprime ?
Group D 18/08/2022 (Evening)
(a) (11, 13) (b) (15, 17)
(c) (17, 23) (d) (17, 34)

Q.40. Mohit's salary is ₹15,000 per month. He spends ₹5,000 on house rent. ₹2000 on bills and rest of the amount is his monthly savings. Find his savings in a year, if in the month of his birthday he spent his complete monthly saving for birthday celebration.
Group D 18/08/2022 (Evening)
(a) ₹88,000 (b) ₹8,000
(c) ₹17,000 (d) ₹ 96,000

Q.41. The sum of the double of the largest two-digit prime number and triple of the largest three-digit prime number is equal to _____.
Group D 22/08/2022 (Afternoon)
(a) 3185 (b) 3029 (c) 2195 (d) 6523

Q.42. From the numbers 51, 52, 53,..... 100. find the sum of the smallest and the greatest prime numbers as given.
Group D 22/08/2022 (Afternoon)
(a) 123 (b) 150 (c)139 (d) 154

Q.43. 3 pencils and 5 pens together cost ₹81 , whereas 5 pencils and 3 pens together cost ₹71. The cost of 1 pencil and 2 pens together is :
Group D 22/08/2022 (Afternoon)

(a) ₹29 (b) ₹35 (c) ₹26 (d) ₹31

Q.44. The sum of the digits in a two-digit number is 9. If the value of the number is 6 more than 5 times the digit in the ones' place, then the number is:
Group D 22/08/2022 (Evening)
(a) 45 (b) 18 (c) 27 (d) 36

Q.45. The sum of the first 8 prime numbers divided by 7 equal to _____
Group D 22/08/2022 (Evening)
(a) 14 (b) 11 (c) 13 (d) 10

Q.46. The sum of three consecutive multiples of 9 is 2457, find the largest one.
Group D 23/08/2022 (Morning)
(a) 828 (b) 990 (c) 819 (d) 999

Q.47. The total number of three-digit numbers divisible by 2 or 5 is ?
Group D 23/08/2022 (Afternoon)
(a) 540 (b) 400 (c) 245 (d) 270

Q.48. There are two consecutive natural numbers such that the sum of their squares is 313. Find the smaller of these two numbers.
Group D 24/08/2022 (Morning)
(a) 12 (b) 13 (c) 14 (d) 15

Q.49. The value of 1 + 3 + 5 + 7 + ··· + 21 =
Group D 25/08/2022 (Morning)
(a) 121 (b) 211 (c) 108 (d) 144

Q.50. How many numbers between 1 to 150 are divisible by 3 and 4 both ?
Group D 26/08/2022 (Morning)
(a) 10 (b) 11 (c) 12 (d) 9

Q.51. If $4 + 4^{n+5} = 260$, then find the value of 5^{n+3}.
Group D 26/08/2022 (Afternoon)
(a) 25 (b) 36 (c) 49 (d) 16

Q.52. The prime factorisation of the number 266805 is:
Group D 29/08/2022 (Morning)
(a) $3^3 \times 5^2 \times 7 \times 11^2$
(b) $3^2 \times 5 \times 7^2 \times 11^2$
(c) $3^4 \times 5^2 \times 7^2 \times 11^2$
(d) $3 \times 5 \times 7^3 \times 11^2$

Q.53. When a number is divided by a divisor, the remainder is 16. When twice the original number is divided by the same divisor, the remainder is 3. Find the value of that divisor.
Group D 30/08/2022 (Afternoon)
(a) 29 (b) 51 (c) 23 (d) 53

Q.54. The sum of two numbers is 27. Five times one number is equal to 4 times the other. The smaller of the two numbers is:
Group D 30/08/2022 (Afternoon)
(a) 15 (b) 12 (c) 11 (d) 13

Q.55. The sum of a two-digit number and the number obtained by reversing the digits is 99. If the digits of the number differ by 5, then the two-digit number can be:
Group D 01/09/2022 (Morning)
(a) 27 (b) 16 (c) 83 (d) 18

Q.56. The sum of a number, its half, its $\frac{1}{3}$ and 27 , is 71. Find the number.
Group D 01/09/2022 (Afternoon)
(a) 25 (b) 24 (c) 22 (d) 23

Q.57. Three numbers x ≤ y ≤ z which are co-prime to each other are such that the product of the first two numbers is 143 and that of the last two numbers is 195. The sum of the three numbers is _____.
Group D 01/09/2022 (Afternoon)
(a) 29 (b) 39 (c) 62 (d) 45

Q.58. Find the smallest number that can be added to 467851 to make the sum a perfect square.
Group D 01/09/2022 (Afternoon)
(a) 5 (b) 3 (c) 6 (d) 4

Q.59. The sum of two positive numbers is 45 and their difference is 19. What are the numbers ?
Group D 01/09/2022 (Evening)
(a) 32, 13 (b) 30, 15 (c) 25, 20 (d) 31, 15

Q.60. Find the greatest number by which when the numbers 158 and 215 are divided, it leaves remainders 4 and 5 , respectively.
Group D 02/09/2022 (Morning)
(a) 7 (b) 21 (c) 18 (d) 14

Q.61. The sum of two consecutive multiples of 6 is 66. Find the smaller of these two multiples.
Group D 02/09/2022 (Morning)
(a) 42 (b) 30 (c) 36 (d) 24

Q.62. If the number 6484y6 is divisible by 8, then find the least value of y ?
Group D 02/09/2022 (Afternoon)
(a) 7 (b) 3 (c) 1 (d) 4

Q.63. Five times a number is 65 . Find the number.
Group D 02/09/2022 (Evening)
(a) 15 (b) 11 (c) 13 (d) 10

Q.64. How many prime numbers are there between 20 and 80 ?
Group D 02/09/2022 (Evening)
(a) 15 (b) 14 (c) 13 (d) 16

Q.65. When a number is divided by 15, the remainder is 9. What will be the remainder when the same number is divided by 5 ?
Group D 05/09/2022 (Morning)
(a) 2 (b) 3 (c) 1 (d) 4

Q.66. Which of the following is the smallest composite number ?
Group D 05/09/2022 (Evening)
(a) 3 (b) 4 (c) 2 (d) 1

Q.67. Find the number whose one-third exceeds its one - fifth by 6.
Group D 06/09/2022 (Afternoon)
(a) 50 (b) 45 (c) 40 (d) 35

Q.68. A two digit number is equal to 7 times the sum of its digits. The number obtained by interchanging the places of the digits is 18 less than the original number. Find the product of the digits of the number.
Group D 06/09/2022 (Evening)
(a) 10 (b) 12 (c) 18 (d) 8

Q.69. Find the total number of prime numbers less than 50.
Group D 06/09/2022 (Evening)
(a) 13 (b) 15 (c) 17 (d) 14

Q.70. If $(\frac{3}{7})^8 \times (\frac{3}{7})^{-14} = (\frac{3}{7})^{3P-3}$ then find the value of p.
Group D 06/09/2022 (Evening)
(a) - 1 (b) - 2 (c) 1 (d) 0

Q.71. The sum of three consecutive natural numbers is 141. The middle number is :
Group D 09/09/2022 (Evening)
(a) 46 (b) 47 (c) 56 (d) 57

Q.72. If x + y= 18 , Product of x and y is 77, then which of the following pairs of numbers can be the values of x and y. Respectively ?
Group D 12/09/2022 (Afternoon)
(a) 12 and 6 (b) 11 and 7
(c) 9 and 9 (d) 8 and 10

Q.73. The sum of five consecutive numbers is 240. The sum of the first and last numbers is :
Group D 12/09/2022 (Afternoon)
(a) 96 (b) 126 (c) 106 (d) 116

Q.74. The value of
$(11^0 + 21^0 - 7^0 + 3^0) \times 5^0$ is:
Group D 12/09/2022 (Evening)
(a) 0 (b) 2 (c) 1 (d) 3

Q.75. Which of the following is divisible by 2 , 3 , and 5 ?

Group D 13/09/2022 (Morning)
(a) 3150 (b) 14175 (c) 54332 (d) 2240

Q.76. The sum of twice a number and three times of 52 is 342. What is the sum of four times the number and two times 52 ?
Group D 13/09/2022 (Morning)
(a) 676 (b) 776 (c) 476 (d) 576

Q.77. The sum of two numbers is 9 and the sum of their squares are 41. The numbers are :
Group D 13/09/2022 (Afternoon)
(a) 5, 4 (b) 1, 8 (c) 6, 3 (d) 7, 2

Q.78. The sum of five consecutive even numbers is 2720. The sum of the third and fifth numbers is:
Group D 13/09/2022 (Afternoon)
(a) 1392 (b) 1292 (c) 1192 (d) 1092

Q.79. If 1 is added to the first digits and 1 is subtracted from the last digits of each of the following numbers, then in how many numbers will the first digit be exactly divisible by the last digit ?
242 , 657 , 864 , 264 , 674 , 218 , 845
Group D 14/09/2022 (Morning)
(a) 2 (b) 1 (c) 3 (d) 0

Q.80. If each digit of the number 72514368 is subtracted from 9, how many even digits will be there in the newly formed number ?
Group D 14/09/2022 (Morning)
(a) 3 (b) 5 (c) 6 (d) 4

Q.81. If each of the digits in the number 354698329 is arranged in ascending order from left to right, then the position of how many digits will change as compared to that in the original number ?
Group D 14/09/2022 (Morning)
(a) 5 (b) 6 (c) 4 (d) 8

Q.82. (6 , y) is a pair of co-prime numbers where y is a natural number not exceeding 20. How many possible values of y are there ?
Group D 15/09/2022 (Afternoon)
(a) 6 (b) 7 (c) 8 (d) 5

Q.83. The smallest prime number is:
Group D 15/09/2022 (Evening)
(a) 1 (b) 4 (c) 3 (d) 2

Q.84. If 11 is subtracted from each of the following numbers and the digits of each number are written in reverse order and then the numbers are arranged in ascending order, the position of how many numbers will not change ?
167, 876, 567, 187, 873
Group D 15/09/2022 (Evening)
(a) Two (b) Four (c) One (d) Three

Q.85. What is the positive difference between the sum of all prime numbers between 11 and 20 (both included) and the sum of all prime numbers between 30 and 50 (both included) ?
Group D 15/09/2022 (Evening)
(a) 141 (b) 135 (c) 137 (d) 139

Q.86. The number of non-square numbers between 87^2 and 88^2 is:
Group D 16/09/2022 (Morning)
(a) 174 (b) 164 (c) 184 (d) 154

Q.87. the smallest natural number which is divisible by 8, 12, 28 and 36 is :
Group D 16/09/2022 (Afternoon)
(a) 504 (b) 168 (c) 252 (d) 336

Q.88. The sum of the digits of a two-digit number is 12. The number obtained by interchanging its digits exceeds the given number by 18. The number is:
Group D 16/09/2022 (Afternoon)
(a) 76 (b) 57 (c) 27 (d) 67

Q.89. The sum of the squares of two consecutive odd natural numbers is 74. The sum of the numbers is:
Group D 16/09/2022 (Evening)
(a) 12 (b) 18 (c) 24 (d) 28

Q.90. A two - digit number z is exactly six times the sum of its digits and the difference of the number formed by reversing the digits of z from the original number z is 9. Then z is:
Group D 16/09/2022 (Evening)
(a) 54 (b) 45 (c) 42 (d) 36

Q.91. If the sum of the immediate successors of two given numbers is 40 and the difference of the two given numbers is 6, then the two given numbers are _____
Group D 18/09/2022 (Afternoon)
(a) 24 and 14 (b) 22 and 16
(c) 25 and 13 (d) 22 and 18

Q.92. Two consecutive numbers are such that one-fourth of the smaller number exceeds one-fifth of the larger number by 3. The larger number is _____.
Group D 19/09/2022 (Morning)
(a) 25 (b) 65 (c) 45 (d) 75

Q.93. Which of the following statements is NOT correct ?
1. There are only four single-digit prime numbers.
2. There are infinitely many prime numbers.
3. A prime number has only two factors.
4. All prime numbers are odd.
Group D 20/09/2022 (Morning)
(a) 1 (b) 4 (c) 2 (d) 3

Q.94. Which of the numbers below is divisible by all the natural numbers from 1 to 10 (both inclusive) ?
Group D 20/09/2022 (Afternoon)
(a) 608 (b) 10 (c) 2520 (d) 100

Q.95. If $4^{2n+1} = 2^{3n+9}$, $then\ n =$_____
Group D 20/09/2022 (Evening)
(a) $\frac{9}{2}$ (b) 7 (c) - 8 (d) 8

Q.96. If the sum of three consecutive odd numbers is 309 , then the largest number among them is
Group D 20/09/2022 (Evening)
(a) 105 (b) 101 (c) 103 (d) 109

Q.97. Which of the options below gives a pair of co - prime numbers ?
Group D 26/09/2022 (Evening)
(a) (196, 343) (b) (228, 247)
(c) (161, 192) (d) (156, 234)

Q.98. The 6 - digit number 473xy5 is divisible by 125. How many such 6-digit numbers are there ?
Group D 27/09/2022 (Morning)
(a) 3 (b) 4 (c) 1 (d) 2

Q.99. Which of the following are exactly divisible by 44 ?
Group D 27/09/2022 (Afternoon)
(1) 155232 (2) 155248
(3) 156944 (4) 156992
(a) Only (2) and (3) (b) Only (1) and (4)
(c) Only (1) and (3) (d) Only (2) and (4)

Q.100. Let x = 55^{100} + 55^{101} + 55^{102}. Which of the following prime numbers is NOT a factor of x ?
Group D 27/09/2022 (Evening)
(a) 71 (b) 3 (c) 79 (d) 11

Q.101. When a number is divided by 15, it leaves a remainder of 3. If the same number is divided by 17, the remainder is 11. Which of the options below gives such a number ?
Group D 28/09/2022 (Morning)
(a) 198 (b) 185 (c) 190 (d) 183

Q.102. Mr. Rao walks 45 minutes in a day. What fraction of a day does he walk per day, expressed as a fraction?
Group D 28/09/2022 (Afternoon)
(a) $\frac{3}{4}$ (b) $\frac{1}{80}$ (c) $\frac{1}{24}$ (d) $\frac{1}{32}$

Q.103. Which of the following is divisible by 17 ?
Group D 28/09/2022 (Evening)

(a) 1887 (b) 2989 (c) 991 (d) 2022

Q.104. The difference between two numbers is 18. If the difference between their squares is 360 , find the larger number.
Group D 29/09/2022 (Morning)
(a) 19 (b) 18 (c) 15 (d) 16

Q.105. The average of the first 7 multiples of 3 is:
Group D 29/09/2022 (Morning)
(a) 11.3 (b) 12 (c) 10.5 (d) 12.5

Q.106. This question is based on the seven, three - digit numbers given below.
365 , 125 , 486 , 548 , 654 , 552 , 354
If 3 is added to the first digit of every number, in how many numbers will the first digit be exactly divisible by the second digit? (example - 697 - First digit = 6 , second digit = 9 and third digit = 7)
Group D 29/09/2022 (Evening)
(a) One (b) Three (c) Four (d) Two

Q.107. What is the difference between the biggest and the smallest fractions among $\frac{1}{2}$, $\frac{3}{4}$, $\frac{4}{5}$ and $\frac{5}{6}$?
Group D 29/09/2022 (Evening)
(a) $\frac{1}{12}$ (b) $\frac{1}{3}$ (c) $\frac{1}{9}$ (d) $\frac{1}{6}$

Q.108. Arrange the numbers given below in ascending order.
705.0, 7.005, 7.500, 70.50, 7050, 7.050, 75
Group D 30/09/2022 (Morning)
(a) 7050, 705.0, 75, 70.50, 7.500, 7.050, 7.005
(b) 7.005, 7.500, 7.050, 70.50, 75, 705.0, 7050
(c) 7.005, 7.500, 7.050, 75, 70.50, 705.0, 7050
(d) 7.005, 7.050, 7.500, 70.50, 75, 705.0, 7050

Q.109. In the set {61 , 62...100} , find the sum of the second largest and the second smallest primes.
Group D 30/09/2022 (Afternoon)
(a) 156 (b) 164 (c) 150 (d) 158

Q.110. Find the least number which, when divided by 12 , 16 and 18, leaves a remainder of 5 in each case.
Group D 30/09/2022 (Evening)
(a) 145 (b) 144 (c) 147 (d) 149

Q.111. The sum of three distinct prime numbers is 40. What is the product of these prime numbers ?
Group D 06/10/2022 (Evening)
(a) 310 (b) 682 (c) 722 (d) 434

Q.112. If a number is divisible by 4, then which of the following statements is true?
Group D 06/10/2022 (Evening)
(a) The unit place in the number is 0.
(b) The sum of the digits in the number is divisible by 4.
(c) The number will be divisible by 2 and 6.
(d) The number formed by its last two digit is divisible by 4.

Q.113. Which of the following statements is true ?
Group D 07/10/2022 (Afternoon)
(a) 1 is a prime number.
(b) All prime numbers except the number 2 are odd numbers.
(c) There are seven prime numbers between 1 and 20.
(d) If number x is prime, then number x + 1 is always prime.

Q.114. The least value of x so that the number 478265475x + 25481459x is divisible by 8, is given by:
Group D 07/10/2022 (Afternoon)
(a) x = 1 (b) x = 4 (c) x = 2 (d) x = 3

Q.115. How many integers lie between 891^2 and 892^2 ?
Group D 07/10/2022 (Evening)
(a) 1782 (b) 892 (c) 900 (d) 1784

Q.116. The sum of two consecutive multiples of 8 is 56. The greater of these two multiples is:
Group D 11/10/2022 (Afternoon)
(a) 24 (b) 42 (c) 23 (d) 32

RRB NTPC CBT - 2
(09/05/2022 to 17/06/2022)

Q.117. One - seventh of a 2 - digit number is 15 less than half of the number. What is the sum of the digits of the 2-digit number ?
Level 6 (09/05/2022) Shift 1
(a) 8 (b) 5 (c) 7 (d) 6

Q.118. If the square of a positive number is 6 more than five times the number, what is the number ?
Level 6 (09/05/2022) Shift 2
(a) 6 (b) 8 (c) 5 (d) 9

Q.119. The sum of two numbers is 17 while the sum of their squares is 157. Find the sum of the cubes of those two numbers.
Level 5 (12/06/2022) Shift 1
(a) 3791 (b) 3094 (c) 1491 (d) 1547

Q.120. From $\frac{3}{4}$ of a number P, Ramakrishna subtracts $\frac{2}{3}$ of another number Q and obtain $\frac{5}{8}$ as the difference. What is the answer Ramakrishna should obtain if he subtracts eight times of Q from nine times of P ?
Level 5 (12/06/2022) Shift 2
(a) $\frac{25}{4}$ (b) $\frac{25}{3}$ (c) $\frac{20}{3}$ (d) $\frac{15}{2}$

Q.121. Which of the following numbers is divisible by 7 , 11 and 13 ?
Level 3 (14/06/2022) Shift 1
(a) 1002001 (b) 1003001
(c) 1005001 (d) 1004001

Q.122. In a division involving decimal fractions, the divisor is 22.8 and the quotient is 8.5, while the remainder is 0. What is the dividend?
Level 3 (14/06/2022) Shift 2
(a) 193.2 (b) 193.8 (c) 193.6 (d) 193.4

Q.123. In a bag full of pencils , $\frac{3}{4}$ of the pencils were coloured pencils , and $\frac{8}{15}$ of the coloured pencils were red. If there were 40 red pencils in the bag. What was the total numbers of pencils in the bag ?
Level 5 (15/06/2022) Shift 1
(a) 100 (b) 120 (c) 150 (d) 180

Q.124. If each packet contains the same number of pencils and there are 96 pencils in all in 12 packets, how many packets will one have to purchase if one requires 304 pencils ?
Level 2 (16/06/2022) Shift 2
(a) 39 (b) 38 (c) 36 (d) 33

Q.125. If 13.5 kg of grapes cost Rs 681.75, Find the cost of 12 kg of grapes.
Level 2 (16/06/2022) Shift 2
(a) 606.00 (b) 612.00
(c) 603.00 (d) 610.00

Q.126. If a positive integer n is divided by 7 , then the remainder is 3. Which of the following numbers yields a remainder of 0 when it is divided by 7 ?
Level 2 (16/06/2022) Shift 3
(a) n + 3 (b) n + 4 (c) n + 2 (d) n + 5

Q.127. x and y are in direct proportion and y = 92.5 when x = 37 , what will be the value of y when x = 16 ?
Level 2 (16/06/2022) Shift 3
(a) 48 (b) 32 (c) 40 (d) 24

Q.128. The product of 16 and another number y is 460.8. What will the quotient be when y is divided by 16 ?

Level 3 (17/06/2022) Shift 1
(a) 2.2 (b) 1.7 (c) 1.8 (d) 2.3

Q.129. If a product of 0.225, 0.36 and a number N is 243, then what is the value of number N ?
Level 3 (17/06/2022) Shift 2
(a) 2400 (b) 3300 (c) 3000 (d) 3600

Q.130. Which of the following numbers is divisible completely by both 9 and 11?
Level 3 (17/06/2022) Shift 2
(a) 12345 (b) 277218
(c) 181998 (d) 10098

RRB NTPC CBT - 1 (28/12/2020 to 31/07/2021)

Q.131. What is the unit digit in the following expression 4 × 38 × 764 × 1256
RRB NTPC 28/12/2020 (Morning)
(a) 5 (b) 6 (c) 8 (d) 4

Q.132. For any natural number n, $6^n - 5^n$ always ends with :-
RRB NTPC 28/12/2020 (Evening)
(a) 5 (b) 3 (c) 7 (d) 1

Q.133. The difference between the mean of the first eight composite natural numbers and the mean of the first eight prime numbers, is
RRB NTPC 28/12/2020 (Evening)
(a) $\frac{3}{20}$ (b) $\frac{1}{5}$ (c) $\frac{1}{8}$ (d) $\frac{1}{4}$

Q.134. Find the sum of all the numbers between 100 and 200 which are divisible by 12.
RRB NTPC 29/12/2020 (Morning)
(a) 1600 (b) 1400 (c) 1240 (d) 1200

Q.135. Number 0.232323 can be written in rational form as.
RRB NTPC 30/12/2020 (Morning)
(a) $\frac{23}{99}$ (b) $\frac{23}{990}$ (c) $\frac{23}{999}$ (d) $\frac{23}{9}$

Q.136. In the following expression which number should be added so that it becomes a complete square ?
1 + 3 + 7 + 9 + 11 + 13
RRB NTPC 30/12/2020 (Morning)
(a) 3 (b) 5 (c) 1 (d) 7

Q.137. When a smaller number divides a larger number, we get a quotient of 6 and a remainder of 5. Find the smaller number if the difference between the two numbers is 1540.
RRB NTPC 04/01/2021 (Morning)
(a) 620 (b) 307 (c) 580 (d) 735

Q.138. Find the greatest number of five digits, which is exactly divisible by 468.
RRB NTPC 04/01/2021 (Evening)
(a) 99486 (b) 99468 (c) 99684 (d) 99864

Q.139. If the denominator of a rational number is of the form 2^n5^m, where n and m are non - negative integers, then what will be the decimal expansion of the number ?
RRB NTPC 05/01/2021 (Morning)
(a) Non-terminating and non-recurring
(b) Non-terminating but recurring
(c) Terminating
(d) Can't be determined

Q.140. How many factors of the number 21600 are perfect squares ?
RRB NTPC 05/01/2021 (Morning)
(a) 12 (b) 6 (c) 15 (d) 10

Q.141. Which of the following statements is true ?
RRB NTPC 05/01/2021 (Morning)
(a) Every complex number can be expressed in the form of a real number.
(b) Every integer is a natural number.
(c) Every real number can be written in the complex form.
(d) Every real number is an integer.

Q.142. What fraction of the numbers from 2 to 12 are composite numbers ?
RRB NTPC 05/01/2021 (Evening)
(a) $\frac{6}{11}$ (b) $\frac{5}{11}$ (c) $\frac{10}{11}$ (d) $\frac{1}{11}$

Q.143. A + 0 = 0 + A = A , where A is a real number is true, because of
(a) The commutative property of addition
(b) The additive property of zero
(c) The associative property of addition
(d) The inverse property of addition

Q.144. If the difference between squares of two consecutive positive odd integers is 56, then the two consecutive odd integers are.
RRB NTPC 07/01/2021 (Morning)
(a) 13, 15 (b) 11, 13 (c) 15, 17 (d) 17, 19

Q.145. When a number n is divided by 5 , the remainder is 2. When n^2 is divided by 5, the remainder will be
RRB NTPC 07/01/2021 (Morning)
(a) 3 (b) 0 (c) 4 (d) 1

Q.146. Decimal expansion of $\frac{109}{100}$ is:
RRB NTPC 07/01/2021 (Evening)
(a) $1 + \frac{9}{10}$ (b) $10 + \frac{9}{100}$
(c) $1 + \frac{0}{10} + \frac{9}{100}$ (d) $100 + 9 + \frac{0}{100}$

Q.147. Which of the following numbers has a terminating decimal?
$\frac{15}{600}, \frac{29}{343}, \frac{7}{2^2 \times 7^2}, \frac{77}{210}$
RRB NTPC 07/01/2021 (Evening)
(a) $\frac{77}{210}$ (b) $\frac{29}{343}$ (c) $\frac{15}{600}$ (d) $\frac{7}{2^2 \times 7^2}$

Q.148. The product of any two even consecutive numbers is always divisible by.
RRB NTPC 08/01/2021 (Morning)
(a) 8 (b) 6 (c) 12 (d) 16

Q.149. Three consecutive integers when taken in increasing order and multiplied by 2, 3 and 4 respectively adds up to 74. What is the greater number ?
RRB NTPC 08/01/2021 (Morning)
(a) 9 (b) 8 (c) 14 (d) 10

Q.150. The smallest six digit number which is completely divisible by 4, 8, 12 and 16 is.
RRB NTPC 08/01/2021 (Evening)
(a) 100032 (b) 100700
(c) 100800 (d) 100900

Q.151. $3^{71} + 3^{72} + 3^{73} + 3^{74} + 3^{75}$ is divisible by.
RRB NTPC 08/01/2021 (Evening)
(a) 5 (b) 8 (c) 11 (d) 7

Q.152. If the sum of squares of two positive numbers is 2437 and square root of one number is 7. Find the other number.
RRB NTPC 08/01/2021 (Evening)
(a) 6 (b) 16 (c) 12 (d) 8

Q.153. Express $0.03\overline{7}$ $in\ the\ form\ of\ \frac{p}{q}$, where p is a whole number and q is a natural number.
RRB NTPC 09/01/2021 (Morning)
(a) $\frac{37}{1000}$ (b) $\frac{34}{99}$ (c) $\frac{17}{45}$ (d) $\frac{17}{450}$

Q.154. How many numbers from 3 to 60 are odd numbers that are exactly divisible by 5 ?
RRB NTPC 09/01/2021 (Morning)
(a) 5 (b) 8 (c) 7 (d) 6

Q.155. Sum of the digits of a two-digit number is 6. If the digits are reversed, the new number equals double of the original number decreased by 6. Find the number.
RRB NTPC 09/01/2021 (Morning)
(a) 51 (b) 42 (c) 24 (d) 15

Q.156. How many numbers between 300 and 1000 are divisible by 7 ?
RRB NTPC 09/01/2021 (Morning)
(a) 994 (b) 301 (c) 100 (d) 101

Q.157. The sum of the digits of a two-digit number is 9. If the digits are reversed the new number when increased by 9 equals three times the original number. Find the number.
RRB NTPC 09/01/2021 (Evening)
(a) 27 (b) 72 (c) 54 (d) 45

Q.158. How many numbers greater than 2 and less than 30 are divisible by 1 and themselves ?
RRB NTPC 10/01/2021 (Morning)
(a) 27 (b) 11 (c) 9 (d) 29

Q.159. The sum of all even integers from 2 to 281 is :
RRB NTPC 10/01/2021 (Morning)
(a) 19599 (b) 19458 (c) 19527 (d) 19740

Q.160. Select the option that gives the fractions $\frac{2}{5}, \frac{1}{3}, \frac{3}{5}, \frac{1}{4}, \frac{7}{10}, \frac{5}{8}$, in ascending order.
RRB NTPC 10/01/2021 (Morning)
(a) $\frac{1}{3}, \frac{1}{4}, \frac{2}{5}, \frac{3}{5}, \frac{5}{8}, \frac{7}{10}$
(b) $\frac{1}{4}, \frac{1}{3}, \frac{2}{5}, \frac{3}{5}, \frac{5}{8}, \frac{7}{10}$,
(c) $\frac{1}{4}, \frac{1}{3}, \frac{3}{5}, \frac{2}{5}, \frac{5}{8}, \frac{7}{10}$,
(d) $\frac{7}{10}, \frac{5}{8}, \frac{3}{5}, \frac{2}{5}, \frac{1}{3}, \frac{1}{4}$

Q.161. The smallest of the four consecutive odd numbers having sum 160 is :
RRB NTPC 10/01/2021 (Morning)
(a) 35 (b) 41 (c) 39 (d) 37

Q.162. The sum of the digits of a two-digit number is 5. If the digits are reversed, the new number when increased by 1 equals three times the original number. Find the number.
RRB NTPC 10/01/2021 (Morning)
(a) 14 (b) 41 (c) 32 (d) 23

Q.163. Rs 9,000 is divided exactly among a certain number of students. Had there been 20 more students each would get Rs 160 less. What was the original number of students ?
RRB NTPC 10/01/2021 (Evening)
(a) 35 (b) 20 (c) 25 (d) 30`

Q.164. How many numbers are present between 50 and 100 (both excluding) which contains digit 5 and can be exactly divisible by digit 5 ?
RRB NTPC 10/01/2021 (Evening)
(a) 5 (b) 10 (c) 7 (d) 9

Q.165. A number when divided by 5 leaves a remainder 3. When the square of the same number is divided by 5, then the remainder is:
RRB NTPC 11/01/2021 (Morning)
(a) 5 (b) 3 (c) 2 (d) 4

Q.166. The digit of hundred's place value of 19! Is :
RRB NTPC 12/01/2021 (Morning)
(a) 1 (b) 4 (c) 9 (d) 0

Q.167. The number between 6000 and 7000 that is divisible by each of 12 , 21 , 32 and 18 is :
RRB NTPC 12/01/2021 (Morning)
(a) 6064 (b) 6048 (c) 6480 (d) 6040

Q.168. The least positive number, which must be added to the greatest number of 4 digits in order that the sum may be exactly divisible by 307 , is :
RRB NTPC 12/01/2021 (Morning)
(a) 176 (b) 132 (c) 131 (d) 175

Q.169. The value of 1 + 2 + 3 +. .+ 30 + 31 + 30 + 29 +. . .+ 3 + 2 + 1 = ?
RRB NTPC 12/01/2021 (Evening)
(a) 961 (b) 1000 (c) 999 (d) 900

Q.170. Out of four consecutive numbers, the sum of the first two numbers is equal to the fourth number. What is half of the sum of the four numbers ?
RRB NTPC 12/01/2021 (Evening)
(a) 2 (b) 9 (c) 14 (d) 7

Q.171. Find the sum of the face values of 6 and 5 in 61827354.
RRB NTPC 12/01/2021 (Evening)
(a) 30 (b) 11 (c) 40 (d) 60000300

Q.172. Which of the following numbers, when added to itself 14 times gives 135 as result ?
RRB NTPC 12/01/2021 (Evening)
(a) 9 (b)12 (c) 11 (d) 8

Q.173. The number 1.112123123412345 …….. Is a/an :
RRB NTPC 13/01/2021 (Morning)
(a) irrational number (b) natural number
(c) rational number (d) integer

Q.174. When a number is divided by 45, it leaves a remainder of 28. The remainder when the same number is divided by 15 is.
RRB NTPC 13/01/2021 (Morning)
(a) 13 (b) 12 (c) 11 (d) 10

Q.175. Let N be the greatest number such that when 1300 , 4660 and 6900 are divisible by N, the remainder is the same. The sum of the digits in N is.
RRB NTPC 13/01/2021 (Morning)
(a) 3 (b) 5 (c) 4 (d) 6

Q.176. $\frac{(3\sqrt{5}+\sqrt{125})}{(\sqrt{80}+6\sqrt{5})}$ is..
RRB NTPC 13/01/2021 (Morning)
(a) an irrational number
(b) a rational number
(c) an integer
(d) a natural number

Q.177. One fourth of a number is equal to three - eighth of another number. If 30 is added to the first number, then it becomes six times that of the second number. The first number is:
RRB NTPC 13/01/2021 (Evening)
(a) 10 (b) 12 (c) 15 (d) 20

Q.178. Find the number of terms in the sequence 4, 8, 16, 32, --------512.
RRB NTPC 13/01/2021 (Evening)
(a) 7 (b) 10 (c) 9 (d) 8

Q.179. Calculate the smallest number which should be subtracted from 0.000327 to make it a perfect square.
RRB NTPC 16/01/2021 (Morning)
(a) 0.03 (b) 0.000004
(c) 0.04 (d) 0.000003

Q.180. Which of the following numbers will completely divide $(4^{61} + 4^{62} + 4^{63} + 4^{64})$?
RRB NTPC 16/01/2021 (Morning)
(a) 10 (b) 13 (c) 11 (d) 3

Q.181. A number when divided by 280 leaves 73 as the remainder. When the same number is divided by 35. The remainder will be :
RRB NTPC 16/01/2021 (Morning)
(a) 3 (b) 4 (c) 2 (d) 7

Q.182. If a positive number when decreased by 3, is equal to 28 times the reciprocal of the number, then find the number.
RRB NTPC 16/01/2021 (Morning)
(a) 5 (b) 6 (c) 8 (d) 7

Q.183. The difference of two numbers is 20% of the larger number. If the smaller number is 40, then find the larger number.
RRB NTPC 16/01/2021 (Morning)
(a) 45 (b) 60 (c) 40 (d) 50

Q.184. Find the greatest ratio in the following.
RRB NTPC 16/01/2021 (Morning)
(a) 13 : 21 (b) 5 : 18 (c) 15 : 28 (d) 19 : 27

Q.185. Find the smallest number which must be subtracted from 63535 to make it a perfect square.
RRB NTPC 17/01/2021 (Morning)
(a) 25 (b) 31 (c) 30 (d) 41

Q.186. How many digits will be there to the right of the decimal point on the product of 99.75 and 0.05554 ?
RRB NTPC 17/01/2021 (Morning)
(a) 8 (b) 6 (c) 7 (d) 5

Q.187. The smallest positive number which must be added to the greatest number of 4 digits in order that the sum may be exactly divisible by 307 is:
RRB NTPC 17/01/2021 (Evening)
(a) 306 (b) 176 (c) 132 (d) 307

Q.188. Find the smallest perfect square number which must be added to the number 12519 to get a perfect square number.
RRB NTPC 17/01/2021 (Evening)
(a) 9 (b) 16 (c) 20 (d) 25

Q.189. The number whose only factors are 1 and the number itself is called a/an ____ number.
RRB NTPC 18/01/2021 (Morning)
(a) composite (b) prime
(c) even (d) odd

Q.190. If 111.....1 (n digits) is divisible by 9, then the least value of n is __
RRB NTPC 18/01/2021 (Morning)
(a) 9 (b) 3 (c) 18 (d) 12

Q.191. The sum of the place values of 9 in 96961 is :
RRB NTPC 19/01/2021 (Morning)
(a) 9090 (b) 18 (c) 9000 (d) 90900

Q.192. Find the greatest number of five digits which is exactly divisible by 6 , 8 , 12 , 15 and 20.
RRB NTPC 19/01/2021 (Morning)
(a) 99920 (b) 99960 (c) 99980 (d) 99999

Q.193. A terminating decimal is always:
RRB NTPC 19/01/2021 (Evening)
(a) an integer
(b) a whole number
(c) a rational number
(d) a natural number

Q.194. The decimal expansion of $\frac{31}{2.5}$ will terminate after:
RRB NTPC 19/01/2021 (Evening)
(a) two decimal places
(b) one decimal place
(c) more than three decimal places
(d) three decimal places

Q.195. The product of $4\sqrt{6}$ and $3\sqrt{24}$ is:
RRB NTPC 19/01/2021 (Evening)
(a) a negative number
(b) a prime number
(c) a rational number
(d) an irrational number

Q.196. $(\sqrt{2} - \sqrt{3})^2$ is:
RRB NTPC 19/01/2021 (Evening)
(a) a whole number
(b) a rational number
(c) an irrational number
(d) a natural number

Q.197. The decimal expression of $\frac{3}{8}$ comes to an end after how many digits after the decimal ?
RRB NTPC 20/01/2021 (Morning)
(a) 3 (b) 2 (c) 4 (d) 5

Q.198. $0.\overline{23}$ is :
RRB NTPC 20/01/2021 (Morning)
(a) a prime number
(b) a composite number
(c) a rational number
(d) an irrational number

Q.199. Which of the following is a rational number between $\sqrt{5}$ and $\sqrt{7}$?
RRB NTPC 20/01/2021 (Morning)
(a) $2\frac{2}{5}$ (b) $1\frac{1}{5}$ (c) $3\frac{1}{5}$ (d) $4\frac{1}{5}$

Q.200. The 5th part of a number when divided by 3 yields three times half of tenth part of half of 80. What is the number ?
RRB NTPC 20/01/2021 (Morning)
(a) 44 (b) 60 (c) 90 (d) 45

Q.201. Rationalising factor of $\sqrt[3]{40}$ is:
RRB NTPC 20/01/2021 (Evening)
(a) $10^{\frac{1}{3}}$ (b) $5^{\frac{2}{3}}$ (c) $40^{\frac{1}{3}}$ (d) $2^{\frac{2}{3}}$

Q.202. The greatest prime number less than 200 is:
RRB NTPC 21/01/2021 (Evening)
(a) 199 (b) 191 (c) 197 (d) 193

Q.203. What will be the value if you multiply $\frac{2}{11}$ by the reciprocal of $-\frac{5}{14}$?
RRB NTPC 21/01/2021 (Evening)
(a) $\frac{2}{3}$ (b) $\frac{28}{55}$ (c) $-\frac{28}{55}$ (d) $-\frac{10}{153}$

Q.204. An irrational number between 3 and 5 is:
RRB NTPC 22/01/2021 (Morning)
(a) $\sqrt{17}$ (b) $\sqrt{5}$ (c) $\sqrt{3}$ (d) $\sqrt{27}$

Q.205. Which of the following has terminal decimal representation?
RRB NTPC 22/01/2021 (Morning)
(a) $\frac{2}{7}$ (b) $\frac{2}{5}$ (c) $\frac{2}{3}$ (d) $\frac{2}{9}$

Q.206. Which of the following statements is false ?
RRB NTPC 22/01/2021 (Morning)
(a) There is no largest natural number.
(b) 1 is the smallest natural number.
(c) All natural numbers together with zero are called integers.
(d) There is no largest whole number.

Q.207. How many prime numbers are there that are less than 50 ?
RRB NTPC 22/01/2021 (Evening)
(a) 16 (b) 13 (c) 15 (d) 14

Q.208. Find the place value of 7 in 71,624.
RRB NTPC 23/01/2021 (Morning)
(a) 70,000 (b) 700 (c) 7,000 (d) 7

Q.209. The sum of the four consecutive even numbers is 484. What would the smallest number be ?
RRB NTPC 23/01/2021 (Morning)
(a) 118 (b) 128 (c) 114 (d) 242

Q.210. Find the difference of face values of 9 and 3 in 3,15,298.
RRB NTPC 23/01/2021 (Morning)
(a) 6 (b) 2,99,910 (c) 27 (d) 3,00,090

Q.211. While solving a mathematical problem, Atul squared the initial number and then subtracted 15 from it. Pratul first subtracted 15 from the initial number and then squared the difference. If both obtained the same answer, what was the initial number ?
RRB NTPC 23/01/2021 (Evening)
(a) 8 (b) 6 (c) 9 (d) 7

Q.212. The sum of first 'n' natural numbers is.
RRB NTPC 23/01/2021 (Evening)
(a) $\frac{n(n+1)}{2}$ (b) $\frac{n(n-1)}{2}$
(c) $\frac{n}{2}$ (d) $\frac{n}{2} + 1$

Q.213. If a positive number N, when divided by 5 leaves a remainder 3, then the unit's place digit of N is:
RRB NTPC 25/01/2021 (Morning)
(a) 0 or 2 (b) 0 or 5 (c) 3 or 8 (d) 1 or 5

Q.214. Instead of multiplying a number by 2, Rahul divided it by 2 and got the answer as 2. What should be the actual answer ?
RRB NTPC 25/01/2021 (Morning)
(a) 6 (b) 4 (c) 8 (d) 2

Q.215. How many numbers are there between 200 to 1000 that are completely divisible by 7 ?
RRB NTPC 25/01/2021 (Morning)
(a) 113 (b) 116 (c) 114 (d) 115

Q.216. $(41^{43} + 43^{43})$ is divisible by which

of the following?
RRB NTPC 25/01/2021 (Evening)
(a) 84 (b) 86 (c) 12 (d) 74

Q.217. Find the difference between the place value and face value of 6 in 516372 ?
RRB NTPC 25/01/2021 (Evening)
(a) 5994 (b) 5394 (c) 5998 (d) 6698

Q.218. The difference between the greatest and the smallest number of six digit is :
RRB NTPC 27/01/2021 (Morning)
(a) 109999 (b) 899999
(c) 100000 (d) 895592

Q.219. The largest number of four digits which, when divided by 6, 12 and 18 leaves the same remainder 5 in each case is:
RRB NTPC 27/01/2021 (Morning)
(a) 9977 (b) 9976 (c) 9940 (d) 9978

Q.220. How many numbers lie between the largest three digit number and the largest four digit number which are divisible by 5 ?
RRB NTPC 27/01/2021 (Evening)
(a) 1900 (b) 1700 (c) 1800 (d) 2000

Q.221. How many 3 - digit numbers leave remainder 1 when divided by 7 ?
RRB NTPC 28/01/2021(Morning)
(a) 130 (b) 125 (c) 128 (d) 126

Q.222. The six digit number 87937A is divided by 6 where A is the least natural number. Find the value of A.
RRB NTPC 28/01/2021(Morning)
(a) 8 (b) 4 (c) 6 (d) 2

Q.223. Find the sum of the face values of 8 and 5 in the number 817354.
RRB NTPC 28/01/2021 (Evening)
(a) 17 (b) 800050 (c) 13 (d) 40

Q.224. A number when divided by 7 leaves a remainder 4. What will be the remainder when the square of the same number is divided by 7 :
RRB NTPC 29/01/2021 (Morning)
(a) 3 (b) 1 (c) 4 (d) 2

Q.225. The 10th term of the Arithmetic Progression 2 , 7 , 12 , ... is:
RRB NTPC 29/01/2021 (Morning)
(a) 27 (b) 47 (c) 37 (d) 57

Q.226. What is the place value of 5 in the number 56789214?
RRB NTPC 29/01/2021 (Evening)
(a) 5×10^5 (b) 5×10^7
(c) 5×10^6 (d) 5×10^4

Q.227. When 19^{300} is divided by 20 , find the remainder.
RRB NTPC 29/01/2021 (Evening)
(a) 3 (b) 1 (c) 4 (d) 2

Q.228. How many numbers between 1 and 700 are completely divisible by 17 ?
RRB NTPC 29/01/2021 (Evening)
(a) 45 (b) 46 (c) 42 (d) 41

Q.229. If the sum of two numbers is 30 and the product of 50, then the sum of their reciprocals is:
RRB NTPC 29/01/2021 (Evening)
(a) $\frac{3}{5}$ (b) $\frac{5}{3}$ (c) $\frac{2}{5}$ (d) $\frac{5}{2}$

Q.230. The numerator of a fraction is 5 less than its denominator. If 2 is subtracted from the numerator and 2 is added to the denominator, the fraction becomes $\frac{2}{5}$, Find the original fraction.
RRB NTPC 30/01/2021 (Morning)
(a) $\frac{8}{13}$ (b) $\frac{9}{11}$ (c) $\frac{11}{13}$ (d) $\frac{5}{7}$

Q.231. Find the value of D if 1216 - 32D = DDD is divisible by 8.
RRB NTPC 30/01/2021 (Morning)
(a) 4 (b) 6 (c) 2 (d) 8

Q.232. A seven digit number 67843A2 is divisible by 11 where A is a single digit whole number. Find the value of A.
RRB NTPC 30/01/2021 (Morning)
(a) 7 (b) 0 (c) 6 (d) 8

Q.233. There are two numbers such that the big number is obtained by adding 5 to the other. If the total of the two numbers is 19, find the product of these numbers.
RRB NTPC 30/01/2021 (Evening)
(a) 84 (b) 24 (c) 65 (d) 95

Q.234. A number is greater than 3 but less than 8 , Also, it is greater than 6 but less than 10. The number is:
RRB NTPC 30/01/2021 (Evening)
(a) 6 (b) 7 (c) 8 (d) 5

Q.235. Find the least number by which 6250 should be multiplied, so that it becomes a perfect cube.
RRB NTPC 30/01/2021 (Evening)
(a) 15 (b) 30 (c) 20 (d) 25

Q.236. In four consecutive prime numbers, the product of the last three is 7429 and that of the first three is 4199. The largest of these prime number is:
RRB NTPC 30/01/2021 (Evening)
(a) 37 (b) 29 (c) 23 (d) 13

Q.237. How many factors of $2^7 \times 3^3 \times 5^4 \times 7$ are even ?
RRB NTPC 31/01/2021 (Morning)
(a) 280 (b) 320 (c) 84 (d) 40

Q.238. The square root of 90 will lie between_____.
(a) 9 and 10 (b) 8 and 9
(c) 7 and 8 (d) 10 and 11

Q.239. The lowest value of x which makes $\frac{136}{x-4}$ an integer is:
RRB NTPC 31/01/2021 (Morning)
(a) 72 (b) 140 (c) - 132 (d) - 268

Q.240. The sum of prime numbers between 50 and 60 is ___.
RRB NTPC 31/01/2021 (Morning)
(a) 110 (b) 112 (c) 114 (d) 118

Q.241. Which of the numbers below is NOT a perfect square ?
RRB NTPC 31/01/2021 (Morning)
(a) 16,384 (b) 97,344
(c) 23,102 (d) 41,616

Q.242. How many numbers between 1 and 100 are exactly divisible by 6 and 8 both?
RRB NTPC 31/01/2021 (Evening)
(a) 5 (b) 6 (c) 7 (d) 4

Q.243. Which of the following rational numbers lies between $\frac{1}{4}$ and $\frac{1}{2}$?
RRB NTPC 31/01/2021 (Evening)
(a) $\frac{1}{8}$ (b) $\frac{3}{5}$ (c) $\frac{3}{8}$ (d) $\frac{1}{6}$

Q.244. A number consists of 3 digits whose sum is 18 and the middle digit is equal to the sum of the other two. If the number increases by 297 when its digits are reversed, then what is the number ?
RRB NTPC 01/02/2021 (Morning)
(a) 486 (b) 495 (c) 585 (d) 396

Q.245. Find the smallest 4 - digit number which when divided by 2 , 3 and 5 leaves a remainder of 1 in each case ?
RRB NTPC 01/02/2021 (Morning)
(a) 1001 (b) 1041 (c) 1021 (d) 1091

Q.246. If a positive number is subtracted from its square , we get 812. Find the number.
RRB NTPC 01/02/2021 (Morning)
(a) 25 (b) 23 (c) 27 (d) 29

Q.247. How many factors of $2^2 \times 3^1 \times 5^2 \times 7^1$ are divisible by 50 but not by 100?
RRB NTPC 01/02/2021 (Evening)
(a) 4 (b) 12 (c) 16 (d) 8

Q.248. What is the total number of odd and even divisors of 120, respectively?
RRB NTPC 01/02/2021 (Evening)

(a) 16, 0 (b) 4, 12 (c) 8, 8 (d) 12, 4

Q.249. Arrange the following numbers in their increasing order.
1. -0.96 2. 0.83 3. 0.24 4. -0.64 5. 0.58
RRB NTPC 01/02/2021 (Evening)
(a) 3, 5, 4, 2, 1 (b) 2, 5, 3, 4, 1
(c) 4, 1, 3, 5, 2 (d) 1, 4, 3, 5, 2

Q.250. How many numbers less than 10000 are there which are exactly divisible by 21, 35 and 63?
RRB NTPC 02/02/2021 (Morning)
(a) 32 (b) 30 (c) 34 (d) 31

Q.251. How many factors of $2^3 \times 3^3 \times 5^4 \times 7^2$ are divisible by 50 but not by 100 ?
RRB NTPC 02/02/2021 (Evening)
(a) 42 (b) 40 (c) 36 (d) 38

Q.252. What is the number of divisors of 120 ?
RRB NTPC 02/02/2021 (Evening)
(a) 16 (b) 19 (c) 15 (d) 17

Q.253. In a division sum, the divisor is 2 times the quotient and 6 times the remainder. If the remainder is 8 , find out the value of the dividend.
RRB NTPC 03/02/2021 (Morning)
(a) 1160 (b) 408 (c) 240 (d) 840

Q.254. Find the number whose four-fifth is more than its three fourth by 4.
RRB NTPC 03/02/2021 (Evening)
(a) 70 (b) 80 (c) 100 (d) 90

Q.255. The sum of two numbers is 40 and their product is 60. The sum of their reciprocal is:
RRB NTPC 04/02/2021 (Morning)
(a) $\frac{1}{2}$ (b) $\frac{2}{3}$ (c) $\frac{3}{2}$ (d) $\frac{3}{4}$

Q.256. What is the sum of the cubes of the natural numbers from 5 to 14 ?
RRB NTPC 04/02/2021 (Morning)
(a) 10920 (b) 10925 (c) 10930 (d) 10935

Q.257. What is the smallest five - digit number formed by using the digits 2 , 3 , 4 , 0 , 5 ?
RRB NTPC 04/02/2021 (Morning)
(a) 20345 (b) 23045 (c) 20435 (d) 02345

Q.258. The difference between the greatest and the smallest six - digit number is :
RRB NTPC 04/02/2021 (Morning)
(a) 888888 (b) 899999
(c) 988888 (d) 999999

Q.259. If $a^2 + b^2 + c^2 + d^2 = 1$, what will be the maximum value of the product abcd?
RRB NTPC 04/02/2021 (Evening)
(a) $\frac{1}{16}$ (b) 16 (c) $\frac{1}{64}$ (d) 64

Q.260. If the largest 4-digit number is subtracted from the smallest 6-digit number, then the remainder will be.
RRB NTPC 04/02/2021 (Evening)
(a) 90001 (b) 90000 (c) 99991 (d) 80001

Q.261. If the numbers from 1 to 26 that are divisible by 2 are arranged in descending order, which number will be at the 9th place from the bottom ?
RRB NTPC 04/02/2021 (Evening)
(a) 18 (b) 14 (c) 16 (d) 20

Q.262. What is the sum of the squares of the numbers from 1 to 12 ?
RRB NTPC 04/02/2021 (Evening)
(a) 665 (b) 655 (c) 660 (d) 650

Q.263. Find the square root of 42.25.
RRB NTPC 05/02/2021 (Morning)
(a) 6.5 (b) 7.5 (c) 4.5 (d) 5.5

Q.264. The decimal representation of $\frac{5}{100} + \frac{2}{5} - \frac{6}{25}$ is:
RRB NTPC 05/02/2021 (Morning)
(a) 0.45 (b) 0.21 (c) 0.51 (d) 0.35

Q.265. How many of the integers between 109 and 121, both inclusive, are prime numbers ?
RRB NTPC 08/02/2021 (Morning)
(a) 3 (b) 1 (c) 2 (d) 0

Q.266. The sum of the greatest and smallest numbers of six digits is:
RRB NTPC 08/02/2021 (Morning)
(a) 199999 (b) 100000
(c) 1099999 (d) 999999

Q.267. On dividing 15,971 by a certain number, the quotient is 55 and the remainder is 21. Find the divisor.
RRB NTPC 08/02/2021 (Morning)
(a) 275 (b) 285 (c) 290 (d) 280

Q.268. What is the smallest four digit number formed by using the digits 3 , 5 , 0 , 6 ?
RRB NTPC 08/02/2021 (Morning)
(a) 3506 (b) 0536 (c) 0356 (d) 3056

Q.269. What is the sum of the cube of the natural numbers from 1 to 10, both inclusive ?
RRB NTPC 08/02/2021 (Morning)
(a) 3023 (b) 3025 (c) 3024 (d) 3022

Q.270. If 58 out of 100 students in a school are boys, then express the part of the school that consists of boys in decimal.
RRB NTPC 08/02/2021 (Evening)
(a) 0.58 (b) 0.85 (c) 0.8 (d) 0.5

Q.271. Find the ninth term of an arithmetic progression with the first term as 5 and the common difference as 4.
RRB NTPC 08/02/2021 (Evening)
(a) 35 (b) 39 (c) 37 (d) 41

Q.272. Consider the following statements and decide which of them are correct.
(1) Every prime number is odd.
(2) Product of any two prime numbers is odd
RRB NTPC 09/02/2021 (Morning)
(a) 1 and 2 (b) 2 alone
(c) Neither 1 nor 2 (d) 1 alone

Q.273. An Army General wishes to arrange his 40125 soldiers in rows and columns in the form of a square. After arranging them, he found that some of them are left out. How many soldiers are left out ?
RRB NTPC 09/02/2021 (Morning)
(a) 175 (b) 125 (c) 200 (d) 150

Q.274. Which of the following statement(s) is/are true.
(1) Every whole number is a natural number.
(2) Every integer is a rational number.
(3) Every rational number is an integer.
RRB NTPC 09/02/2021 (Morning)
(a) Both 2 and 3 (b) 2 (c) 3 (d) 1

Q.275. In a five digit number, the digit in the hundred's place is 2 and the digit in the unit's place is twice the digit in the hundred's place. The number has no thousands. The digit in the ten thousand's place is the sum of the digit in the hundred's place and the digit in the unit's place. The digit in the ten's place is the digit in the ten thousand's place minus 1. The number is:
RRB NTPC 09/02/2021 (Morning)
(a) 60254 (b) 60264 (c) 60234 (d) 60224

Q.276. The least number by which 294 must be multiplied to make it a perfect square is:
RRB NTPC 09/02/2021 (Morning)
(a) 1 (b) 3 (c) 4 (d) 6

Q.277. What is the value of the digits A and B?
BA x B3 = 57A
RRB NTPC 09/02/2021 (Morning)
(a) A = 5, B = 2 (b) A = 5, B = 3
(c) A = 3, B = 5 (d) A = 2, B = 4

Q.278. What is the unit digit in the following product?
91 × 92 × 93 × .....× 99

RRB NTPC 09/02/2021 (Evening)
(a) 1 (b) 2 (c) 0 (d) 4

Q.279. If the numbers divisible by 3, from 1 to 30, are arranged in descending order, which number will be at the 7th place from the bottom?
RRB NTPC 09/02/2021 (Evening)
(a) 18 (b) 24 (c) 27 (d) 21

Q.280. What is the sum of the squares of the numbers from 3 to 18?
RRB NTPC 09/02/2021 (Evening)
(a) 2102 (b) 2104 (c) 2103 (d) 2101

Q.281. Find the sum of the smallest and the largest positive numbers of 6 digits which contain only digits 0, 4, 6 and each of these digits appears at least once.
RRB NTPC 09/02/2021 (Evening)
(a) 1066646 (b) 604604
(c) 666666 (d) 666444

Q.282. To a number $(\frac{1}{3} - \frac{1}{4})$ is added. From the sum so obtained $\frac{1}{3}$ of $\frac{1}{4}$ is subtracted and the remainder is $\frac{1}{3}+, \frac{1}{4}$ Find the number.
RRB NTPC 10/02/2021 (Morning)
(a) $\frac{2}{3}$ (b) $\frac{7}{12}$ (c) $\frac{1}{12}$ (d) $\frac{4}{9}$

Q.283. Find the smallest natural number N such that the product 288 × N is a perfect cube.
RRB NTPC 10/02/2021 (Morning)
(a) 8 (b) 9 (c) 12 (d) 6

Q.284. Find the sum of all even natural numbers less than 85.
RRB NTPC 10/02/2021 (Evening)
(a) 840 (b) 1806 (c) 1408 (d) 4700

Q.285. Which of the following is equal to 3.14×10^6 ?
RRB NTPC 10/02/2021 (Evening)
(a) 3140000 (b) 314000
(c) 3140 (d) 31.40000

Q.286. A number, x, when divided by 7 leaves a remainder of 1 and another number, y, when divided by 7 leaves a remainder of 2. What will be the remainder if x + y is divided by 7?
RRB NTPC 10/02/2021 (Evening)
(a) 3 (b) 4 (c) 1 (d) 2

Q.287. Find the greatest four-digit number that is a perfect square.
RRB NTPC 10/02/2021 (Evening)
(a) 9801 (b) 9999 (c) 9000 (d) 9008

Q.288. Out of six consecutive numbers, the sum of the first three numbers is 27. What is the sum of the next three numbers?
RRB NTPC 11/02/2021 (Morning)
(a) 12 (b) 63 (c) 36 (d) 10

Q.289. The value of $\frac{1}{4} + \frac{1}{4\times5} + \frac{1}{4\times5\times6}$ correct to four decimal places is.
RRB NTPC 11/02/2021 (Morning)
(a) 0.3092 (b) 0.3083
(c) 0.3150 (d) 0.3140

Q.290. How many significant digits are there to the right of the decimal point in the product of 95.75 and 0.02554?
RRB NTPC 11/02/2021 (Morning)
(a) 4 (b) 5 (c) 3 (d) 6

Q.291. A boy was asked to multiply a given number with $\frac{5}{11}$, instead, he divided the same number by $\frac{5}{11}$. Thus, his answer exceeded the correct answer by 192. What is the given number?
RRB NTPC 11/02/2021 (Morning)
(a) 192 (b) $\frac{110}{5}$ (c) 50 (d) 110

Q.292. Find the correct expression for $5.\overline{46}$ in the fractional form.
RRB NTPC 11/02/2021 (Evening)
(a) $\frac{541}{99}$ (b) $\frac{541}{900}$ (c) $\frac{546}{99}$ (d) $\frac{541}{100}$

Q.293. How many numbers between 500 and 700 are divisible by 11?
RRB NTPC 11/02/2021 (Evening)
(a) 63 (b) 18 (c) 108 (d) 45

Q.294. The tenth term of the sequence 2, 5, 8, 11,..... Will be:
RRB NTPC 11/02/2021 (Evening)
(a) 28 (b) 29 (c) 32 (d) 27

Q.295. The sum of squares of the first ten natural numbers is:
RRB NTPC 11/02/2021 (Evening)
(a) 300 (b) 55 (c) 385 (d) 380

Q.296. Solve the following .
1 - 1 + 1 - 1 + 1 - 1 + … … … (101 times)= ?
RRB NTPC 12/02/2021 (Morning)
(a) 1 (b) 0 (c) -1 (d) 100

Q.297. The product of first five whole numbers is:
RRB NTPC 12/02/2021 (Morning)
(a) 10 (b) 0 (c) 120 (d) -120

Q.298. What fraction of 1275 is 816?
RRB NTPC 12/02/2021 (Morning)
(a) $\frac{48}{72}$ (b) $\frac{16}{24}$ (c) $\frac{16}{25}$ (d) $\frac{48}{75}$

Q.299. 42 x (4 + 2) = (42 x 4) + (42 x 2) is an example of :
RRB NTPC 12/02/2021 (Morning)
(a) closure property
(b) distributive property
(c) identity property
(d) associative property

Q.300. Select the option that expresses $5.\overline{6}$ as a fraction.
RRB NTPC 15/02/2021 (Morning)
(a) $\frac{61}{90}$ (b) $\frac{51}{90}$ (c) $\frac{57}{90}$ (d) $\frac{50}{90}$

Q.301.The square root of 18769 consists of how many digits?
RRB NTPC 15/02/2021 (Morning)
(a) 4 (b) 3 (c) 5 (d) 2

Q.302. The sum of the first 12 multiples of 6 is:
RRB NTPC 15/02/2021 (Morning)
(a) 648 (b) 844 (c) 468 (d) 546

Q.303. Arrange the given fractions in decreasing order.
$\frac{7}{8}, \frac{8}{9}, \frac{9}{10}$
RRB NTPC 15/02/2021 (Morning)
(a) $\frac{7}{8}, \frac{8}{9}, \frac{9}{10}$ (b) $\frac{8}{9}, \frac{7}{8}, \frac{9}{10}$
(c) $\frac{9}{10}, \frac{7}{8}, \frac{8}{9}$ (d) $\frac{9}{10}, \frac{8}{9}, \frac{7}{8}$

Q.304. The remainder in the expression $27\frac{3}{4}$ *is*:
RRB NTPC 15/02/2021 (Morning)
(a) 3 (b) 6 (c) 8 (d) 4

Q.305. The sum of two numbers is 20 and the difference between their squares is 80. Select the two numbers from the given options.
RRB NTPC 15/02/2021 (Morning)
(a) 15,5 (b) 11,9 (c) 13,7 (d) 12,8

Q.306. Find the two-digit number such that the sum of its digits is 8 and the digits of the number get reversed, when 36 is added to it?
RRB NTPC 15/02/2021 (Evening)
(a) 35 (b) 26 (c) 71 (d) 62

Q.307. If the sum of five consecutive multiples of 2 is 660, then find the larger number.
RRB NTPC 15/02/2021 (Evening)
(a) 125 (b) 162 (c) 130 (d) 136

Q.308. Calculate the positive number which when added by 15 is equal to 100 times the reciprocal of a number.

RRB NTPC 15/02/2021 (Evening)
(a) 10 (b) 20 (c) 5 (d) 15

Q.309. Find the value of r such that the mean of the first r odd natural numbers is $\frac{r^2}{16}$
RRB NTPC 15/02/2021 (Evening)
(a) 16 (b) 18 (c) 9 (d) 27

Q.310. What is the difference between the biggest and the smallest fraction among
$\frac{2}{3}, \frac{3}{4}, \frac{4}{5}$, and $\frac{5}{6}$?
RRB NTPC 15/02/2021 (Evening)
(a) $\frac{1}{20}$ (b) $\frac{1}{30}$ (c) $\frac{1}{12}$ (d) $\frac{1}{6}$

Q.311. The sum of the first 20 terms of the series $\frac{1}{5\times6}+\frac{1}{6\times7}+\frac{1}{7\times8}+$..... is:
RRB NTPC 15/02/2021 (Evening)
(a) 1.6 (b) 16 (c) 0.016 (d) 0.16

Q.312. If the sum of two numbers is 24 and the difference between them is 10. Then what is the value of two times the product of the numbers?
RRB NTPC 16/02/2021 (Morning)
(a) 328 (b) 239 (c) 238 (d) 832

Q.313. What is the sum of the first 12 multiples of 4?
RRB NTPC 16/02/2021 (Morning)
(a) 316 (b) 312 (c) 324 (d) 308

Q.314. The value of the expression $(1+\frac{1}{3})(1+\frac{1}{4})(1+\frac{1}{5})$ .....$(1+\frac{1}{n-1})$ is:
RRB NTPC 16/02/2021 (Evening)
(a) $\frac{n}{3}$ (b) $\frac{1}{3}$ (c) $(1+\frac{1}{n})$ (d) $(\frac{n}{n-1})$

Q.315. Which of the following numbers is NOT prime?
RRB NTPC 16/02/2021 (Evening)
(a) 811 (b) 317 (c) 817 (d) 313

Q.316. What would be the highest value of X in the given equation?
5X1 + 6Y7 + 3Z3 = 1471
RRB NTPC 16/02/2021 (Evening)
(a) 5 (b) 3 (c) 6 (d) 7

Q.317. When 25^{25} is divided by 26, then the remainder is.
RRB NTPC 17/02/2021 (Morning)
(a) 25 (b) 24 (c) 2 (d) 1

Q.318. The value of the largest four digit perfect square number divided by the smallest four digit perfect square number will be.
RRB NTPC 17/02/2021 (Morning)
(a) More than 10 (b) Equal to 9
(c) Equal to 10 (d) Less than 10

Q.319. Find the digit in the unit's place of $124^n + 124^{(n+1)}$, where n is any whole number:
RRB NTPC 17/02/2021 (Evening)
(a) 0 (b) 4 (c) 2 (d) 8

Q.320. What is the sum of the two smallest natural numbers, each of the two having exactly seven factors?
RRB NTPC 17/02/2021 (Evening)
(a) 843 (b) 736 (c) 625 (d) 793

Q.321. A school collected Rs.2,601 as fees from its students. If the fees paid by each student and the number of students in the school were equal, then how many students were there in the school?
RRB NTPC 22/02/2021 (Morning)
(a) 39 (b) 49 (c) 61 (d) 51

Q.322. There are two numbers with the difference of 14 between them and the difference of their squares is 56. What are those numbers?
RRB NTPC 22/02/2021 (Morning)
(a) 9, -5 (b) 3, 17 (c) 2, 16 (d) 23, -9

Q.323. The difference between the squares of two numbers is 39 and the sum of these two numbers is 13. What are those numbers?
RRB NTPC 22/02/2021 (Evening)
(a) 4, 3 (b) 10, 3 (c) 8, 5 (d) 7, 6

Q.324. 4^7 - 4 is NOT a multiple of:
RRB NTPC 23/02/2021 (Morning)
(a) 4 (b) 8 (c) 7 (d) 2

Q.325. Two numbers are such that the sum of $\frac{1}{3}$ of the first number and $\frac{1}{2}$ of the second number is 8. The sum of $\frac{1}{5}$of the first number and $\frac{1}{6}$ of the second number is 4. What is the largest of the two numbers?
RRB NTPC 23/02/2021 (Morning)
(a) 11 (b) 6 (c) 21 (d) 15

Q.326. What is the sum of the first 25 odd numbers?
RRB NTPC 23/02/2021 (Morning)
(a) 144 (b) 250 (c) 625 (d) 150

Q.327. What is the sum of the square of all two - digit numbers each of which is completely divisible by 4?
RRB NTPC 27/02/2021 (Morning)
(a) 78300 (b) 78324 (c) 78320 (d) 78220

Q.328. A boy read three-eighth of a book on one day and four-fifth of the remainder of the book on the next day. If 45 pages still remain unread, how many pages does the book contain?
RRB NTPC 27/02/2021 (Morning)
(a) 380 (b) 330 (c) 360 (d) 340

Q.329. The reciprocal of the sum of the reciprocals of $\frac{5}{7}$ and $\frac{9}{5}$ is :
RRB NTPC 27/02/2021 (Morning)
(a) $\frac{88}{35}$ (b) $\frac{88}{45}$ (c) $\frac{45}{88}$ (d) $\frac{35}{88}$

Q.330. Which one of the following numbers is not a prime number?
RRB NTPC 27/02/2021 (Evening)
(a) 231 (b) 313 (c) 211 (d) 241

Q.331. A pillar is divided into three parts. The first part is $\frac{1}{4}$ of the whole, second part is $\frac{4}{8}$ of the first, and the third is 10 m. The length of the pillar is:
RRB NTPC 01/03/2021 (Morning)
(a) 20 m (b) 18 m (c) 16 m (d) 22 m

Q.332. The sum of all odd numbers between 0 and 52 is:
RRB NTPC 01/03/2021 (Morning)
(a) 576 (b) 625 (c) 729 (d) 676

Q.333. After adding 7 to a number, the sum is multiplied by 5, and the product obtained is divided by 9. From the quotient so obtained, 3 is subtracted to get 12. The number is:
RRB NTPC 01/03/2021 (Morning)
(a) 40 (b) 20 (c) 60 (d) 30

Q.334. The numerator of a fraction is less than its denominator by 2. If we subtract 2 from the numerator and add 2 to the denominator, then the new fraction is $\frac{1}{3}$. What is the original fraction?
RRB NTPC 01/03/2021 (Morning)
(a) $\frac{1}{3}$ (b) $\frac{3}{7}$ (c) $\frac{5}{9}$ (d) $\frac{5}{7}$

Q.335. What would be the highest value of X in the given equation?
4X1 + 5Y3 + 2Z7 = 1181
RRB NTPC 01/03/2021 (Evening)
(a) 3 (b) 7 (c) 4 (d) 5

Q.336. Which of the following is a common factor of:
$(89^{89}+87^{89})$ and $(89^{97}+87^{97})$.
RRB NTPC 01/03/2021 (Evening)
(a) 176 (b) 178 (c) 186 (d) 174

Q.337. Find the third term in a sequence of positive numbers that will leave remainders 1, 2 and 5 when divided by 2, 3, and 6 respectively.
RRB NTPC 01/03/2021 (Evening)
(a) 11 (b) 23 (c) 17 (d) 29

Q.338. The difference between the place values of 2 and 3 in the number 128935 is
RRB NTPC 02/03/2021 (Morning)
(a) 30 (b) 300 (c) 20000 (d) 19970

Q.339. The sum of the three consecutive natural numbers is 120. Find the largest number.
RRB NTPC 02/03/2021 (Morning)
(a) 39 (b) 37 (c) 41 (d) 117

Q.340. Which of the following numbers is prime?
RRB NTPC 02/03/2021 (Evening)
(a) 323 (b) 513 (c) 715 (d) 571

Q.341. Which of the following rational numbers lies between 9.2 and 10.5?
RRB NTPC 03/03/2021 (Morning)
(a) 10.67(b) 9.08 (c) 9.15 (d) 9.55

Q.342. The cost of 10 pencils and 12 pens is Rs. 150. What is the cost of 30 pencils and 36 pens?
RRB NTPC 03/03/2021 (Morning)
(a) 600 (b) 450 (c) 200 (d) 300

Q.343. One-fourth of one-eighth of a number is 300. What is one-fifth of the same number?
RRB NTPC 03/03/2021 (Morning)
(a) 1900 (b) 1910 (c) 1890 (d) 1920

Q.344. The least multiple of 7 which when divided by 8, 12 and 16 leaves 3 as remainder in each case.
RRB NTPC 03/03/2021 (Evening)
(a) 48 (b) 70 (c) 56 (d) 147

Q.345. How many decimal numbers can be found between 0.225 and 0.227?
RRB NTPC 03/03/2021 (Evening)
(a) Infinitely many (b) 226 (c) 1 (d) 2

Q.346. Three prime numbers are arranged in descending order . If the product of the first two is 323 and that of the last two is 221, then what is the value of the biggest prime number?
RRB NTPC 04/03/2021 (Morning)
(a) 13 (b) 19 (c) 23 (d) 17

Q.347. The product of the first six even numbers is:
RRB NTPC 05/03/2021 (Evening)
(a) 46020 (b) 46080 (c) 46060 (d) 46800

Q.348. If the number 2893#$ is divisible by 8 and 5, then the digits that would come in the place of # and $, respectively, are:
RRB NTPC 07/03/2021 (Evening)
(a) 2,0 (b) 0,0 (c) 2,2 (d) 0,2

Q.349. Find the smallest whole number whose 60% is more than 6.
RRB NTPC 08/03/2021 (Morning)
(a) 7 (b) 6 (c) 10 (d) 11

Q.350. What is the least number which when added to 1000 gives a number exactly divisible by 15?
RRB NTPC 09/03/2021 (Evening)
(a) 7 (b) 8 (c) 6 (d) 5

Q.351. Find the value of the given series of numbers.
25 + 26 +.....+ 75 = ?
RRB NTPC 11/03/2021 (Evening)
(a) 2525 (b) 2750 (c) 2550 (d) 2755

Q.352. Find the value of the following.
$\frac{1}{1\times 2}+\frac{1}{2\times 3}+\ldots\ldots\ldots+\frac{1}{99\times 100}$
RRB NTPC 12/03/2021 (Morning)
(a) 0.95 (b) 0.92 (c) 0.99 (d) 0.29

Q.353. The sum of three numbers is 253. If the first number be twice the second and third number be one-third of the first, then the second number is:
RRB NTPC 12/03/2021 (Evening)
(a) 84 (b) 48 (c) 69 (d) 54

Q.354. Find the value of $21^2+22^2+23^2+\ldots\ldots+30^2$
RRB NTPC 12/03/2021 (Evening)
(a) 6855 (b) 6585 (c) 5865 (d) 8565

Q.355. The sum of two numbers is 10 and the difference in their squares is 60. What are the two numbers?
RRB NTPC 12/03/2021 (Evening)
(a) 5 and 5 (b) 8 and 2
(c) 7 and 3 (d) 6 and 4

Q.356. Find the least positive integer such that its square is greater than 5 times of the integer by -6.
RRB NTPC 12/03/2021 (Evening)
(a) 3 (b) 4 (c) 5 (d) 2

Q.357. If the number 2564$4 is exactly divisible by 4, then which of the following digit cannot be in the place of $?
RRB NTPC 13/03/2021 (Morning)
(a) 2 (b) 6 (c) 8 (d) 5

Q.358. What will be the remainder when 17^{200} is divided by 18?
RRB NTPC 14/03/2021 (Evening)
(a) 1 (b) 16 (c) 2 (d) 17

Q.359. What is the difference between the largest and the smallest single-digit prime numbers?
RRB NTPC 19/03/2021 (Morning)
(a) 8 (b) 6 (c) 5 (d) 7

Q.360. The least number that should be subtracted from 0.000845 to make it a perfect square is:
RRB NTPC 19/03/2021 (Morning)
(a) 0.000004 (b) 0.000001
(c) 0.000006 (d) 0.000005

Q.361. Find the units digit in the product of $(127)^{153}\times(341)^{89}$.
RRB NTPC 19/03/2021 (Evening)
(a) 5 (b) 3 (c) 4 (d) 7

Q.362. Find the least multiple of 13, which on dividing by 4, 5,6,7, and 8 leaves a remainder 2 in each case.
RRB NTPC 19/03/2021 (Evening)
(a) 2824 (b) 2522 (c) 2142 (d) 2422

Q.363. How many 3-digit numbers are divisible by 7?
RRB NTPC 21/03/2021 (Morning)
(a) 126 (b) 128 (c) 125 (d) 130

Q.364. $6^{61}+6^{62}+6^{63}+6^{64}+6^{65}$ is completely divisible by:
RRB NTPC 21/03/2021 (Morning)
(a) 17 (b) 13 (c) 11 (d) 15

Q.365. Find the least number that, when divided by 72, 80 and 88, leaves the remainder 52, 60, 68 respectively.
RRB NTPC 21/03/2021 (Morning)
(a) 7940 (b) 7900 (c) 7930 (d) 7920

Q.366. How many numbers between 100 and 300 are divisible by 7?
RRB NTPC 21/03/2021 (Evening)
(a) 30 (b) 28 (c) 27 (d) 29

Q.367. Kunal was asked to find $\frac{5}{6}$ times of a number. He multiplied it by $\frac{6}{5}$, As a result, he got an answer which was more than the correct answer by 572. The number was:
RRB NTPC 21/03/2021 (Evening)
(a) 2860 (b) 5720 (c) 1560 (d) 2160

Q.368. The greatest number of four digits which is divisible by 5, 35, 39 and 65 is:
RRB NTPC 21/03/2021 (Evening)
(a) 9994 (b) 9505 (c) 9055 (d) 9555

Q.369. Which of the following is a rational number?
RRB NTPC 27/03/2021 (Morning)

(a) $(\sqrt{2} + \sqrt{5})^2$ (b) $2 + \sqrt{5}$

(c) $2 - \sqrt{5}$ (d) $(\sqrt{2} + \frac{1}{\sqrt{8}})^2$

Q.370. Find the greatest number which divides 285 and 1249 leaving remainders 9 and 7 respectively.
RRB NTPC 27/03/2021 (Morning)
(a) 140 (b) 138 (c) 130 (d) 141

Q.371. When the positive integer K is divided by 18, the remainder is 9. What is the remainder when K is divided by 6?
RRB NTPC 27/03/2021 (Evening)
(a) 4 (b) 3 (c) 2 (d) 1

Q.372. Find the least multiple of 7 which when divided by 6, 8 and 12 leaves 1 as the remainder.
RRB NTPC 01/04/2021 (Morning)
(a) 25 (b) 49 (c) 73 (d) 169

Q.373. If X is a least number with which you multiply 588 so that the product becomes a perfect square, then the value of X is _____.
RRB NTPC 01/04/2021 (Evening)
(a) 1 (b) 2 (c) 5 (d) 3

Q.374. The sum of the prime numbers between the integer greater than 8 and less than 59 is_____.
RRB NTPC 03/04/2021 (Morning)
(a) 364 (b) 365 (c) 359 (d) 361

Q.375. How many prime numbers exist in the factorisation of $6^7 \times 35^3 \times 11^{10}$?
RRB NTPC 03/04/2021 (Evening)
(a) 20 (b) 30 (c) 25 (d) 15

Q.376. What should be added to $\frac{3}{5}$ to obtain number equal to its reciprocal?
RRB NTPC 03/04/2021 (Evening)
(a) $\frac{2}{5}$ (b) $\frac{34}{15}$ (c) $\frac{16}{15}$ (d) $\frac{8}{15}$

Q.377. What is the number of single-digit prime numbers?
RRB NTPC 03/04/2021 (Evening)
(a) 4 (b) 3 (c) 5 (d) 7

Q.378. The sum of the square of the first ten natural numbers is:
RRB NTPC 05/04/2021 (Morning)
(a) 3025 (b) 5050 (c) 385 (d) 55

Q.379. If n is a natural number, then $n^3 - n$ is always divisible by _____.
RRB NTPC 05/04/2021 (Evening)
(a) 4 (b) 6 (c) 5 (d) 8

Q.380. The product of two positive numbers is 972 and their quotient is $\frac{4}{3}$.
The numbers are:
RRB NTPC 06/04/2021 (Morning)
(a) 26 and 27 (b) 36 and 27
(c) 26 and 36 (d) 46 and 56

Q.381. The negative of a non-zero rational number is:
RRB NTPC 06/04/2021 (Morning)
(a) surd
(b) zero
(c) a rational number
(d) an irrational number

Q.382. The largest four-digit number which is exactly divisible by 77 is:
RRB NTPC 06/04/2021 (Morning)
(a) 6993 (b) 9933 (c) 9977 (d) 9693

Q.383. The least multiple of 14 which when divided by 6, 8, 12 leaves remainder 4, 6 and 10 respectively, is:
RRB NTPC 06/04/2021 (Evening)
(a) 40 (b) 46 (c) 70 (d) 336

Q.384. For a given fraction, how many equivalent fractions can be formed?
RRB NTPC 06/04/2021 (Evening)
(a) Infinite (b) Only 2 (c) Only 3 (d) Only 1

Q.385. The number that should be subtracted from 510 and 270 to get 24 as the GCD is:
RRB NTPC 07/04/2021 (Morning)
(a) 16 (b) 42 (c) 24 (d) 6

Q.386. $119^2 - 111^2 is\ a\ /an$:
RRB NTPC 07/04/2021 (Evening)
(a) Square number (b) Perfect number
(c) Prime number (d) Composite number

Q.387. If pq is a two-digit number , then pq-qp will be completely divisible by:
RRB NTPC 07/04/2021 (Evening)
(a) 9 (b) 7 (c) 6 (d) 5

Q.388. Which of the following is INCORRECT?
RRB NTPC 07/04/2021 (Evening)
(a) 1 is the multiplicative identity of rational numbers.
(b) Commutative property holds in the set of natural numbers under addition.
(c) Every rational number is a whole number.
(d) Reciprocal of 1 is 1.

Q.389. The sum of two numbers is 15. If the sum of their reciprocals is $\frac{3}{10}$, then find the two numbers?
RRB NTPC 07/04/2021 (Evening)
(a) 7, 8 (b) 5, 10 (c) 6,9 (d) -5 , 20

Q.390. If x is any positive even number, then $x^{65} - x$ will always be divisible by:
RRB NTPC 08/04/2021 (Morning)
(a) 6 (b) 10 (c) 8 (d) 12

Q.391. One-third of the sum of all the prime numbers greater than 5 but less than 18 is the square of:
RRB NTPC 08/04/2021 (Morning)
(a) 5 (b) 4 (c) 3 (d) 6

Q.392. What is the sum of the cubes of the first four natural numbers?
RRB NTPC 23/07/2021 (Morning)
(a) 1000 (b) 84 (c) 9 (d) 100

Q.393. What is the value of 101^3?
RRB NTPC 23/07/2021 (Morning)
(a) 1020301 (b) 1030201
(c) 1030301 (d) 1020201

Q.394. How many factors does the number 12288 have?
RRB NTPC 23/07/2021 (Morning)
(a) 22 (b) 24 (c) 28 (d) 26

Q.395. The greatest number among - $\frac{3}{2}$, $-\frac{3}{2}$, $\frac{11}{4}$, $\frac{5}{2}$ is:
RRB NTPC 23/07/2021 (Evening)
(a) $-\frac{3}{2}$ (b) $\frac{11}{4}$ (c) $\frac{5}{2}$ (d) $\frac{3}{2}$

Q.396. The smallest three - digit prime number is:
RRB NTPC 23/07/2021 (Evening)
(a) 109 (b) 103 (c) 101 (d) 107

Q.397. Which two fractions can be inserted between $\frac{5}{7}$ and $\frac{3}{4}$.
RRB NTPC 23/07/2021 (Evening)
(a) $\frac{8}{11}, \frac{11}{15}$ (b) $\frac{2}{3}, \frac{5}{6}$
(c) $\frac{7}{9}, \frac{8}{9}$ (d) $\frac{1}{2}, \frac{2}{5}$

Q.398. Which of the following are co-prime?
RRB NTPC 23/07/2021 (Evening)
(a) 21,56 (b) 28,81 (c) 36,20 (d) 12,27

Q.399. (-3) x (-7) = (-7) x (-3) is _____ property.
RRB NTPC 23/07/2021 (Evening)
(a) closure (b) distributive
(c) commutative (d) associative

Q.400. What is the sum of 1 + 2 + 3 +...+ 49 + 50?
RRB NTPC 24/07/2021 (Morning)
(a) 2550 (b) 2525 (c) 1275 (d) 5050

Q.401. Find the largest four- digit number

which when divided by 7,9 and 11 leaves a remainder of 5 in each case.
RRB NTPC 24/07/2021 (Evening)
(a) 9763 (b) 9707 (c) 9236 (d) 9467

Q.402. Find the divisor, given that dividend is 2200, remainder is 13 and the divisor is one-third of the quotient.
RRB NTPC 24/07/2021 (Evening)
(a) 25 (b) 27 (c) 20 (d) 24

Q.403. What is the least positive integer that should be subtracted from 2750, so that the difference is a perfect cube?
RRB NTPC 24/07/2021 (Evening)
(a) 15 (b) 9 (c) 6 (d) 14

Q.404. How many four- digit numbers are completely divisible by 5,12 and 18?
RRB NTPC 24/07/2021 (Evening)
(a) 49 (b) 48 (c) 50 (d) 47

Q.405. The ascending order of the fractions $\frac{2}{3}, \frac{1}{2}$ and $\frac{1}{6}$ is:
RRB NTPC 26/07/2021 (Morning)
(a) $\frac{1}{6}, \frac{2}{3}, \frac{1}{2}$ (b) $\frac{2}{3}, \frac{1}{6}, \frac{1}{2}$
(c) $\frac{1}{6}, \frac{1}{2}, \frac{2}{3}$ (d) $\frac{2}{3}, \frac{1}{2}, \frac{1}{6}$

Q.406. The difference between two numbers is 45. When 20% of the larger number is added to 35% of the smaller number, we get a sum of 31. What is the sum of the original numbers?
RRB NTPC 26/07/2021 (Morning)
(a) 125 (b) 115 (c) 135 (d) 131

Q.407. The number that has factors other than 1 and itself is called a _____ number.
RRB NTPC 26/07/2021 (Morning)
(a) Prime (b) Composite (c) odd (d) even

Q.408. If the numerator of a fraction is strictly less than the denominator, then the fraction is a/an:
RRB NTPC 26/07/2021 (Morning)
(a) Integer (b) proper fraction
(c) decimal fraction (d) improper fraction

Q.409. The remainder, when 11^{41} + 3 is divided by 10 is:
RRB NTPC 26/07/2021 (Morning)
(a) 5 (b) 3 (c) 6 (d) 4

Q.410. The number of pairs of twin primes between 1 and 100 are:
RRB NTPC 26/07/2021 (Morning)
(a) 10 (b) 8 (c) 9 (d) 7

Q.411. Which of the following fraction falls between $\frac{3}{4}$ and $\frac{6}{7}$?
RRB NTPC 26/07/2021 (Morning)
(a) $\frac{9}{11}$ (b) $\frac{9}{10}$ (c) $\frac{5}{9}$ (d) $\frac{11}{9}$

Q.412. The lowest whole number, which when subtracted from both the terms of the ratio 12 : 17 gives a ratio less than $\frac{11}{20}$, is:
RRB NTPC 26/07/2021 (Evening)
(a) 4 (b) 3 (c) 6 (d) 2

Q.413. The number of factors of 4200 are:
RRB NTPC 26/07/2021 (Evening)
(a) 64 (b) 56 (c) 46 (d) 48

Q.414. Which smallest number must be subtracted from 3467860 so that it becomes exactly divisible by 19?
RRB NTPC 31/07/2021 (Morning)
(a) 11 (b) 50 (c) 30 (d) 18

Q.415. The ratio between two numbers is 3 : 5 and their sum is 80. Find the greater of the two numbers.
RRB NTPC 31/07/2021 (Morning)
(a) 55 (b) 60 (c) 45 (d) 50

Q.416. The sum of the numbers between 17 and 520 that are divisible by 6 is:
RRB NTPC 31/07/2021 (Evening)
(a) 21912 (b) 22446 (c) 22440 (d) 22428

Q.417. On dividing 12401 by a certain number , we get 76 as quotient and 13 as reminder. What is the divisor?
RRB NTPC 31/07/2021 (Evening)
(a) 947 (b) 948 (c) 163 (d) 136

Q.418. The arrangement of rational numbers $\frac{-7}{10}, \frac{5}{-8}, \frac{2}{-3}$, in ascending order is:
RRB NTPC 31/07/2021 (Evening)
(a) $\frac{-7}{10}, \frac{2}{-3}, \frac{5}{-8}$ (b) $\frac{2}{-3}, \frac{5}{-8}, -\frac{7}{10}$
(c) $\frac{5}{-8} - \frac{7}{10}, \frac{2}{-3}$ (d) $\frac{7}{10}, \frac{5}{-8}, \frac{2}{-3}$

RRB JE
(22/05/2019 to 28/06/2019)

Q.419. Decimal part of any number is always _____.
RRB JE 22/05/2019 (Afternoon)
(a) <0 (b) >1 (c) >2 (d) <1

Q.420. What is the remainder when $7^2 \times 9^2$ is divided by 8?
RRB JE 22/05/2019 (Afternoon)
(a) 0 (b) 3 (c) 6 (d) 1

Q.421. Find the smallest integer whose cube is equal to itself.
RRB JE 22/05/2019 (Afternoon)
(a) 1 (b) 2 (c) -1 (d) 0

Q.422. A number of two-digits has 3 for its unit's digit, and the sum of the digits is $\frac{1}{7}$ of the number itself. Find the number.
RRB JE 22/05/2019 (Evening)
(a) 43 (b) 53 (c) 73 (d) 63

Q.423. Which of these numbers has the most number of divisors?
RRB JE 23/05/2019 (Morning)
(a) 240 (b) 156 (c) 200 (d) 172

Q.424. The arithmetic mean and geometric mean of of two numbers are 7 and $2\sqrt{10}$ respectively, then find the numbers.
RRB JE 24/05/2019 (Morning)
(a) 5, 4 (b) 2, 20 (c) 4, 10 (d) 8, 5

Q.425. A number when divided by 234 gives the remainder 36. What will be the remainder when it is divided by 13?
RRB JE 24/05/2019 (Evening)
(a) 6 (b) 9 (c) 10 (d) 11

Q.426. When 8 times of a number is increased by 4, the result is the smallest 3 digit number. What is the number?
RRB JE 25/05/2019 (Morning)
(a) 8 (b) 12 (c) 15 (d) 10

Q.427. Find the sum of first 12 even natural numbers.
RRB JE 28/05/2019 (Afternoon)
(a) 156 (b) 112 (c) 108 (d) 126

Q.428. Three times the square of a number decreased by 4 times the number is equal to 50 more than the number. Find the number.
RRB JE 28/05/2019 (Afternoon)
(a) 6 (b) 4 (c) 10 (d) 5

Q.429. The product of two numbers is 9375. The quotient, when the largest number is divided by the smallest number is 15. Find the sum of these numbers.
RRB JE 30/05/2019 (Afternoon)
(a) 400 (b) 380 (c) 425 (d) 395

Q.430. In a two-digit number, the digit in the unit's place is four times the digit in ten's place and sum of the digits is equal to 10. Find the number.
RRB JE 31/05/2019 (Morning)
(a) 28 (b) 14 (c) 82 (d) 41

Q.431. A number when divided by 15 leaves the remainder 12. Another number

when divided by 5 leaves the remainder 2. What is the remainder when their sum is divided by 5?
RRB JE 31/05/2019 (Afternoon)
(a) 3 (b) 1 (c) 2 (d) 4

Q.432. Find the value of $1^2 + 2^2 + 3^2 + \ldots\ldots\ldots + 10^2$
RRB JE 31/05/2019 (Evening)
(a) 305 (b) 265 (c) 285 (d) 385

Q.433. If a and b are coprime, then a^2 and b^2 are-
RRB JE 31/05/2019 (Evening)
(a) Both odd (b) Need not be coprime
(c) Both even (d) Coprime

Q.434. Find the largest 4 digit number that is exactly divisible by 88.
RRB JE 02/06/2019 (Morning)
(a) 9944 (b) 9844 (c) 9868 (d) 8894

Q.435. ($2^{25} + 2^{26} + 2^{27} + 2^{28}$) is a multiple of which of the following numbers?
RRB JE 02/06/2019 (Afternoon)
(a) 7 (b) 9 (c) 11 (d) 15

Q.436. If the numerator of a fraction is increased by 100% and the denominator is increased by 150%, then the fraction becomes $\frac{16}{25}$. What is the original fraction?
RRB JE 02/06/2019 (Afternoon)
(a) $\frac{5}{6}$ (b) $\frac{5}{12}$ (c) $\frac{7}{12}$ (d) $\frac{4}{5}$

Q.437. From the set of prime numbers between 50 and 100, how many pairs of prime are there that add up to a prime number?
RRB JE 02/06/2019 (Afternoon)
(a) 0 (b) 3 (c) 2 (d) 1

Q.438. Find the largest number that will divide exactly the product of four consecutive integers.
RRB JE 02/06/2019 (Afternoon)
(a) 12 (b) 8 (c) 6 (d) 24

Q.439. Choose the number that is divisible by 11.
RRB JE 02/06/2019 (Evening)
(a) 16461 (b) 1341
(c) 325182 (d) 3178

Q.440. When a positive number is decreased by 4, it is equal to 21 times the reciprocal of the number. Find the number.
RRB JE 02/06/2019 (Evening)
(a) 9 (b) 4 (c) 5 (d) 7

Q.441. The square of a number ends in 4. Then its cube ends in-
RRB JE 26/06/2019 (Evening)
(a) 8 (b) 4 (c) 6 (d) 2 or 8

Q.442. Three times the first of three consecutive odd integers is 3 more than two times the third. Find the third integer.
RRB JE 26/06/2019 (Evening)
(a) 15 (b) 13 (c) 11 (d) 9

Q.443. The end digit of the square of a number is 1. Then the end digit of its cube is:
RRB JE 27/06/2019 (Morning)
(a) 9 only (b) 1 or 9
(c) Any odd number (d) 1 only

Q.444. In a school picnic group, $\frac{2}{9}$ of the group were adults and there were 95 more number of children than adults. How many children were there?
RRB JE 27/06/2019 (Morning)
(a) 95 (b) 133 (c) 190 (d) 103

Q.445. A two-digit number gets reversed on adding 18 to it. The product of the digits is '8'. What is the number?
RRB JE 27/06/2019 (Morning)
(a) 42 (b) 18 (c) 32 (d) 24

Q.446. Find the range of the first 7 prime numbers.
RRB JE 27/06/2019 (Evening)
(a) 15 (b) 8.3 (c) 9 (d) 17

Q.447. How many perfect squares are there between 100 and 200?
RRB JE 27/06/2019 (Evening)
(a) 7 (b) 4 (c) 5 (d) 6

Q.448. If the sum of two numbers is 13 and the sum of their squares is 97, what is their product?
RRB JE 28/06/2019 (Evening)
(a) 72 (b) 84 (c) 110 (d) 36

Q.449. The sum of three consecutive odd numbers is 20 more than the first of these numbers. Find the largest of these numbers.
RRB JE 28/06/2019 (Evening)
(a) 9 (b) 11 (c) 7 (d) 13

Q.450. Find the number which is as much greater than 55 as it is smaller than 95.
RRB JE 28/06/2019 (Evening)
(a) 70 (b) 75 (c) 45 (d) 65

RRB ALP Tier - 2 (21/01/2019 to 08/02/2019)

Q.451. The product of three consecutive natural numbers is always divisible by which of the following numbers?
ALP Tier II 21/01/2019 (Afternoon)
(a) 7 (b) 6 (c) 4 (d) 5

Q.452. How many terms are there in the series $\sqrt{3}, \sqrt{12}, \sqrt{27}, \sqrt{48}, \ldots\ldots, 22\sqrt{3}$?
ALP Tier II 21/01/2019 (Afternoon)
(a) 25 terms (b) 17 terms
(c) 22 terms (d) 15 terms

Q.453. Which of the following is an irrational number?
ALP Tier II 21/01/2019 (Afternoon)
(a) $\sqrt{3} \times \sqrt{27}$ (b) $4\sqrt{4}$
(c) $\sqrt{169} - \sqrt{196}$ (d) $\sqrt{9} + \sqrt{7}$

Q.454. The series 7/6, 4/3, 3/2, 5/3, 11/6 is:
ALP Tier II 21/01/2019 (Afternoon)
(a) in geometric series
(b) arithmetic-geometric progression
(c) in harmonic series
(d) in arithmetic series

Q.455. If a, b, c are in A.P., then which of the following is correct?
ALP Tier II 21/01/2019 (Afternoon)
(a) 2c = a + b (b) 2a = b + c
(c) 2b = a + c (d) 3b = 2a + 3c

RPF Constable (17/01/2019 to 19/02/2019)

Q.456. How much remains after dividing the 5224 to 9?
RPF Constable 17/01/2019 (Evening)
(a) 4 (b) 3 (c) 0 (d) 5

Q.457. Find the average of arithmetic progression whose first term is 33 and the last term is 45.
RPF Constable 18/01/2019 (Morning)
(a) 37 (b) 39 (c) 43 (d) 41

Q.458. Find the average of the arithmetic parallel series whose first term is 45 and the last term is 57.
RPF Constable 19/01/2019 (Morning)
(a) 49 (b) 53 (c) 55 (d) 51

RPF S.I. (19/12/2018 to 16/01/2019)

Q.459. Find the number of trailing zeros in 76!
RPF S.I. 19/12/2018 (Morning)
(a) 18 (b) 16 (c) 20 (d) 14

Q.460. A number when divided by 42 leaves a remainder of 13. What will be the remainder when the same number is divided by 14?
RPF S.I. 19/12/2018 (Morning)
(a) 10 (b) 8 (c) 13 (d) 12

Q.461. In how many ways can 480

mobiles be distributed equally to the students of a class?
RPF S.I. 19/12/2018 (Morning)
(a) 14 (b) 16 (c) 20 (d) 24

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.462. Which of the following is not a Triangular number?
RRB ALP 09/08/2018 (Morning)
(a) 3 (b) 15 (c) 10 (d) 5

Q.463. Which of the following numbers will have an irrational square root?
RRB ALP 09/08/2018 (Morning)
(a) 1024 (b) 2048 (c) 2401 (d) 4096

Q.464. Find a two digit number which is exactly three times the product of its digits?
RRB ALP 09/08/2018 (Morning)
(a) 12 (b) 48 (c) 24 (d) 36

Q.465. Which of the numbers given below is NOT rational?
RRB ALP 09/08/2018 (Afternoon)
(a) $\sqrt[3]{64}$ (b) $\sqrt{8}$ (c) $\sqrt[3]{8}$ (d) $\sqrt{64}$

Q.466. Which of the following numbers is not composite?
RRB ALP 14/08/2018 (Morning)
(a) 109 (b) 161 (c) 203 (d) 209

Q.467. The square root of which of the following numbers is irrational?
RRB ALP 14/08/2018 (Afternoon)
(a) 3969 (b) 6560 (c) 5625 (d) 1764

Q.468. 'P' is the smallest positive integer such that every positive integer N greater than 'P' can be written as a sum of two composite numbers. Then 'P' is:
RRB ALP 17/08/2018 (Morning)
(a) 3 (b) 11 (c) 6 (d) 10

Q.469. Which of the following is the prime number series from 1 to 20 ?
RRB ALP 20/08/2018 (Morning)
(a) 3, 5, 7, 11, 13, 17, 19
(b) 2, 3, 5, 7, 11, 13, 17, 19
(c) 2, 5, 7, 9, 11, 13, 17, 19
(d) 1, 2, 3, 5, 7, 11, 13, 17, 19

Q.470. Which of the following will yield a recurring decimal?
RRB ALP 20/08/2018 (Afternoon)
(a) $\frac{21}{90}$ (b) $\frac{21}{60}$ (c) $\frac{21}{30}$ (d) $\frac{21}{120}$

Q.471. How many of the factors of 256 are perfect squares?
RRB ALP 20/08/2018 (Afternoon)
(a) 4 (b) 3 (c) 6 (d) 5

Q.472. If the number x3451 is divisible by 3, where x is a digit, what can be the sum of all such values of x?
RRB ALP 20/08/2018 (Afternoon)
(a) 16 (b) 15 (c) 11 (d) 14

Q.473. If the number x4562 is divisible by 9, what is the face value of x?
RRB ALP 21/08/2018 (Morning)
(a) 4 (b) 3 (c) 2 (d) 1

Q.474. Which of the following pairs is NOT a pair of twin primes?
RRB ALP 21/08/2018 (Afternoon)
(a) 71, 73 (b) 191, 193
(c) 131, 133 (d) 11, 13

Q.475.A natural number, when divided by 5, 6, 7 or 8, leaves a remainder of 4 in each case. What is the smallest of all such numbers?
RRB ALP 21/08/2018 (Evening)
(a) 214 (b) 844 (c) 424 (d) 1264

Q.476. Which of the numbers given below is exactly divisible by 12?
RRB ALP 29/08/2018 (Evening)
(a) 28544 (b) 14632
(c) 57816 (d) 43688

Q.477. Split 69 into three parts such that they are in A.P. and the product of their smaller parts is 483.
RRB ALP 30/08/2018 (Morning)
(a) 15,23,31 (b) 19,23,27
(c) 17,23,29 (d) 21,23,25

Q.478. Which of the following numbers is irrational?
RRB ALP 30/08/2018 (Morning)
(a) $\sqrt{64}$ (b) $\sqrt[3]{64}$ (c) $\sqrt[6]{64}$ (d) $\sqrt[4]{64}$

Q.479. Which of the following numbers will have an irrational square root?
RRB ALP 30/08/2018 (Afternoon)
(a) 1825 (b) 625 (c) 3025 (d) 1225

Q.480. By which least number should 1568 be divided so that the resultant number is a perfect square ?
RRB ALP 30/08/2018 (Afternoon)
(a) 3 (b) 5 (c) 6 (d) 2

Q.481. The square root of which of the following numbers is irrational?
RRB ALP 30/08/2018 (Afternoon)
(a) 7840 (b) 2916 (c) 4489 (d) 1024

Q.482. What is the sum of the first 16 terms of the given series:
6, $\frac{13}{2}$, 7 , $\frac{15}{2}$, ...
RRB ALP 30/08/2018 (Afternoon)
(a) $\frac{313}{2}$ (b) 157 (c) 156 (d) $\frac{311}{2}$

Q.483. In a 3-digit number, the hundreds digit is 4 times the units digit and the tens digit is thrice the units digit. The sum of the digits is 8. What is the tens digit in the number?
RRB ALP 30/08/2018 (Evening)
(a) 6 (b) 3 (c) 9 (d) 4

Q.484. The denominator of a rational number exceeds its numerator by 10. If the numerator is increased by 4 and the denominator is reduced by 3, the number obtained is $\frac{5}{6}$. The original rational number is.
RRB ALP 31/08/2018 (Morning)
(a) $\frac{9}{19}$ (b) $\frac{11}{21}$ (c) $\frac{13}{23}$ (d) $\frac{7}{17}$

Q.485. What will be the 20th term in the given sequence ?
−50, −47, −44, _____
RRB ALP 31/08/2018 (Morning)
(a) −7 (b) 10 (c) −10 (d) 7

Q.486. Among the following, which is a rational number?
RRB ALP 31/08/2018 (Morning)
(a) $\sqrt[5]{32}$ (b) $\sqrt[6]{32}$ (c) $\sqrt[3]{32}$ (d) $\sqrt[4]{32}$

Q.487. How many three digit whole numbers are there between 75 and 405?
RRB ALP 31/08/2018 (Afternoon)
(a) 304 (b) 306 (c) 305 (d) 307

Q.488. What is the difference between the place value and face value of 3 in 273965?
RRB ALP 31/08/2018 (Afternoon)
(a) 3962 (b) 2035 (c) 2997 (d) 0

Answer key:-

1.(a)	2.(b)	3.(d)	4.(d)
5.(b)	6.(b)	7.(d)	8.(c)
9.(c)	10.(c)	11.(b)	12.(c)
13.(a)	14.(b)	15.(b)	16.(b)
17.(d)	18.(c)	19.(d)	20.(a)
21.(d)	22.(a)	23.(c)	24.(c)
25.(b)	26.(d)	27.(d)	28.(d)
29.(b)	30.(c)	31.(c)	32.(c)
33.(c)	34.(b)	35.(a)	36.(a)
37.(d)	38.(b)	39.(d)	40.(a)
41.(a)	42.(b)	43.(d)	44.(d)
45.(b)	46.(a)	47.(a)	48.(a)
49.(a)	50.(c)	51.(a)	52.(b)
53.(a)	54.(b)	55.(a)	56.(b)
57.(b)	58.(a)	59.(a)	60.(d)

61.(b)	62.(c)	63.(c)	64.(b)
65.(d)	66.(b)	67.(b)	68.(d)
69.(b)	70.(a)	71.(b)	72.(b)
73.(a)	74.(b)	75.(a)	76.(c)
77.(a)	78.(d)	79.(c)	80.(d)
81.(d)	82.(b)	83.(d)	84.(c)
85.(d)	86.(a)	87.(a)	88.(b)
89.(a)	90.(a)	91.(b)	92.(b)
93.(b)	94.(c)	95.(b)	96.(a)
97.(c)	98.(b)	99.(b)	100.(a)
101.(a)	102.(d)	103.(a)	104.(a)
105.(b)	106.(b)	107.(b)	108.(d)
109.(a)	110.(d)	111.(d)	112.(d)
113.(b)	114.(c)	115.(a)	116.(d)
117.(d)	118.(a)	119.(d)	120.(d)
121.(a)	122.(b)	123.(a)	124.(b)
125.(a)	126.(b)	127.(c)	128.(c)
129.(c)	130.(d)	131.(c)	132.(d)
133.(c)	134.(d)	135.(a)	136.(b)
137.(b)	138.(c)	139.(c)	140.(a)
141.(c)	142.(a)	143.(b)	144.(a)
145.(c)	146.(c)	147.(c)	148.(a)
149.(a)	150.(a)	151.(c)	152.(a)
153.(d)	154.(d)	155.(c)	156.(c)
157.(a)	158.(c)	159.(d)	160.(b)
161.(d)	162.(a)	163.(c)	164.(a)
165.(d)	166.(d)	167.(b)	168.(b)
169.(a)	170.(d)	171.(b)	172.(a)
173.(a)	174.(a)	175.(c)	176.(b)
177.(a)	178.(d)	179.(d)	180.(a)
181.(a)	182.(d)	183.(d)	184.(d)
185.(b)	186.(b)	187.(c)	188.(d)
189.(b)	190.(a)	191.(d)	192.(b)
193.(c)	194.(b)	195.(c)	196.(c)
197.(a)	198.(c)	199.(a)	200.(c)
201.(b)	202.(a)	203.(c)	204.(a)
205.(b)	206.(c)	207.(c)	208.(a)
209.(a)	210.(a)	211.(a)	212.(a)
213.(c)	214.(c)	215.(c)	216.(a)
217.(a)	218.(b)	219.(a)	220.(c)
221.(c)	222.(d)	223.(c)	224.(d)
225.(b)	226.(b)	227.(b)	228.(d)
229.(a)	230.(a)	231.(d)	232.(d)
233.(a)	234.(b)	235.(c)	236.(c)
237.(a)	238.(a)	239.(c)	240.(b)
241.(c)	242.(d)	243.(c)	244.(d)

245.(c)	246.(d)	247.(a)	248.(b)
249.(d)	250.(d)	251.(c)	252.(a)
253.(a)	254.(b)	255.(b)	256.(b)
257.(a)	258.(b)	259.(a)	260.(a)
261.(a)	262.(d)	263.(a)	264.(b)
265.(c)	266.(c)	267.(c)	268.(d)
269.(b)	270.(a)	271.(c)	272.(c)
273.(b)	274.(b)	275.(a)	276.(d)
277.(a)	278.(c)	279.(d)	280.(b)
281.(a)	282.(b)	283.(d)	284.(b)
285.(a)	286.(a)	287.(a)	288.(c)
289.(b)	290.(d)	291.(d)	292.(a)
293.(b)	294.(b)	295.(c)	296.(a)
297.(b)	298.(c)	299.(b)	300.(b)
301.(b)	302.(c)	303.(d)	304.(a)
305.(d)	306.(b)	307.(d)	308.(c)
309.(a)	310.(d)	311.(d)	312.(c)
313.(b)	314.(a)	315.(c)	316.(c)
317.(a)	318.(d)	319.(a)	320.(d)
321.(d)	322.(a)	323.(c)	324.(b)
325.(d)	326.(c)	327.(c)	328.(c)
329.(c)	330.(a)	331.(c)	332.(d)
333.(b)	334.(d)	335.(b)	336.(a)
337.(c)	338.(d)	339.(c)	340.(d)
341.(d)	342.(b)	343.(d)	344.(d)
345.(a)	346.(b)	347.(b)	348.(a)
349.(d)	350.(d)	351.(c)	352.(c)
353.(c)	354.(b)	355.(b)	356.(d)
357.(d)	358.(a)	359.(c)	360.(a)
361.(d)	362.(b)	363.(b)	364.(d)
365.(b)	366.(b)	367.(c)	368.(d)
369.(d)	370.(b)	371.(b)	372.(b)
373.(d)	374.(a)	375.(b)	376.(c)
377.(a)	378.(c)	379.(b)	380.(b)
381.(c)	382.(b)	383.(c)	384.(a)
385.(d)	386.(d)	387.(a)	388.(c)
389.(b)	390.(a)	391.(b)	392.(d)
393.(c)	394.(d)	395.(b)	396.(c)
397.(a)	398.(b)	399.(c)	400.(c)
401.(b)	402.(b)	403.(c)	404.(c)
405.(c)	406.(a)	407.(b)	408.(b)
409.(d)	410.(b)	411.(a)	412.(c)
413.(d)	414.(d)	415.(d)	416.(d)
417.(c)	418.(a)	419.(d)	420.(d)
421.(c)	422.(d)	423.(a)	424.(c)
425.(c)	426.(b)	427.(a)	428.(d)

429.(a)	430.(a)	431.(d)	432.(d)
433.(d)	434.(a)	435.(d)	436.(d)
437.(a)	438.(d)	439.(c)	440.(d)
441.(d)	442.(a)	443.(b)	444.(b)
445.(d)	446.(a)	447.(b)	448.(d)
449.(b)	450.(b)	451.(b)	452.(c)
453.(d)	454.(d)	455.(c)	456.(a)
457.(b)	458.(d)	459.(a)	460.(c)
461.(d)	462.(d)	463.(b)	464.(c)
465.(b)	466.(a)	467.(b)	468.(b)
469.(b)	470.(a)	471.(d)	472.(b)
473.(d)	474.(c)	475.(b)	476.(c)
477.(d)	478.(d)	479.(a)	480.(d)
481.(a)	482.(c)	483.(b)	484.(b)
485.(d)	486.(a)	487.(c)	488.(c)

Solutions :-

Sol.1.(a) Difference = 335 - 265 = 70
According to the question,
Quotient = 70 × 3 = 210 ,Divisor
= 335 + 265 = 600 ,remainder = 35
We know that, Dividend
= quotient × divisor + remainder
Therefore, Number
= 210 × 600 + 35 = 126035

Sol.2.(b) If 3x5479y4 is divisible by 88 it must be divisible 11 and 8
Divisibility rule for 8 → if last three digit number of any number divisible by 8 it will be divisible by 8
For 3x5479y4 ⇒ Y = 0, 4,8
(for greatest value we take Y = 8)
Divisibility rule for 11 → difference between sum of digit of odd place and sum of digit of even place should be 0 or multiple of 11
3 + 5 + 7 + y - (x + 4 + 9 + 4) = 0 or 11
15 + y - (x + 17) = 0 ⇒ 15 + y = (x +17)
Put Y = 8 we get X = 6
Divisibility rule for 9 → sum of all digit is divisible by 9, 425139z2
→4 + 2 + 5 + 1 + 3 + 9 + z + 2 = 26 + z
= Z = 1= (3x + 2y - z) = (3 × 6 + 2 × 8 - 1) = 33

Sol.3.(d) Let the numerator be x and denominator be y

$\frac{x+2}{y+5} = \frac{1}{2} \Rightarrow 2x - y = 1$..... (1)

$\frac{x-2}{y-2} = \frac{1}{3} \Rightarrow 3x - y = 4$..... (2)

Subtracting eq, (2) from (1)

x = 3 and y = 5 , Required fraction = $\frac{x}{y} = \frac{3}{5}$

Sol.4.(d) 1771 = 7 × 11 × 23
Sum of last two prime numbers= 82
Fourth prime number = 82 - 23 = 59

7 , 11 , 23 , 59
Product of the last two prime numbers
= 23 × 59 = 1357

Sol.5.(b) $9^6 \times 12^4 \times 7^7 = (3 \times 3)^6 \times (2 \times 2 \times 3)^4 \times 7^7$
Hence, sum of the prime factors
= 2 + 3 + 7 = 12

Sol.6.(b) 688xy Divide by L.C.M.(11 ,21) =231 let xy = 99 greatest number

231) 68899 (298
-462
2269
-2079
1909
-1848
61

So number(XY) = 99 - 61=38
⇒ value of (8x - 3y + xy)
= 8 × 3 - 3 × 8 + 3 × 8 = 24

Sol.7.(d) Divisibility of 3 = Sum of digits should be divisible by 3.
3 + 2 = 5, then new number
= 567 (divisible by 3)
4 + 2 = 6, then new number
= 689 (not divisible by 3)
5 + 2 = 7, then new number
= 714 (divisible by 3)
6 + 2 = 8, then new number
= 832 (not divisible by 3)
7 + 2 = 9, then new number
= 928 (not divisible by 3)
So, there are two numbers which will be divisible by 3.

Sol.8.(c) Smaller positive integers is x and the larger positive integer = x+1
$\Rightarrow x(x+1) = 552 \Rightarrow x^2 + x - 552 = 0$

Sol.9.(c) 12600 = $p^3 \times q^2 \times r^2 \times s^1$
12600 = $7^1 \times 3^2 \times 2^3 \times 5^2$
P = 2, Q = 3, R = 5, S = 7
$(3p + 2q - r + s)$
= 3(2) + 2(3) - 5 + 7 = 14

Sol.10.(c) Let the number = x
Actual result = 2.4x
Mistaken result = 4.2x
As per question,
4.2x = 65.1 ⇒ x = 15.5
So, Actual number
= 2.4x = 2.4 × 15.5 = 37.2

Sol.11.(b)
947 + 1218 = 861 + 1304 = 787 + 1378
2165 ⇒ 2165 = 2165
NOTE :- During exam, Just check the unit digit and eliminate the options.

Sol.12.(c) As there are as many students in a row as there are rows in the auditorium, it means this arrangement forms a square where the number of rows and columns are equal. So as the total number of students = 6889, the number of rows = $\sqrt{6889}$ = 83

Sol.13.(a) Given, 1² + 2² + 3² +.....+14² = 1015,
Then, 3² + 6² + 9².....+ 42²
= 3² × (1² + 2² + 3² +..... +14²)
= 9 × 1015 = 9135

Sol.14.(b) The given numbers are
$\sqrt{3^2 + 4^2}$, $\sqrt{12.96}$, $\sqrt{125}$ and $\sqrt{900}$
Here, $\sqrt{3^2 + 4^2}$ = 5 $\sqrt{12.96}$ = 3.6
$\sqrt{125}$ = $5\sqrt{5}$
$\sqrt{900}$ = 30
So, the only irrational (not rational) number is $\sqrt{125}$ = $5\sqrt{5}$

Sol.15.(b) Here
(18 - 7) = (21 - 10) = (24 - 13) = 11,
LCM of 18, 21, 24 = 504,
So, the least multiple of 23 when divided by 18, 21 and 24 leave the remainder 7, 10 and 13 respectively is $= 504k - 11$ [where k = 1,2,3,....]
Now we can write,
$504k - 11 = 483k + 21k - 11$
[here 483 is divisible by 23, so we have to find for which value of k, (21k - 11) will be divisible by 23]
If we put k = 6,
$21k - 11 = 126 - 11 = 115$
[115 is divisible by 23]
So, the least multiple of 23 when divided by 18, 21 and 24 leave the remainder 7, 10 and 13 respectively
= 504k - 11 = 504 × 6 -11
= 3024 - 11 = 3013

Sol.16.(b)
301 to 399 ⇒ in first place = 99 times
330 to 339 ⇒ in 2nd place = 10 times
In 3rd place = 10 times
Total = 99 + 10 + 10 = 119

Sol.17.(d) $(1 - \frac{1}{n})$ + (1 - $\frac{2}{n}$) + (1 - $\frac{3}{n}$) .....+ up to n terms
= (n) – $\frac{1}{n}$(1 + 2 + 3 + 4 + ... + n)
= (n) – $\frac{1}{n} \times \frac{n(n+1)}{2}$
= (n) – $\frac{(n+1)}{2}$ = $\frac{n-1}{2}$

Sol.18.(c) Let the number of correct answer = x Incorrect answers = 120 - x
According to question ,
x - $\frac{1}{2}$(120 - x) = 90 ⇒ x - 60 + $\frac{x}{2}$ = 90
⇒ $\frac{3x}{2}$ = 150 = x = $\frac{300}{3}$ = 100

Sol.19.(d) According to question ,
= 10000a + 1000b + 100c + 10d + e
= $10^4a + 10^3b + 10^2c + 10d + e$

Sol.20.(a) Number of total handshakes
= $\frac{40 \times 39}{2}$ = 780

Sol.21.(d) Reverse of 14 = 41
Difference between 41 and 14 = 27
Five numbers of two digits increase by 27 when their digits are reversed.
25 ↔ 52, 69 ↔ 96, 47 ↔ 74 41 ↔ 14 and 58 ↔ 58

Sol.22.(a) If we multiply 495 by 36 we get 17820 as result. But if boy read 6 in place of 9 he got 16740 as result
So 9 is erroneously read as 6.

Sol.23.(c) $(I^2 - C^2 \times \frac{P}{R})$ + 8
= (9^2 - 3^2 × $\frac{16}{18}$) + 8 = (81 - 9 × $\frac{16}{18}$) + 8
= 81

Sol.24.(c)
$\frac{1}{1\times4} + \frac{1}{4\times7} + \frac{1}{7\times10} + ... + \frac{1}{47\times50}$
= $\frac{1}{3} \times [\frac{3}{1\times4} + \frac{3}{4\times7} + \frac{3}{7\times10} + .. \frac{3}{47\times50}]$ = $\frac{1}{3} \times [1 - \frac{1}{4} + \frac{1}{4} - \frac{1}{7} + \frac{1}{7} - \frac{1}{10} ... + \frac{1}{47} - \frac{1}{50}]$ = $\frac{49}{150}$

Short Tricks :-
Sum = $\frac{1}{(n-1)d}\left\{\frac{1}{k} - \frac{1}{L}\right\}$
Where , n = no. of terms in denominator
d = difference between the terms
k = first term of first denominator and
L = last term of last denominator .
Required Sum = $\frac{1}{(2-1)3}\left\{\frac{1}{1} - \frac{1}{50}\right\}$
= $\left\{\frac{49}{150}\right\}$

Sol.25.(b) Let the numbers are = x and y
x + y = r ... (1)
x ÷ $y = \frac{s}{t} \Rightarrow \frac{x}{y} = \frac{s}{t} \Rightarrow x = \frac{sy}{t}$
Putting value of x in equation (1)
$\frac{sy}{t} + y = r \Rightarrow$ y ($\frac{s}{t}$+ 1) = r
⇒ y = $\frac{rt}{s+t}$
From equation (1)
x = r - $\frac{rt}{s+t}$ = $\frac{rs}{s+t}$

Sol.26.(d) Arithmetic mean = 10
Let the numbers be a and b
According to question ,
a + b = 20
And, $\sqrt{ab} = 5 \Rightarrow ab = 25$
Now,

$(a + b)^2 = a^2 + b^2 + 2ab$

$\Rightarrow 20^2 = a^2 + b^2 + 2 \times 25$

$\Rightarrow 400 = a^2 + b^2 + 50 \Rightarrow a^2 + b^2 = 350$

Sol.27.(d) Given,

$\frac{1}{16} > \frac{n}{160} > \frac{1}{20} \Rightarrow 10 > n > 8$

since n is a integer so n = 9 as it is greater than 8 and less than 10

Sol.28.(d) 9 X 7 + 8YZ + 7Z1 = 2526

When we add unit digits we get 8 + Z, but in the result it is given 6

So possible value of Z = 8, (8 + 8 = 16)

Sum of 100th place digits = 9 + 8 + 7 =24

So, X + Y + Z + 1 = 12 , X + Y + 8 + 1 = 12

X + Y = 3, X = 3 (maximum)

Sol.29.(b) If P is a prime number and P divides Q^2, then P will also divide Q

So P will not divide the next number after Q

So Q + 1 is not divisible by P.

Sol.30.(c) For Possible value of x

Given , Remainder = x - 5

{ The remainder cannot be less than five or five because By taking these values we will get 0 and -ve , which is not possible.}

Let ,

(i) x = 6 then , $\frac{43}{x} = \frac{43}{6}$, remainder

= 1 , So , 1 = x - 5 $\Rightarrow$ x = 6 [proved]

(ii) x = 8 then , $\frac{43}{x} = \frac{43}{8}$, remainder

= 3 So , 3 = x - 5 $\Rightarrow$ x = 8 [proved]

(iii) x = 12 then , $\frac{43}{x} = \frac{43}{12}$, remainder

= 7, So , 7 = x - 5 $\Rightarrow$ x = 12 [proved]

(iv) x = 16 then , $\frac{43}{x} = \frac{43}{16}$, remainder

=11, So , 11 = x - 5 $\Rightarrow$ x = 16 [proved]

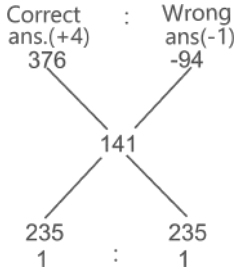
(v) x = 24 then , $\frac{43}{x} = \frac{43}{24}$, remainder

= 19 So , 19 = x - 5 $\Rightarrow$ x = 24 [proved]

(vi) x = 48 then, $\frac{43}{x} = \frac{43}{48}$, remainder

= 43, So , 43 = x - 5 $\Rightarrow$ x = 48 [proved]

Sol.31.(c) Using Alligation method we have :



Here, 1 + 1 = 2 uni= 94 questions

Then, 1 unit = $\frac{94}{2}$ = 47

The no of question wrongly answered by X = 47

Sol.32.(c) Divisibility of 4 = last two digits must be divisible by 4.

Divisibility of 8 = last three digits must be divisible by 8.

Here, 3824 is divisible by both 4 and 8.

Sol.33.(c) The 2-digit number which are divisible by 2 and 4 = 12, 16, ...96

Total number = $\frac{96 - 12}{4}$ + 1 = 21 + 1 = 22

Sol.34.(b) 115 x y is divisible by 90

So, y = 0 as this number must be divisible by 10, For divisibility of 9, sum of digits must be divisible by 9

1 + 1 + 5 + x + 0 =7 + x = 9, so, x = 2

Value of (x + y) = 2 + 0 = 2

Sol.35.(a) $34^2 < 1212 < 35^2$

Smallest number that should be added

$= 35^2 - 1212 = 1225 - 1212 = 13$

Sol.36.(a) HCF of coprime numbers = 1.

H.C.F of 34 and 35 = 1.

Sol.37.(d) 6300 = 2 × 2 × 3 × 3 × 5 × 5 × 7

Hence, 7 must be multiplied by 6300 to make a perfect square.

6300 × 7 = 44100 = 210^2

Sol.38.(b)

Let the numbers are x and $x + 18$.

Now, $x + x + 18 = 32$

$\Rightarrow 2x = 32 - 18 \Rightarrow 2x = 14 \Rightarrow x = 7$

Greater number = x + 18 = 7 + 18 = 25

Sol.39.(d) (11 , 13) is co-prime because

H.C.F of 11 and 13 = 1

(15 , 17) is co-prime because

H.C.F of 15 and 17 = 1

(17 , 23) is co-prime because

H.C.F of 17 and 23 = 1

(17 , 34) is not co-prime because

H.C.F of 17 and 34 = 17

Sol.40.(a) Mohit's 1 month salary= ₹15000

His 1 month expenditure

= 5000 + 2000 = ₹ 7000

1 month saving = 15000 - 7000 = ₹ 8000

He spends his total saving of birthday month on celebration.

Now, his saving for 11 month

= 8000 × 11 = ₹ 88,000

Sol.41.(a)

Largest 2-digit prime number = 97

and Largest 3-digit prime number = 997

Required sum = 2 × 97 + 3 × 997

= 194 + 2991 = 3185

Sol.42.(b) Prime numbers between 51 and 100 are 53 , 59 , 61 , 67 , 71 , ... 97

Sum of the smallest and the greatest prime numbers = 53 + 97 = 150

Sol.43.(d) Let the price of each pencil be ₹ x and price of each pen be ₹ y

$3x + 5y = 81$..... (1)

$5x + 3y = 71$..... (2)

By solving eq, (1) and (2), we get

x = 7 and y = 12

C.P of 1 pencil and 2 pens

= (1 × 7) + (2 × 12) = 7 + 24 = ₹31

Sol.44.(d) Let the digit at one's place be x and the digit at ten place be y.

$\Rightarrow$ x + y = 9.....(1) $\Rightarrow$ 10y + x = 5x + 6

4x - 10y = -6 .....(2)

By solving eq, (1) and (2), we get

x = 6 , y = 3, Required number

= 10y + x = 10 × 3 + 6 = 30 + 6 = 36

Sol.45.(b) Sum of first 8 prime numbers

= 2 + 3 + 5 + 7 + 11 + 13 + 17 + 19 = 77

Required number = 77 ÷ 7 = 11

Sol.46.(a) Let the first multiple of 9 be x.

$9x + 9(x + 1) + 9(x + 2) = 2457$

$\Rightarrow 9x + 9x + 9 + 9x + 18 = 2457$

$\Rightarrow 27x = 2457 - 27$

$\Rightarrow 27x = 2430 \Rightarrow x = 90$

Largest number

= 9 × (90 + 2) = 9 × 92 = 828

Sol.47.(a) Three digit numbers are 100 , 101 .....998 , 999

total numbers divisible by 2 = 450 = n(2)

total numbers divisible by 5 = 180 = n(5)

total numbers divisible by both 2 and 5 = 90 = n(2 and 5)

The total numbers of three-digit numbers divisible by 2 or 5 = n(2 or 5)

= n(2) + n(5) - n(2 and 5)

The total number of three-digit numbers divisible by 2 or 5 = 450 + 180 - 90 = 540

Sol.48.(a) Let the first consecutive natural number be x

Now, $x^2 + (x + 1)^2 = 313$

$\Rightarrow x^2 + x^2 + 1 + 2x = 313$

$\Rightarrow 2x^2 + 2x - 312 = 0$

$\Rightarrow x^2 + x - 156 = 0$

$\Rightarrow x^2 + 13x - 12x - 156 = 0$

$\Rightarrow (x + 13)(x - 12) = 0$

Smaller number = 12

Sol.49.(a) $1 + 3 + 5 + 7 + \ldots\ldots\ldots + 21$

Sum of odd numbers = n^2, where n is number of terms.

Here n = 11, sum = $11^2 = 121$

Sol.50.(c) Divisible by both 3 and 4 → divisible by 12
The numbers between 1 to 150 divisible by 12 = $\frac{150}{12}$ = 12

Sol.51.(a) $4 + 4^{n+5} = 260$
$4^{n+5} = 256 = 4^4$
On comparing powers, we get: n + 5 = 4
⇒ n = -1 ⇒ $5^{-1+3} = 5^2 = 25$

Sol.52.(b)

3	266805
3	88935
5	29645
7	5929
7	847
11	121
11	11
	1

$266805 = 3^2 \times 5 \times 7^2 \times 11^2$

Sol.53.(a) Number (N) = DQ + R , where D is the divisor , Q is quotient and R is the remainder So, N = DQ + 16
2N = 2DQ + 32 or 29 + 3
Now, the divisor is either 29 itself or the factor of 29 which is more than 3.
On checking the options , we get the least possible value of D = 29

Sol.54.(b) Let the first number be x then second number = (27 - x)
$5x = 4(27 - x)$
$\Rightarrow 5x + 4x = 108 \Rightarrow 9x = 108 \Rightarrow x = 12$
Smaller number = 12

Sol.55.(a) Let the unit digit number be x, and the digit at ten's place be y.
$10y + x + 10x + y = 99$
$\Rightarrow 11x + 11y = 99 \Rightarrow x + y = 9$..... (1)
$x - y = 5$..... (2)
By solving eq,(1) and (2),
we get x = 7 and y = 2
Hence, the required number = 27

Sol.56.(b) Let the number = x
ATQ, $x + \frac{x}{2} + \frac{x}{3} + 27 = 71$
$\Rightarrow \frac{6x+3x+2x}{6} = 44 \Rightarrow \frac{11x}{6} = 44$
So, x = 24

Sol.57.(b) A × B = 143 ⇒ 11 × 13
Let A = 11 So , B = 13 ,
B × C = 195 So, C = 15
11 , 13 and 15 are co- prime to each other The sum = 11 + 13 + 15 = 39

Sol.58.(a) By taking option A
467851 + 5 = 467856
Which is square of 684

Sol.59.(a) Let the numbers are a and b.
a + b = 45.....(1) and a - b = 19.....(2)
On solving eq,(1) and (2), we get a = 32 and b = 13

Sol.60.(d) 158 - 4 = 154 and 215 - 5 = 210
H.C.F of 154 and 210 = 14

Sol.61.(b)
Let the first consecutive number be x
$6x + 6(x + 1) = 66$
$\Rightarrow 12x = 66 - 6 \Rightarrow 12x = 60 \Rightarrow x = 5$
Smaller multiple of 6 = 6 × 5 = 30

Sol.62.(c) Divisibility of 8 : last 3 digits must be divisible by 8. 6 4 8 4 y 6
$\rightarrow 4\,y\,6 \div 8 \rightarrow 4\,1\,6 \div 8 = 52$
Least value of y = 1

Sol.63.(c) Let the number be x .
$5x = 65 \Rightarrow x = 13$, Required number = 13

Sol.64.(b)
Prime numbers between 20 and 80 ;
23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79.
Hence, there are 14 prime numbers between 20 and 80.

Sol.65.(d) Let the number be N and the quotient be x, then the number
$\Rightarrow N = 15x + 9$
Now, $\frac{15x+9}{5} = \frac{15x}{5} + \frac{9}{5}$
⇒ remainder = 0 + 4
Hence, the required remainder = 4

Sol.66.(b)
Composite numbers are numbers that have more than two factors
Factors of 4 = 1, 2 and 4, Therefore,
4 is the smallest composite number.

Sol.67.(b) Let the number = x
ATQ,
$\Rightarrow \frac{x}{3} - \frac{x}{5} = 6 \Rightarrow \frac{5x-3x}{15} = 6 \Rightarrow \frac{2x}{15} = 6$
Therefore, x = 45

Sol.68.(d) let the number = 10x + y
ATQ, (x + y) × 7 = 10x + y
⇒ 7x + 7y = 10x + y
So, x = 2y And 10x + y - (10y + x) = 18
⇒ x - y = 2 ....(1)
By putting value of x in the equation (1)
⇒2y - y = 2 So, y = 2 and x = 4
Product of digits = 2 x 4 = 8

Sol.69.(b) Prime number less than 50 :
2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43 , 47, Total prime numbers = 15

Sol.70.(a) $(\frac{3}{7})^8 \times (\frac{3}{7})^{-14} = (\frac{3}{7})^{3p-3}$
$(\frac{3}{7})^{8-14} = (\frac{3}{7})^{3p-3}$
If two terms have the same base, then we can equate their powers.
3p - 3 = - 6 ⇒ 3P = - 3 ⇒ So, p = -1

Sol.71.(b) Middle number of consecutive numbers = average of the numbers
So middle number = $\frac{141}{3}$ = 47

Sol.72.(b) By observing options,
x + y =11 + 7 = 18 ⇒ xy = 11 × 7 = 77
Therefore option (b) is the right answer.

Sol.73.(a)
Average of the five consecutive number
= $\frac{240}{5}$ = 48 We know that ,
Average of consecutive number
= $\frac{first\ number + last\ number}{2}$
So ,$first\ number + last\ number$
= 48 × 2 = 96

Sol.74.(b) We know that $n^0 = 1$
(where n = natural number)
$(11^0 + 21^0 - 7^0 + 3^0) \times 5^0$
= (1 + 1 - 1 + 1) × 1 = 2

Sol.75.(a)
Divisibility of 2 = last two digit (0,2,4,6,8)
Divisibility of 3 = sum of digits divisible by 3.
Divisibility of 5 = last digit must be 0 , 5
Now, by options we can see that 3150 is divisible by 2,3 and 5.

Sol.76.(c) Let the number = x
$2x + 3 \times 52 = 342$
$\Rightarrow 2x + 156 = 342 \Rightarrow 2x = 342 - 156$
$\Rightarrow 2x = 186 \Rightarrow x = 93$
Now, Required number
= 4x + 2 × 52 = 372 + 104 = 476

Sol.77.(a) Let the numbers are x and y.
$x + y = 9$..... (1) $and\ x^2 + y^2 = 41$..... (2)
Squaring eq,(1), $x^2 + y^2 + 2xy = 81$
$\Rightarrow xy = 81 - 41 = 20$
Now, by hit and trial method , x = 5 and y = 4

Sol.78.(d) Let the first even number be x
$x + x + 2 + x + 4 + x + 6 + x + 8 = 2720$
$\Rightarrow 5x = 2720 - 20 \Rightarrow 5x = 2700 \Rightarrow x = 540$
Required number = 3rd + 5th
= (540 + 4) + (540 + 8)
= 544 + 548 = 1092

Sol.79.(c) Given number:
242, 657, 864, 264, 764, 218, 845
after 1 is added to the first digit and 1 is subtracted for the last digit of each number = **341**, 756, **963**, **363**, 863, 317, 944 = (341, 963, 363) , Therefore "3" will be correct answer

Sol.80.(d) Given number : 72514368

Number obtained by subtracting each digit of the number from 9 = 27485631
Even digit will be **4** in newly formed number

Sol.81.(d)
Given number : 3 5 4 6 9 8 3 2 9
ascending order : 2 3 3 4 5 6 8 9 9
(left) (right)
The positions of only 8 numbers change after they are arranged in ascending order.

Sol.82.(b) Two numbers are co-prime when H.C.F of the numbers is 1.
Value of y is less than 20, so y
= 1, 5, 7, 11, 13, 17, 19
So, there are 7 possible values of y.

Sol.83.(d) Smallest prime number is 2.

Sol.84.(c) Given : 167, 876, 567, 187, 873
After subtracting 11 from the number we get 156 , 865 , 556 , 176 , 862
After reversing the digit of numbers we get 651 , 568 , 655 , 671 , 268
After arranging the number in ascending order we get 268 , 568, 651 , 655 , 671
From the above we can clearly see that, Position of only one number got unchanged i.e. **568.**

Sol.85.(d) The sum of all prime numbers between 11 to 20 (both include)
11 + 13 + 17 + 19 = 60
The sum of all prime numbers between 30 to 50 (both include)
31 + 37 + 41 + 43 + 47 = 199
Now, required difference = 199 - 60 = 139

Sol.86.(a) The numbers between
$87^2 \; and \; 88^2 =$
$7569, 7570, 7571, \ldots\ldots\ldots 7743, \; 7744$
The non-square numbers
= $7570, \; 7571, \ldots\ldots\ldots\ldots\ldots 7743,$
Total number of terms
$= \frac{7743 - 7570}{1} + 1 = 173 + 1 = 174$

Sol.87.(a) The smallest number which is divisible by 8 , 12, 28, 36 i.e, its L.C.M.
L.C.M of 8,12,28 and 36 = 504

Sol.88.(b) Let the unit digit number be x and tenth place digit be y.
$x + y = 12 \ldots\ldots\ldots (1)$
$(10x + y) - (10y + x) = 18$
$\Rightarrow 10x + y - 10y - x = 18$
$\Rightarrow 9(x - y) = 18 \Rightarrow x - y = 2 \ldots\ldots\ldots\ldots (2)$
By solving eq, (1) and (2)
we get, x = 7 and y = 5
Hence, the required number = 10y + x = 57

Sol.89.(a) Let the first odd consecutive number be x. = $x^2 + (x + 2)^2 = 74$
$\Rightarrow x^2 + x^2 + 4 + 4x = 74$
$\Rightarrow 2x^2 + 4x - 70 = 0$
$\Rightarrow x^2 + 2x - 35 = 0$
$\Rightarrow x^2 + 7x - 5x - 35 = 0$
$\Rightarrow (x + 7)(x - 5) = 0 \Rightarrow x = 5 \; or \; -7$
Hence, the number = 5
Sum of the numbers = 5 + 7 = 12

Sol.90.(a) Let the unit digit be x and tenth place digit be y in the given number z.
$10y + x = 6(x + y)$
$\Rightarrow 10y - 6y + x - 6x = 0$
$\Rightarrow 5x - 4y = 0 \ldots\ldots\ldots (1)$
$(10y + x) - (10x + y) = 9$
$\Rightarrow 9y - 9x = 9 \Rightarrow y - x = 1 \ldots\ldots\ldots (2)$
By solving eq, (1) and (2) we get x = 4 and y = 5, Number will be 54

Sol.91.(b) Let the first number be x and the other number be y.
$(x + 1) + (y + 1) = 40$
$\Rightarrow x + y = 38 \ldots\ldots\ldots (1)$
$x - y = 6 \ldots\ldots\ldots, (2)$
By solving eq, (1) and (2) we get, x = 22 and y = 16
Hence, the numbers are 22 and 16.

Sol.92.(b) Let the first consecutive number be x and other number be x+1
$\frac{x}{4} - \frac{x+1}{5} = 3 \Rightarrow \frac{5x - 4x - 4}{20} = 3$
$\Rightarrow \frac{x - 4}{20} = 3 \Rightarrow x - 4 = 60 \Rightarrow x = 64$
Hence, the larger number is 65.

Sol.93.(b) All prime numbers are odd.

Sol.94.(c) Numbers between 1 to 10 both inclusive; 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Now, L.C.M of 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 = 2520 Hence, the required number is 2520

Sol.95.(b)
$4^{2n+1} = 2^{3n+9} \Rightarrow 2^{4n+2} = 2^{3n+9}$
$\Rightarrow 4n + 2 = 3n + 9 \ldots$
(If $m^a = m^b$ then a = b) $\Rightarrow n = 7$

Sol.96.(a) Let the three consecutive odd numbers be x, x + 2 and x + 4 .
$x + x + 2 + x + 4 = 309$
$\Rightarrow 3x + 6 = 309 \Rightarrow 3x = 303 \Rightarrow x$ = 101
Hence, the larger number is 105.

Sol.97.(c) Those natural numbers which only one common factor i.e 1.
By option, (161, 192) is a pair of co-prime number.

Sol.98.(b) Divisibility rule of 125 → if last 3 digit of any number divisible by 125 then the number will be divisible by 125
Possible value of last three digit
→ 125 , 250 ,375 , 500 , 625 , 750 ,875
For 473xy5 ,
possible value → 125 ,375 ,625 and 875
Therefore numbers = 4

Sol.99.(b) if any number is divisible by 44 it must divisible by 11 × 4
In this type question we go through option,
155232 = last two digit divisible by 4 and difference b/w odd and even place is 0 or multiple of 11 then, number is divisible by 11 ⇒ (1 + 5 + 3) - (5 + 2 + 2) = 0
156992 = last two digit divisible by 4 and difference b/w odd and even place is 0 or multiple of
11 (1 + 6 + 9) - (5 + 9 + 2) = 0

Sol.100.(a) x = 55^{100} + 55^{101} + 55^{102}
⇒x = 55^{100}(1 + 55 + 3025)
⇒ x = $55^{100} \times 3081$
According to option, only 71 prime number is not a factor of X.

Sol.101.(a) By hit and trial method ,
From option (a)
198 when divided by 15 remainder = 3
198 when divided by 17 remainder = 11 (satisfies)
Hence option (a) is the right answer

Sol.102.(d)
Required fraction = $\frac{45}{24 \times 60} = \frac{1}{32}$

Sol.103.(a) By hit and trial
From option (a), 1887 ÷ 17 = 111

Sol.104.(a) Let the number be a and b
According to the question,
a - b = 18.....(i), $a^2 - b^2 = 360$
(a + b) (a - b) = 360, (a + b) = 20.....(ii)
Possible value of a = 19 and b = 1
So, larger number = 19

Sol.105.(b) 1st multiple of 3 = 3
7th multiple of 3 = 21
Therefore average = $\frac{21 + 3}{2}$ = 12

Sol.106.(b) Numbers : 365, 125, 486, 548, 654, 552, 354
If 3 is added to first digit of every number, then, Numbers = 665, 425, 786, 848, 954, 852, 654, Numbers in which the first digit is exactly divisible by the second digit = 665, 425, 848
Hence, there are 3 such numbers.

Sol.107.(b) Biggest fraction = $\frac{5}{6}$
Smallest fraction = $\frac{1}{2}$
Required difference = $\frac{5}{6} - \frac{1}{2} = \frac{2}{6} = \frac{1}{3}$

Sol.108.(d) 705.0, 7.005, 7.500, 70.50, 7050, 7.050, 75
On arranging in ascending order,
7.005, 7.050, 7.500, 70.50, 75, 705.0, 7050

Sol.109.(a)
Prime numbers between 61 and 100 = 61, 67, 71, 73, 79, 83, 89, 97.
Second smallest prime between 61 and 100 = 67
Second largest prime between 61 and 100 = 89
Hence, required sum = 67 + 89 = 156

Sol.110.(d) LCM of 12, 16 and 18 = 144
Remainder = 5
So, required number = 144 + 5 = 149

Sol.111.(d)
Possible distinct prime numbers = 2, 7, 31
Required product = 2 × 7 × 31 = 434

Sol.112.(d)
ATQ, the fourth statement is true.
For divisibility of 4,
Last two digits should be divisible by 4

Sol.113.(b) 1 is a prime number (False)
All prime numbers except the number 2 are odd numbers.(True)
There are seven prime numbers between 1 and 20.(False)
If number x is prime, then number x + 1 is always prime. (False)

Sol.114.(c) The least value of x so that the number 478265475x + 25481459x is divisible by 8, is given by:
478265475x + 25481459x,
For divisibility of 8,
Last 3 digits should be divisible by 8.
Number = 478265475x
Possible value of x = 2
Number = 25481459x
Possible value of x = 2
478265475x + 25481459x
Now, Go through last 3 digits,
752 + 592 = 1344
So, least value of x = 2

Sol.115.(a) $2^2 = 4$ and $3^2 = 9$
So, total integers between 2^2 and 3^2
= (9 - 4) - 1 = 4 = $3^2 = 9$ and $4^2 = 16$
So, total integers between 3^2 and 4^2
= (16 - 9) - 1 = 6
Integers lying between 891^2 and 892^2
= $(892^2 - 891^2)$ - 1 = (892 - 891)(892 + 891) - 1 = 1783 - 1 = 1782

Sol.116.(d) According to question,
⇒ 8a + 8b = 56 ⇒ 8(a + b) = 56
a + b = 7
Possible value a and b = 3 and 4
Numbers are 24 and 32
Greater number = 32

Sol.117.(d)
Let the original number be : 10x + y
According to the question,
$\frac{1}{7}(10x + y) = \frac{10x + y}{2} - 15$
$20x + 2y = 70x + 7y - 210$
$50x + 5y = 210 \Rightarrow 10x + y = 42$
So, sum of digits = 4 + 2 = 6

Sol.118.(a) ATQ, $x^2 = 5x + 6$
Going with options we get option (a) = 6 satisfies this.

Sol.119.(d) Let the two number = a and b
So, a + b = 17 and $a^2 + b^2 = 157$
Short trick:-
Put a = 11 and b = 6
Sum of cubes = $a^3 + b^3 = 11^3 + 6^3$
= 1331 + 216 = 1547

Sol.120.(d) As per question,
$P \times \frac{3}{4} - Q \times \frac{2}{3} = \frac{5}{8}$
$\frac{3P}{4} - \frac{2Q}{3} = \frac{5}{8}$
$\frac{9P - 8Q}{12} = \frac{5}{8} \Rightarrow 9P - 8Q = \frac{15}{2}$

Sol.121.(a) LCM of 7, 11 and 13 = 1001
$(1001)^2 = 1002001$
So, option (a) is divisible by 7, 11 and 13.

Sol.122.(b)
Dividend = divisor × quotient + remainder
Dividend = 22.8 × 8.5 + 0 = 193.8

Sol.123.(a) Let total number of pencils= x
No of coloured pencils = $\frac{3}{4}$ x
No of red coloured pencils
$= \frac{3}{4}x \times \frac{8}{15} = \frac{2}{5}x$
$\Rightarrow \frac{2}{5}x = 40 \Rightarrow x = 100$
So total number of pencils = 100

Sol.124.(b)
There are 96 pencils in 12 packets.
Then, 1 pencil in $\frac{12}{96}$ $packets$
So,304 pencils in
$\frac{12}{96} \times 304 = 38\ packets.$

Sol.125.(a)
13.5 kg of grapes cost ₹681.75
1 kg of grapes cost = $\frac{681.75}{13.5}$
12 kg of grapes cost
= ₹$\frac{681.75}{13.5} \times 12$ = ₹606

Sol.126.(b) Let the positive integer be n.
n is divided by 7 leaves remainder as 3;
n leaves 0 as the remainder when 4 is added to n i.e. n + 4

Sol.127.(c)
$\frac{37}{92.5} = \frac{16}{y} \Rightarrow y = \frac{92.5 \times 16}{37} = 40$

Sol.128.(c) $y = \frac{460.8}{16} = 28.8$
Now, $\frac{28.8}{16} = 1.8$

Sol.129.(c)
Number = $\frac{243}{0.225 \times 0.36} = 3000$

Sol.130.(d) By option; 10098
$\Rightarrow \frac{1 + 9 + 8}{9} = 2$
$Hence,\ it\ is\ divisible\ by\ 9$
Add alternate digits of the number and find the difference which should be divided by 11.
So, (1 + 0 + 8) - (0 + 9) = 0, which is divisible by 11.
Hence, it is divisible by 11.

Sol.131.(c) We will get the unit digit of
4 × 38 × 764 × 1256 if we just multiply the last digits of each numbers.
i.e. 4 × 8 × 4 × 6 = 768
So, the unit digit in 4 × 38 × 764 × 1256 is 8.

Sol.132.(d) As we know,
for any natural number n, 6^n always ends with 6 and 5^n ends with 5.
So, $6^n - 5^n$ will end with (6 - 5) = 1.

Sol.133.(c) The mean of the first eight composite natural numbers = $\frac{78}{8}$
The mean of the first eight prime numbers = $\frac{77}{8}$
So, the required difference = $\frac{78}{8} - \frac{77}{8}$
= $\frac{1}{8}$

Sol.134.(d) The multiples of 12 just after 100 is 108, and just near 200 is 192.
So the multiples of 12 between 100 and 200 forms an arithmetic progression with first term (a) = 108, common difference (d) = 12, last term (l) = 192
So the sum of all the numbers between 100 and 200 which are divisible by 12,
= $\frac{n}{2}$ (a + l) [where n = 8]
= $\frac{8}{2}$ (108 + 192) = 1200

Sol.135.(a) In case of the number 0.232323, we can see it is a pure

recurring number and '23' is repeated successively. So the bar will be above 0.23, i.e denominator will be 99 and the numerator will be 23. So, if we convert it into a fraction it will be = $\frac{23}{99}$

Sol.136.(b) 1 + 3 + 7 + 9 + 11 + 13 = 44
As we know, the perfect square number means such numbers whose square roots come to be an integer number. So, perfect squares near 44 are 36 and 49.
Now, 44 + 5 = 49
So, the number that should be added to 44 to make it a complete square is 5.

Sol.137.(b) Given, quotient
= 6 and remainder = 5
Let smaller number = a (Divisor)
bigger number = b (Dividend)
From question, b - a = 1540 ----(1)
We know that,
Dividend=Divisor × Quotient + Remainder
b = a × 6 + 5
b - 6a = 5 ----(2)
Subtract equation (2) from (1),
we get, 5a = 1535
∴ a = $\frac{1535}{5}$ = a = 307

Sol.138.(c) The greatest number of 5 digits = 99999
When we divide 99999 by 468, we get 315 as remainder.
So, the required 5-digit number which is divisible by 468 is
= 99999 - 315 = 99684

Sol.139.(c) If the denominator of a rational number is of the form 2^n5^m, where n and m are non-negative integers, then the decimal expansion of the number will definitely be a terminating decimal. i.e. a decimal number which has all terms zero, after some places on the right side of the decimal place.
E.g. $\frac{7}{20} = \frac{7}{2^2 \times 5^1} = 0.35$
[here both n, m are non-negative integers and the result is a terminating decimal number]

Sol.140.(a) Prime factors of 21600
$= 5^2 \times 2^5 \times 3^3 \Rightarrow (5^2 \times 2^4 \times 3^2) \times (2 \times 3)$
Now, we have to take only even powered factors to find the perfect square factors,
$\Rightarrow 5^2 \times 2^4 \times 3^2 = (5^2)^1 \times (2^2)^2 \times (3^2)^1$
So, the number of factors for this part
= (1 + 1) × (2 + 1) × (1 + 1)
= 2 × 3 × 2 = 12
i.e. 12 factors of the number 21600 are perfect squares.

Sol.141.(c) Out of the four given statements only the statement, every real number can be written in the complex form is true. As we know, complex numbers are written as → a + ib form.
Now, any real number can be written in this form by making the part b = 0,
e.g. the real number $5 = 5 + i \times 0$

Sol.142.(a) The numbers from 2 to 12 are = 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 (11 numbers) , Composite numbers are
= 4, 6, 8, 9, 10, 12 (6 numbers)
Required fraction = $\frac{6}{11}$

Sol.143.(b) A + 0 = 0 + A = A
This is the additive property of zero.

Sol.144.(a) Let the consecutive odd integers are x, x + 2.
As the difference between squares of two consecutive positive odd integers is 56. $\Rightarrow (x+2)^2 - x^2 = 56 \Rightarrow x = 13$
Then the two consecutive odd integers are 13 and 15.

Sol.145.(c) The number is = n,
When n is divided by 5, the remainder is 2.
⇒ n = 5q + 2 [where q is the quotient]
Squaring both sides we get,
$\Rightarrow n^2 = 25q^2 + 20q + 4$
Here, the part $25q^2 + 20q$ is divisible by 5, So, when $n^2$is divided by 5, the remainder will be 4.

Sol.146.(c) Decimal expansion of $\frac{109}{100}$ is
$= \frac{109}{100} = 1 + \frac{0}{10} + \frac{9}{100}$

Sol.147.(c) $\frac{15}{600}$ = 0.025
⇒ It is a terminating decimal because this decimal has a finite number of digi
$\frac{29}{343}$ = 0.08454.....[it is a non terminating decimal] $\frac{7}{2^2 \times 7^2} = \frac{7}{196}$ = 0.03571.....
[it is a non terminating decimal]
$\frac{77}{210}$ = 0.36666.....[it is a non terminating decimal]

Sol.148.(a) The product of two even consecutive numbers is always divisible by 8.
Examples-
2 × 4 = 8, 4 × 6 = 24, 6 × 8 = 48 etc

Sol.149.(a) Let the three consecutive numbers be x, x + 1, x + 2
ATQ,
2x + 3 (x + 1) + 4(x + 2) = 74
⇒ 9x + 11 = 74 ⇒ 9x = 63 ⇒ x = 7
∴ Greater number = x + 2 = 7 + 2 = 9

Sol.150.(a) Any number which is divisible by 4, 8, 12 and 16 must be divisible by 3, 4 and 8. If the last 3 digits of any number are divisible by 8, then the number is divisible by 8.
So, from given options only 100032 and 100800 are divisible by all but the smallest number of 6 digits will be 100032.

Sol.151.(c) $3^{71} + 3^{72} + 3^{73} + 3^{74} + 3^{75}$
$= 3^{71}(1 + 3 + 3^2 + 3^3 + 3^4)$
$= 3^{71}(1 + 3 + 9 + 27 + 81) = 3^{71} \times 121$
This will be divisible by 11.

Sol.152.(a)
Let both the numbers be, a and b.
ATQ, $a^2 + b^2 = 2437$ -----(1)
And $\sqrt{a} = 7$ -----(2)
Squaring both sides we get,
$a = 49 \Rightarrow a^2 = 2401$
From equation (1),
$2401 + b^2 = 2437$
$\Rightarrow b^2 = 2437 - 2401 = 36 \Rightarrow b = 6$

Sol.153.(d) $0.0\overline{37} = \frac{(37-3)}{900} = \frac{17}{450}$

Sol.154.(d) Odd numbers from 3 to 60, that are exactly divisible by 5 are : 5, 15, 25, 35, 45, 55 i.e. 6 numbers.

Sol.155.(c)
Let the two digit number be 10x + y,
So x + y = 6,
According to the question,
2 (10x + y) - (10y + x) = 6
⇒ 19x - 8y = 6 ⇒19 (6 - y) - 8y = 6
⇒ y = 4 & x = 2
So, the number is 24.

Sol.156.(c) The numbers which are divisible by 7 between 300 to 1000 are 301, 308 - - - - - - 994.
First term(a) = 301, last term(l) = 994, difference(d) = 7
n^{th} number = $(\frac{l-a}{d}) + 1$
$= (\frac{994-301}{7}) + 1 = 99 + 1 = 100$

Sol.157.(a) Let the number = xy
A/Q,
x + y = 9 ⇒ y = 9 - x ----- (1)
When the digits are reversed new number
= yx ⇒ 10y + x + 9 = 3 (10x + y)
⇒ 10y + x + 9 = 30x + 3y
⇒ 7y - 29x + 9 = 0 ----- (2)
Put y = 9 - x in equation (2)

⇒ 7 (9 - x) - 29x + 9 = 0
⇒ 63 - 36x + 9 = 0 ⇒ 72 = 36x ⇒ x = 2
From eq . (1)
y = 7 Number = 27

Sol.158.(c) A number is divisible by 1 and itself are numbers from 3 to 29 are 3 , 5 , 7 , 11 , 13 , 17 , 19 , 23 and 29 .
Total = 9 no. are there.

Sol.159.(d) Let the sum of all even integers from 2 to 281 is = S ;
It is an Arithmetic progression series with a = 2, d = 2, l = 280;
Where n = number of terms
$= \frac{l-a}{d} + 1 = 140$
So, S = $\frac{140}{2} \times (280 + 2) = 19740$

Sol.160.(b) The fractions are given as :
$\frac{2}{5}, \frac{1}{3}, \frac{3}{5}, \frac{1}{4}, \frac{7}{10}, \frac{5}{8}$
To arrange it in ascending order the denominators should be made equal to compare among them.
$\Rightarrow \frac{48}{120}, \frac{40}{120}, \frac{72}{120}, \frac{30}{120}, \frac{84}{120}, \frac{75}{120}$
So, the ascending order will be :
$\frac{1}{4}, \frac{1}{3}, \frac{2}{5}, \frac{3}{5}, \frac{5}{8}, \frac{7}{10}$

Sol.161.(d) Let the four consecutive odd numbers are x, x + 2, x + 4, x + 6 ;
So, the sum of these four consecutive odd numbers is :
x + x + 2 + x + 4 + x + 6 = 160
⇒ 4x + 12 = 160 ⇒ x = 37

Sol.162.(a) Let the number is = 10x + y ;
The sum of the digits of a two-digit number is 5 ⇒ x + y = 5 ;
If the digits are reversed, the new number when increased by 1 equals three times the original number.
10y + x +1 = 3(10x + y)
29x = 7y + 1 → 29(5–y) = 7y + 1
⇒ 36y = 144 ⇒ y = 4 ;
So, x = (5 - 4) = 1 ;
Then the number is (10 × 1 + 4) = 14

Sol.163.(c)
Let the number of students = x
A/Q,
$\frac{9000}{x} - \frac{9000}{x+20}$ = 160
$\Rightarrow \frac{9000(x+20) - 9000x}{x(x+20)}$ = 160
$\Rightarrow \frac{180000}{x(x+20)}$ = 160
⇒ x(x + 20) = $\frac{180000}{160}$ = 1125
⇒ x(x + 20) = 25 × 45
On comparing, x = 25

Sol.164.(a)
Numbers are = 55, 65, 75, 85, 95

Sol.165.(d) $\frac{N}{5}$ ⇒ Rem. = 3
$\frac{N^2}{5}$ ⇒ Rem = $\frac{3^2}{5} = \frac{9}{5}$ = 4

Sol.166.(d) for no. of trailing zeroes
$[\frac{n}{5^1} + \frac{n}{5^2} + \frac{n}{5^3} .....]$
Number of Zeros in 19!
$= \frac{19}{5} = 3\ (integer\ part)$
So a hundredth place digit of 19! Would be 0.

Sol.167.(b) LCM of 12, 21, 32, 18
= 2016 2016 × 3 = 6048 which lies between 6000 and 7000.

Sol.168.(b) Greatest no. of 4 digit = 9999
When we divide 9999 by 307 leaves remainder = 175,
So number = 307 - 175 = 132

Sol.169.(a) 1 + 2 + 3 +. . .+ 30 + 31 + 30 + 29 +. . .+ 3 + 2 + 1
$= \frac{31 \times 32}{2} + \frac{30 \times 31}{2}$
= 31×16 + 31×15 = 31 × 31 = 961

Sol.170.(d) Let the four consecutive numbers be x, x + 1, x + 2, x + 3
A/Q, x + x + 1 = x + 3
⇒ 2x + 1 = x + 3 ⇒ x = 2
Numbers are 2, 3, 4, 5
Sum = 14, Half of sum = 7

Sol.171.(b) Given number = 61827354
Face value of 6 = 6
Face value of 5 = 5
Sum = 6 + 5 = 11

Sol.172.(a) Let the number = x
A/Q, x + 14x = 135
⇒ 15x = 135 ⇒ x = 9

Sol.173.(a) 1.112123123412345 is an irrational number because 1234 is repeating after decimal.

Sol.174.(a) 45 is divisible by 15 so the number which is divisible by 45 will be also divisible by 15 , we need to check only the remainder.
When we divide 28 by 15 ,
Remainder = 13

Sol.175.(c) 4660 - 1300 = 3360
6900 - 4660 = 2240
HCF of 2240 and 3360 = 112
N = 112
Sum of digits = 1 + 1 + 2 = 4.

Sol.176.(b) $\frac{(3\sqrt{5} + \sqrt{125})}{(\sqrt{80} + 6\sqrt{5})}$
= $\frac{(3\sqrt{5} + 5\sqrt{5})}{(4\sqrt{5} + 6\sqrt{5}} = \frac{8\sqrt{5}}{10\sqrt{5}}$
= $\frac{4}{5}$ (Rational number)

Sol.177.(a)
Let the two numbers are N and M.
One fourth of N is equal to three- eighth of M.⇒ $\frac{N}{4} = \frac{3M}{8} \Rightarrow M = \frac{2N}{3}$
If 30 is added to the first number, then it becomes six times that of the second number.
$\Rightarrow N + 30 = 6 \times M$
$\Rightarrow 3N = 30 \Rightarrow N = 10$
So, the first number is 10.

Sol.178.(d) 4, 8, 16, 32, --------512.
This series is in Geometric Progression, where a = 4, r = 2, l = 512 ;
$\Rightarrow l = a \times r^{n-1} \Rightarrow 2^{n-1} = 2^7 \Rightarrow n = 8$

Sol.179.(d) If we observe the given number we find that the nearest number to 327 which would be a perfect square is 324.
So 0.000327 - 0.000324 = 0.000003

Sol.180.(a) $4^{61} + 4^{62} + 4^{63} + 4^{64}$
= $4^{61}(1 + 4 + 4^2 + 4^3)$
= $4^{61}(1 + 4 + 16 + 64)$
= $4^{61} \times 85$, = $4^{60} \times 340$
Divisible by 10.

Sol.181.(a) The number which is divisible by 280 will also be divisible by 35. So we have to check only the remainder.
$\frac{73}{35}$ ⇒ Remainder = 3

Sol.182.(d) Let the Number = x
A/Q, x - 3 = $\frac{28}{x}$
$\Rightarrow x(x-3) = 28 = 7 \times 4$
On comparing we get x = 7

Sol.183.(d) Let the bigger number = x
As per the question, x - 40 = $\frac{x}{5}$
$\Rightarrow x - \frac{x}{5} = 40 \Rightarrow \frac{4x}{5} = 40 \Rightarrow$ x = 50

Sol.184.(d) On comparing all, the greatest rational number = $\frac{19}{27}$
So this will be the greatest ratio.

Sol.185.(b)

2	$\overline{63}\overline{53}\overline{5}$	252
2	4	
45	235	
5	225	
502	1035	
2	1004	
504	31	

31 must be subtracted from 63535 to make it a perfect square.

Sol.186.(b) 99.75 × 0.05554 = 5.540115
6 digits will be here to the right of the decimal.

Sol.187.(c)
Greatest number of four digit = 9999
When we divide 9999 by 307 we get 175 as Remainder.
Required number = 307 - 175 = 132

Sol.188.(d)

1	$1\overline{25}\overline{19}$	112
1	1	
21	025	
1	21	
222	419	
2	444	
	25	

Sol.189.(b) The number whose only factors are 1 and the number itself is called a Prime number.
e.g. 2,3,5,7,.....

Sol.190.(a)
If 111.....1 (n digits) is divisible by 9,
Then the value of n will be = 9
Because as we know to be divisible by 9, the sum of the digits has to be = 9 or a multiple of 9.
Here (1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1) = 9
So, the least value of n = 9

Sol.191.(d) There are two 9's in 96961
Their place values are = 90000 and 900
Sum = 90000 + 900=90900

Sol.192.(b) LCM of 6,8, 12, 15 and 20 is = 120
The greatest number of 5 digit = 99999
When 99999 ÷ 120 then the remainder is 39
If we subtract 39 from 99999, then number becomes divisible by 120
99999 - 39 = 99960 is exactly divisible by 120.

Sol.193.(c) A terminating decimal is always a rational number As it can be represented by p/q form.

Sol.194.(b) $\frac{31}{2.5}$ = 12.4

Sol.195.(c) The product of $4\sqrt{6}$ and $3\sqrt{24}$ is 144 and it's a rational number.

Sol.196.(c) On solving the term
$(\sqrt{2} - \sqrt{3})^2 = 2 + 3 - 2\sqrt{6}$
is obtained and this is an irrational term.

Sol.197.(a) $\frac{3}{8} = 0.375$ i.e. the decimal expression of $\frac{3}{8}$ comes to an end after 3 digits, after the decimal.

Sol.198.(c) $0.\overline{23} = \frac{23}{99}$ ⇒ It is a rational number because it can be written in the fraction of two integers($\frac{P}{Q}$)

Sol.199.(a)
$The\ rational\ number\ between$
$\sqrt{5} \simeq 2.24\ and\ \sqrt{7} \simeq 2.65 = 2\frac{2}{5} = 2.4$

Sol.200.(c) Let the number is = N ;
According to the question,
$\Rightarrow \frac{N}{5 \times 3} = 3 \times \frac{1}{2} \times \frac{40}{10} \Rightarrow$ N = 90

Sol.201.(b)
$\sqrt[3]{40} = \sqrt[3]{2 \times 2 \times 2 \times 5} = 2 \times \sqrt[3]{5} = 2 \times 5^{\frac{1}{3}}$
The rationalizing factor of an irrational number is a number that must be multiplied by that irrational number to make it rational.
There might be many rationalizing factors of an irrational number but we must find the simplest number that must make it rational when multiplied by it.
To make $\left(2 \times 5^{\frac{1}{3}}\right)$ rational , we have to multiply it by $(5^{\frac{2}{3}})$

Sol.202.(a) The greatest prime number less than 200 = 199
Because prime numbers are a number that can be divided exactly only by itself and 1, for example 7, 17 , 41 and 199 etc.

Sol.203.(c) According to the question,
$= \frac{2}{11} \times$ (reciprocal of - $\frac{5}{14}$)
$= \frac{2}{11} \times -\frac{14}{5} = -\frac{28}{55}$

Sol.204.(a) $3 = \sqrt{9}\ and\ 5 = \sqrt{25}$
If we find irrational numbers between 3 and 5, it means that the number lies between $\sqrt{9}\ and\ \sqrt{25}$.
$\sqrt{17}\ lies\ between\ \sqrt{9}$ and $\sqrt{25}$

Sol.205.(b) $\frac{2}{7} = 0.\overline{285714}$
$\frac{2}{5} = 0.4$, $\frac{2}{3} = 0.\overline{6}$, $\frac{2}{9} = 0.\overline{2}$
Hence, We can see that only $\frac{2}{5}$ has terminal decimal.

Sol.206.(c) integers are numbers that can be positive, negative or zero, but cannot be a fraction.

Sol.207.(c) 2, 3 , 5, 7 , 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47 are the prime numbers that are less than 50.

Sol.208.(a) Given number = 71,624
Place value of 7 = 70,000

Sol.209.(a)
Let the numbers be x, x + 2, x + 4, x + 6
A/Q, x + x + 2 + x + 4 + x + 6 = 484
⇒ 4x + 12 = 484 ⇒ 4x = 472
⇒ x = $\frac{472}{4} = 118$ (Smallest no.)

Sol.210.(a) The given number = 3,15,298
Face value of 9 = 9
Face value of 3 = 3
Difference = 9 - 3 = 6

Sol.211.(a) Let the initial number = x
A/Q, $x^2 - 15 = (x - 15)^2$
$\Rightarrow x^2 - 15 = x^2 + 225 - 30x$
$\Rightarrow 30x = 240 \Rightarrow x = 8$

Sol.212.(a) The sum of first 'n' natural numbers = $\frac{n(n+1)}{2}$

Sol.213.(c) A/Q N÷5 = 3
Example, 8 ÷ 5 = 3, 13 ÷ 5 = 3

Sol.214.(c) Let number = x
A/Q ,⇒ $\frac{x}{2} = 2 \Rightarrow x = 4$
actual answer = $2x = 2 \times 4 = 8$

Sol.215.(c)
Difference between 1000 and 200 = 800
800 is divided by 7 then we get 114 as complete value and the remainder is 2 so that 114 numbers between 200 to 1000 are completely divisible by 7.

Sol.216.(a) We know that when 'm' is an odd number ($x^m + a^m$) is divisible by (x + a). Each one is divisible by (41 + 43).
So Common factor = (41 + 43) = 84.

Sol.217.(a) In 516372 , face value of 6 = 6 and place value of 6 = 6000
Difference between the place value and face value of 6 in 516372 = 6000 ₋ 6 = 5994

Sol.218.(b)
Greatest six digits number = 999999
Smallest six digits number = 100000

Difference between greatest and smallest = 999999 - 100000 = 899999

Sol.219.(a) The smallest number divisible by 6, 12 and 18 → LCM(6,12,18) = 36
when largest 4-digit number is divided by 36 it gives quotient 277 and
Remainder 27
So, the number is 9999 - 27 = 9972
ATQ,
The required number is 9972 + 5 = 9977

Sol.220.(c) Largest 3-digit number = 999
Largest 4-digit number = 9999
Difference = 9999 - 999 = 9000
Numbers divisible by 5 = $\frac{9000}{5} = 1800$

Sol.221.(c) How many 3-digit numbers leave remainder 1 when divided by 7
First such number is 105 + 1 = 106
Last such number is 994 + 1 = 995
AP with d = 7 , a(First term) = 106, l (last term) = 995, Then n = ?
So, 106 + (n - 1) × 7 = 995
n = $\frac{889}{7}$ + 1 = 128

Sol.222.(d) Any number divided by 2 and 3 then number is divided by 6
Divisibility of 6 = 3 × 2
Every option is an even number. So, We only have to check the divisibility by 3.
→ 87937A = 8 + 7 + 9 + 3 + 7 + A = 7 + A
Here, we need the least value of A.
So, 2 is the correct answer.

Sol.223.(c) The face values of 8 and 5 in the number 817354 = 8 and 5
The sum of the face values - 13
[NOTE - Face value is the actual value of a digit in a number.]

Sol.224.(d) When we divide square of same number the remainder
= $\frac{4^2}{7} = \frac{16}{7}$ = 2

Sol.225.(b) 1st term = a = 2
Common difference = d = 7 - 2 = 5
10th term of AP = 2 + (10 - 1) × 5 = 47

Sol.226.(b) Place value of 5 = 50000000
= 5× 10^7

Sol.227.(b)
Unit digit of $9^{odd} = 9\ and\ 9^{even} = 1$
$\Rightarrow cyclicity = 2$
19^{300} = 19^{even} ⇒ unit digit = 1
So when we divide 19^{300} $by\ 20$, $we\ get\ remainder = 1$

Sol.228.(d)
Total numbers between 1 to 700 = 700
When we divide 700 by 17 we get quotient = 41
So 41 numbers are divisible by 17.

Sol.229.(a) Let the numbers be x and y
A/Q, x + y = 30
And xy = 50
Now, $\frac{1}{x} + \frac{1}{y} = \frac{x+y}{xy} = \frac{30}{50} = \frac{3}{5}$

Sol.230.(a) Let the original fraction = $\frac{x}{y}$
A/Q, y - x = 5 ---------- (1)
$\frac{x-2}{y+2} = \frac{2}{5}$
$\Rightarrow 5x - 10 = 2y + 4$
$\Rightarrow 5x - 2y = 14$ --------- (2)
On solving equation (1) and (2), we get
$x = 8\ and\ y = 13$
Fraction = $\frac{8}{13}$
Alternate :- In only option (a), The numerator is 5 less than its denominator. So, It is the correct answer.

Sol.231.(d) 1216 - 32D = DDD
1216 is divisible by 8 so 32D should also be divisible by 8 then the result DDD will be divisible by 8.
For 32D , D should be equal to 8

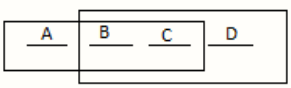
Sol.232.(d) 67843A2 is divisible by 11
Sum of odd place digits - the sum of even place digits = 0 or a multiple of 11
= 19 - (11 + A) = 8 - A =0
So, A = 8

Sol.233.(a) Let, small number = X and larger number = Y
ATQ, Y = X + 5 ⇒ Y - X = 5------(i)
X + Y = 19 ------(ii)
Solving the equation (i) & (ii)
We get the value of Y = 12 and X =7
The product of these numbers
= XY =12 × 7 =84

Sol.234.(b) Let , number = x
A/Q
[3 < x < 8] and [6 < x < 10]
Only, [6 < x< 8] is possible
So that the number is 7

Sol.235.(c) Factorization of 6250
= 2 × 5 × 5 × 5 × 5 × 5
When 6250 is multiplied by 2 × 2 × 5 then 6250 will be a perfect cube.
So, the required number = 2 × 2 × 5 = 20

Sol.236.(c)



$\frac{B \times C \times D}{A \times B \times C} = \frac{7429}{4199}$
→ $\frac{D}{A} = \frac{23}{13}$
So , the largest prime no. is 23 .

Sol.237.(a) $2^7 \times 3^3 \times 5^4 \times 7$
Even number of factors =
$7 \times (3+1)(4+1)(1+1)$
$=7 \times 4 \times 5 \times 2 = 280$

Sol.238.(a) $9^2 = 81\ and\ 10^2 = 100$
And 90 lies between 81 and 100 so its square root must lie between 9 and 10.

Sol.239.(c) Put x = 72
$\frac{136}{x-4} = \frac{136}{72-4} = \frac{136}{68} = 2$
Put x = -132
$\frac{136}{x-4} = \frac{136}{-132-4} = \frac{136}{-136} = -1$
Put x = - 268$\frac{136}{x-4}$
$= \frac{136}{-268-4} = \frac{136}{-272}$
$= -\frac{-1}{2} \neq integer$
The lowest value of x = - 132

Sol.240.(b) Prime numbers between 50 and 60 = 53, 59,
Sum = 53 + 59 = 112

Sol.241.(c) Perfect squares can't end with 2 , 3 , 7 and 8 .

Sol.242.(d) LCM of 6 and 8 = 24
Numbers which are divisible by both 6 and 8 must be divisible by 24
Total numbers divisible by both 6 and 8 = $\frac{100}{24} = Quotient = 4$

Sol.243.(c) Rational number between $\frac{1}{4}$ and $\frac{1}{2} = \frac{\frac{1}{4}+\frac{1}{2}}{2} = \frac{3}{8}$

Sol.244.(d) Let the middle digit be x Then 2x = 18 or x = 9 So, the number is either 396 or 693 and another pair is 594 or 495 Since the number increases on reversing the digits, so the hundred's digits is smaller than the units digit Hence, required number is 396 because difference of 594 and 495 is not 297

Sol.245.(c) Concept →the smallest four digit number is 1000
Now , LCM of 2 ,3 and 5 = 30
When we divide 1000 by 30 we get 10 as the remainder.
The smallest four digit number which is divisible by 2 , 3 and 5 = 1000 -10 +30 =1020, the smallest 4-digit number which

when divided by 2, 3 and 5 leaves a remainder of 1 in each case = 1020 + 1 = 1021

Sol.246.(d) Let , number = X , then
A/Q, X^2- X = 812
X(X - 1) = 812, 29 × 28 = 812

Sol.247.(a) A/Q,
factors of $2^2 \times 3^1 \times 5^2 \times 7^1$ are divisible by 50 but not by 100
(i) 25 × 2 (ii) 25 × 2 × 3 (iii) 25 × 2 × 7 (iv) 25 × 2 × 7 × 3
Possible numbers- 4
We will not take '2' twice because it will be a multiple of 100.

Sol.248.(b)
120 = 2 × 2 × 2 × 3 × 5 = $2^3 \times 3 \times 5$
Number of total factors
= (3 + 1)(1 + 1)(1 + 1) = 4 × 2 × 2 = 16
Number of even factors
= $3 \times 2 \times 2 = 12$
Number of divisors = no. of factors
Number of even divisors = 12
Number of odd divisors = 16 - 12 = 4

Sol.249.(d) - 0.96, - 0.64, 0.24, 0.58, 0.83

Sol.250.(d) LCM of (21, 35, 63) = 315
Number should be divisible by 315
Now, $\frac{10000}{315} = 31(Quotient)$

Sol.251.(c) $2^3 \times 3^3 \times 5^4 \times 7^2$
No. of factors divisible by 50 =
$5^2 \times 2\ (2^2 \times 3^3 \times 5^2 \times 7^2)$
→ 3×4× 3×3 = 108
No. of factors divisible by 100 =
$5^2 \times 2^2\ (2 \times 3^3 \times 5^2 \times 7^2)$
→ 2×4× 3×3 = 72
Required no. of factors = 108 - 72 = 36

Sol.252.(a) 120 = $2^3 \times 3 \times 5$
Number of factors = $(3 + 1) \times (1 + 1) \times (1 + 1) = 4 \times 2 \times 2 = 16$

Sol.253.(a) Given that Remainder = 8
A/Q, Divisor = $6 \times 8 = 48$
Quotient = 24 Dividend
= Divisor × Quotient + Remainder
= $48 \times 24 + 8$, = 1160

Sol.254.(b) Let the number = x
A/Q, $\frac{4x}{5} - \frac{3x}{4} = 4 \Rightarrow \frac{16x - 15x}{20} = 4$
$\Rightarrow \frac{x}{20} = 4 \Rightarrow x = 80$

Sol.255.(b)
Let, the numbers are " a "and " b "
A/Q , a + b = 40 and a × b = 60
$\frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{40}{60} = \frac{2}{3}$

Sol.256.(b) sum of the cubes of the natural numbers from 5 to 14
= $5^3 + 6^3 + 7^3 + 8^3$ ..... 14^3 = 10925

Sol.257.(a) smallest five -digit number formed by using the digits 2, 3 ,4, 0, 5
= 20345

Sol.258.(b)
6 digit greatest number = 999999
and 6 digit smallest number = 100000
Difference between them = 899999

Sol.259.(a) $a^2 + b^2 + c^2 + d^2 = 1$
Put a = b = c = d = $\frac{1}{2}$ satisfies the given equation, abcd
= $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{16}$

Sol.260.(a)
Smallest 6-digit number = 100000
Largest 4-digit number = 9999
100000 - 9999 = 90001

Sol.261.(a) Descending order of numbers divisible by 2 from 1 to 26
26, 24, 22, 20, 18, 16, 14, 12 , 10, 8, 6, 4 2, Number which will be at the 9th from the bottom = 18

Sol.262.(d) Sum of squares of natural numbers = $\frac{n(n+1)(2n+1)}{6}$
= $\frac{12 \times 13 \times 25}{6}$ = 650

Sol.263.(a) $\sqrt{4225}$ = 65
so that , $\sqrt{42.25}$ = 6.5

Sol.264.(b) $\frac{5}{100} + \frac{2}{5} - \frac{6}{25}$
= $\frac{5 + 40 - 24}{100}$ = 0.21

Sol.265.(c) 109 and 113 are two integers and they are prime between 109 and 121.(Including 109 and 121)

Sol.266.(c)
six digits greatest number = 999999 and six digit smallest number = 100000
The sum of the greatest and smallest numbers of six digits = 1099999

Sol.267.(c) 15971 = $x \times 55 + 21$
15950 = $x \times 55 \rightarrow x = 290$

Sol.268.(d) smallest four digit number formed by using the digits 3, 5, 0, 6
= 3056

Sol.269.(b) $1^3 + 2^3 + 3^3 + 4^3 + 5^3 + 6^3 + 7^3 + 8^3 + 9^3 + 10^3$ = 3025 Or
Sum of cubes of natural numbers
= $(\frac{n(n+1)}{2})^2 = (\frac{10 \times 11}{2})^2 = (55)^2$ = 3025

Sol.270.(a) $\frac{Boys}{total\ students} = \frac{58}{100}$ = 0.58

Sol.271.(c) 1st term (a)
= 5, common difference (d) =4
9th term of AP = a + (n - 1)d
= 5 + (9 - 1)× 4 ⇒ 5 + 32 = 37

Sol.272.(c) Both statements are incorrect.

Sol.273.(b) Nearest square of 40125 is 40000 = $(200)^2$
Soldier left = 40125 - 40000 = 125

Sol.274.(b)
Every integer is a rational number.

Sol.275.(a) Hundreds place = 2
Unit place = 2 × 2 = 4
Thousand place = 0
Ten thousand place = 6, Ten place = 5
So that , Number = 60254

Sol.276.(d) When 294 is multiplied with 6 then we have a perfect square .
294 × 6 = 1764 , $\sqrt{1764}$ = 42

Sol.277.(a) BA × B3 = 57A
By the option
Only A = 5 , B = 2 is satisfied by the given equation.

Sol.278.(c) 91 × 92 × 93 × .....× 99
When 2 of 92 and 5 of 95 are multiplied it will make 10. Now any number multiplied with 10, its unit digit will be 0.

Sol.279.(d) Number which are divisible by 3 , from 1 - 30
3, 6, 9,12,15 ,18 21 ,24 ,27,30
Now in descending order
30, 27, 24, 21, 18, 15, 12, 9, 6, 3
7th from the bottom = 4th from the top
Number = 21

Sol.280.(b) Sum of squares from 1 to 18
= $\frac{18 \times (18+1)(2 \times 18+1)}{6}$
= $\frac{18 \times 19 \times 37}{6} = 2109$
Sum of squares from 3 to 18
= 2109 - 1 - 4 = 2104

Sol.281.(a) Smallest 6-digit number formed using 0,4 and 6 = 400006
Largest 6-digit number formed using 0, 4 and 6 = 666640
Sum = 666640 + 400006 = 10,66,646

Sol.282.(b) Let , number = x

$\{x+(\frac{1}{3}-\frac{1}{4})\}-(\frac{1}{3}\times\frac{1}{4})=(\frac{1}{3}+\frac{1}{4})$

$\{x+(\frac{1}{12})\}-\frac{1}{12}=\frac{7}{12}\Rightarrow x=\frac{7}{12}$

Sol.283.(d) Factorization of 288 then we get -- 2 × 2 × 2 × 2 × 2 × 3 × 3
For making a perfect cube, 288 will be multiply with (2 × 3)
Then 288 × 6 , now we can say that 6 is the smallest natural number.

Sol.284.(b) a(first term)= 2,
t_n(last term) = 84, Common Difference d = 2, No. of terms,t_n = a + (n - 1)d
$\Rightarrow 84 = 2 + (n-1)2$
$\Rightarrow \frac{84-2}{2}$ = n - 1$\Rightarrow n = 41 + 1 = 42$

Now, Sum(S_n) = $\frac{n}{2}\{2a + (n-1)d\}$

= $\frac{42}{2}$ (2 × 2 + 41 × 2) ⇒ 21 × 86=1806

Sol.285.(a) 3.14×10^6
= $\frac{314}{100}\times 1000000$ = 3140000

Sol.286.(a)
Dividend=(Divisor × quotient) +remainder
Let us assume p is the quotient when x is divided by 7 and q is the quotient when y is divided by 7.
X= (7 x p) + 1 and Y= (7 x q) + 2
Therefore, X + Y = 7p + 7q + 1 + 2
= 7(p + q) + 3 ⇒ (X + Y)
when divided by 7 leaves remainder 3.

Sol.287.(a) The greatest four digit number is 9999. After finding Square root by the long division method we get 198 as remainder, So now we subtract 198 from 9999 to get a perfect square number that is 9999 - 198 = 9801

Sol.288.(c) Let the six consecutive numbers are = x, x + 1, x + 2, x + 3, x + 4, x + 5, X + x + 1 + x + 2 = 27
⇒ 3x + 3 = 27, ⇒ 3x = 24, ⇒ x = 8
Sum of next three numbers = 3x + 12
= 3 × 8 + 12 = 36

Sol.289.(b) $\frac{1}{4}+\frac{1}{4\times5}+\frac{1}{4\times5\times6}$
= $\frac{30+6+1}{4\times5\times6}=\frac{37}{120}=0.3083$

Sol.290.(d) 95.75×0.02554 = 2.445445 the decimal point will be after 6 digits from the right

Sol.291.(d) Let the number = x
$\frac{11x}{5}-\frac{5x}{11}=192$
$\Rightarrow\frac{121x-25x}{55}=192\Rightarrow\frac{96x}{55}=192$
$\Rightarrow x=\frac{192\times55}{96}=110$

Sol.292.(a) $5.\overline{46}=\frac{546-5}{99}=\frac{541}{99}$

Sol.293.(b) Total numbers between 500 and 700 = 200
Number divisible by 11 = $\frac{200}{11}$
= $18\ (quotient)$

Sol.294.(b) For the given AP
First term a = 2, Common difference = d = 5 - 2 = 3
Tenth term = a + 9d, = 2 + 9 × 3 = 29

Sol.295.(c) Sum of squares of first ten natural numbers = $\frac{10(10+1)(20+1)}{6}$
= $\frac{10\times11\times21}{6}=385$

Sol.296.(a) In the given sequence
Sum of the Two conjugative number = 0
= { 1 - 1 + 1 - 1 + 1 - 1 +... ... ... 100th term } + 101th term, = 0 + 1, = 1

Sol.297.(b)
First 5 whole number = 0, 1, 2, 3, 4
The product of first five whole numbers = 0

Sol.298.(c) fraction of 1275 is 816
⇒ $\frac{816}{1275}=\frac{16}{25}$

Sol.299.(b) 42 x (4 + 2)= (42 x 4) + (42 x 2) is an example of distributive property .

Sol.300.(b) $5.\overline{6}=\frac{56-5}{90}=\frac{51}{90}$

Sol.301.(b) Square root of 18769 = 137
137 consists of 3 digits.

Sol.302.(c) First multiple of 6 = 6
And 12th multiple of 6 = 72
Sum of 1st 12 multiple of 6
= 6 × (1 + 2 +.....+ 12)
⇒ $\frac{6\times12\times13}{2}$ = 78 × 6 = 468

Sol.303.(d) Descending order
= $\frac{9}{10}, \frac{8}{9}, \frac{7}{8}$

Sol.304.(a) $27\frac{3}{4}=\frac{111}{4}$, Remainder = 3

Sol.305.(d) Let the numbers are x and y
A/Q, x + y = 20 —--------(i)
And $x^2-y^2=80$ —---------(ii)
Put x = 20 - y in equation (ii)
$(20-y)^2-y^2=80$
⇒ 400 + y^2 - 40y - y^2 = 80
$\Rightarrow 40y = 320\Rightarrow y=8$
And x = 20 - 8 = 12

Sol.306.(b) Let , number = 10x + y
x + y = 8 .....(1)
10x + y+ 36 = 10y + x
9(x - y) = -36 ⇒ x - y = -4 .....(2)
From (1) and (2), we get
x = 2, y = 6, Number = 26

Sol.307.(d) Here, x is a even number.
Let , numbers are = x ,(x + 2) , (x + 4) ,(x + 6) ,(x + 8)
A/Q , x + (x + 2) + (x + 4) + (x + 6) + (x + 8) = 660,
5x + 20 = 660 ⇒ x = 128
Therefore , the number will be -- 128 , 130 , 132 , 134 and 136
Greatest number = 136 and smallest number = 128

Sol.308.(c) 115 + x = $\frac{100}{x}$
15x + x^2 = 100 ⇒ x^2+ 15x = 100
Then, we get +ve root (x)= 5

Sol.309.(a) Let, r = 16
then, $\frac{r^2}{16}=\frac{16\times16}{16}$ = 16

Sol.310.(d) The difference between the biggest and the smallest fraction
= $\frac{5}{6}-\frac{2}{3}$, = $\frac{1}{6}$

Sol.311.(d) Sum of 20th term of the series
$\frac{1}{5\times6}+\frac{1}{6\times7}+\frac{1}{7\times8}+...+\frac{1}{24\times25}$
= $\frac{1}{5}-\frac{1}{6}+\frac{1}{6}-\frac{1}{7}+.....+\frac{1}{24}-\frac{1}{25}$
= $\frac{1}{5}-\frac{1}{25}=\frac{5-1}{25}=\frac{4}{25}$ = 0.16

Short Tricks :-
Sum = $\frac{1}{(n-1)d}\left\{\frac{1}{k}-\frac{1}{L}\right\}$
Where , n = no. of terms in denominator
d = difference between the terms
k = first term of first denominator and
L = last term of last denominator .
Required Sum = $\frac{1}{(2-1)1}\left\{\frac{1}{5}-\frac{1}{25}\right\}$
= $\left\{\frac{4}{25}\right\}$ = 0.16

Sol.312.(c) Let , numbers are - X and Y
X + Y = 24 ------(i)
and X - Y =10 ------(ii)
From equation (i) & (ii)
X = 17 , Y = 7
The value of two times the product of the numbers = 2 (17 × 7) = 238

Sol.313.(b) The multiples of 4
= 4 , 8 , 12 , 16 , 20 .....
These are in A.P. , having first term as 4 and common difference as 4
Therefore , a = 4 , d = 4 , s_{12} = ? , n=12

$s_n = \frac{n}{2}\{2a + (n-1)d\}$

$s_{12} = \frac{12}{2}\{8 + (12-1)4\}$

$s_{12} = 6\,(8 + 44)$, $s_{12} = 312$

Sol.314.(a)

$(1+\frac{1}{3})(1+\frac{1}{4})(1+\frac{1}{5})\ldots\ldots\ldots(1+\frac{1}{n-1})$

$= \frac{4}{3}\times\frac{5}{4}\times\frac{6}{5}\ldots\ldots\ldots\cdot\frac{n}{n-1} = \frac{n}{3}$

Sol.315.(c)

All factors of 817 = 1 , 19 , 43 , 817 .

817 is not a prime number because 817 has factors.

Note - A number that can be divided exactly only by itself and 1 are called prime numbers.

Example - 2 , 3 , 5, 7 etc

Sol.316.(c) In 5X1 + 6Y7 + 3Z3 = 1471 , highest value of X will be possible = 6

Sol.317.(a) $\frac{25^{25}}{26} = \frac{(26-1)^{25}}{26}$

Remainder = 25

Sol.318.(d) Largest 4 digit square number will be smaller than 9999

And smallest 4 digit square number will be greater than 1000

So when we divide Largest number by smaller number the quotient will be always less than 10

Sol.319.(a) $124^n + 124^{(n+1)}$

Unit place of $4^{even} = 6$, $4^{odd} = 4$

n and n + 1 , both are consecutive numbers so one will be odd and other will be even

Unit place digit = 4 + 6 = 10 = 0

Sol.320.(d) $64 = 2^6$

Number of factors = 6 + 1 = 7

$729 = 3^6$ Number of factors = 6 + 1 = 7

Sum = 64 + 729 = 793

Sol.321.(d) Let the number of the students = x, Fee = x

According to question,

$x \times x = 2601 \Rightarrow x^2 = 2601 \Rightarrow x = 51$

Sol.322.(a) Let the numbers = a and b

According to question,

a - b = 14, a = b + 14

And $a^2 - b^2 = 56$

$\Rightarrow (b+14)^2 - b^2 = 56$

$\Rightarrow b^2 + 196 + 28b - b^2 = 56$

$\Rightarrow 28b = 56 - 196 = -140$

$\Rightarrow b = -5$, And a = - 5 + 14 = 9

Alternate Method: check by options 9 and -5 will satisfy the conditions given in question.

Sol.323.(c) Let the numbers are = x and y

A/Q, x+ y = 13

y = 13 - x, And $x^2 - y^2 = 39$

$x^2 - (13-x)^2 = 39$

$\Rightarrow x^2 - (169 + x^2 - 26x) = 39$

$\Rightarrow 26x - 169 = 39 \Rightarrow 26x = 208$

$\Rightarrow x = 8$, y = 13 - 8 = 5

Alternate method:

Check by options : (8, 5) will satisfy the question

Sol.324.(b) $4^7 - 4$

$= 4\,(4^6 - 1)$, $= 4(4^3 + 1)(4^3 - 1)$

= 4 x 65 x 63

So $4^7 - 4$ is not divisible by 8.

Sol.325.(d) Let the numbers are x and y

A/Q, $\frac{x}{3} + \frac{y}{2} = 8$

$\Rightarrow 2x + 3y = 48$ ___(1)

And $\frac{x}{5} + \frac{y}{6} = 4$

$\Rightarrow 6x + 5y = 120$ ____(2)

On solving equation (1) and (2), we get

$x = 15\ and\ y = 6$

Sol.326.(c) Sum of first 25 odd numbers

$= n^2 = 25 \times 25 = 625$

Sol.327.(c) A/Q, we have to find

$12^2 + 16^2 + 20^2 + \ldots\ldots\ldots\ldots + 96^2$

Taking $4^2\ common\ to\ all$

$4^2(3^2 + 4^2 + \ldots\ldots\ldots + 24^2)$

Sum of squares of 1 to 24 Sum

$= \frac{24(24+1)(48+1)}{6}$

$= 4 \times 25 \times 49 = 4900$

$\Rightarrow (3^2 + 4^2 + \ldots\ldots\ldots + 24^2)$

$= 4900 - 5 = 4895$

$\Rightarrow 4^2(3^2 + 4^2 + \ldots\ldots\ldots + 24^2)$

$= 16 \times 4895 = 78320$

Sol.328.(c) Let the number of pages in the book = x ,Pages read by boy on 1st day = $\frac{3}{8}x$,

Remaining pages = $x - \frac{3x}{8} = \frac{5x}{8}$

Pages read by boy on 2nd day

$= \frac{5x}{8}\times\frac{4}{5} = \frac{x}{2}$

Total pages read by boy = $\frac{3x}{8} + \frac{x}{2} = \frac{7x}{8}$

A/Q, $x - \frac{7x}{8} = 45 \Rightarrow \frac{x}{8} = 45$

$\Rightarrow x = 360$

Sol.329.(c) $\frac{7}{5} + \frac{5}{9} = \frac{63+25}{45} = \frac{88}{45}$

Reciprocal of $\frac{88}{45}\ is = \frac{45}{88}$

Sol.330.(a) 231 is not a prime number.

Factor of 231 = 1,3 77 ,11 ,22 etc

Sol.331.(c) Let the length of the pillar = x

1st part = $\frac{x}{4}$

2nd part = $\frac{x}{4}\times\frac{4}{8} = \frac{x}{8}$

3rd part =

$x - (\frac{x}{4} + \frac{x}{8}) = x - \frac{3x}{8} = \frac{5x}{8}$

A/Q, $\Rightarrow \frac{5x}{8} = 10 \Rightarrow x = 16\ m$

Sol.332.(d) The odd numbers between 0 and 52 = 1, 3, ……. 51

Total odd numbers = 26

Sum of all odd numbers

$= 26 \times 26 = 676$

Sol.333.(b) Let the number = x

A/Q,

$\frac{(x+7)\times 5}{9} = 12 + 3$

$\Rightarrow 5x + 35 = 135 \Rightarrow 5x = 100$

$\Rightarrow x = 20$

Sol.334.(d) Let the denominator = x

Numerator = x - 2

A/Q, $\frac{x-2-2}{x+2} = \frac{1}{3}$

$\Rightarrow 3x - 12 = x + 2 \Rightarrow 2x = 14$

$\Rightarrow x = 7$

Original fraction = $\frac{7-2}{7} = \frac{5}{7}$

Sol.335.(b) Given ,

4 × 1 + 5Y3 + 2Z7 = 1181

Where,

1

4 X 1

5 Y 3

2 Z 7

11 8 1

X + Y + Z = 8 - 1, for maximum value

X = 7 (when y = 0 , z = 0)

Sol.336.(a)

$(89^{89} + 87^{89})$ and $(89^{97} + 87^{97})$

Common factor = 89 + 87 = 176

Sol.337.(c) LCM of 2 , 3 and 6 = 6

Such term will be in the form of 6k - 1 where k= 1,2,3 and so on third term in the sequence will be = 6 × 3 - 1 = 17

Sol.338.(d) The difference between the place values of 2 and 3 in the number 128935 = 20000 - 30 = 19970

Sol.339.(c)

Let the numbers are = x , x + 1 , x + 2
x + (x + 1) + (x + 2) = 120
3x + 3 = 120 , x = 39
Largest number = x + 2 = 39 + 2 = 41

Sol.340.(d) 571 is a prime no.
Note - A number greater than 1, with exactly two factors, 1 and itself, is defined as a prime number.

Sol.341.(d) Rational number between 9.2 and 10.5 = 9.55

Sol.342.(b) The CP of 10 pencils and 12 pens = Rs 150
CP of 30 pencils and 36 pens
= 150 × 3 = $Rs\ 450$

Sol.343.(d) Let the number = x
According to question,
$x \times \frac{1}{8} \times \frac{1}{4} = 300$
$\Rightarrow x = 32 \times 300 = 9600$
Now, One fifth of $x = \frac{9600}{5} = 1920$

Sol.344.(d) LCM of 8,12 and 16 = 48
48k + 3 must be multiple of 7
For k = 3,
48 × 3 + 3 = 147

Sol.345.(a) Infinitely decimal numbers can be found between 0.225 and 0.227

Sol.346.(b)
Let the prime numbers be a , b and c
According to question,,
ab = 323 ____ (1)
bc= 221 _____(2)
Dividing (1) by (2)
$\frac{a}{c} = \frac{19}{13}$, Greatest number = a = 19

Sol.347.(b) First 6 even numbers
= 2, 4, 6, 8, 10, 12
$2 \times 4 \times 6 \times 8 \times 10 \times 12 = 46,080$

Sol.348.(a) As the number 2893#$ is divisible by 8 and 5, Then the last digit must be $ = 0 ; And the last 3 digits must be divisible by 8 ;
So, in 3#0, # will be equal to = 2 , to make it divisible by 8 ;
i.e. the digits that will come in place of # and $ are 2, 0 respectively.

Sol.349.(d)
Let the smallest whole number = x
$\Rightarrow \frac{3}{5}x > 6 \Rightarrow x > 10$
So, when going through options only 11 is greater than 10
so , smallest whole number = 11

Sol.350.(d) The least number which is added in 1000 such that the number is divisible by 15 is 5.

Sol.351.(c) Sum of 1 to 75 natural numbers = $\frac{75 \times (75+1)}{2} = \frac{75 \times 76}{2}$
= 2850 And sum of 1 to 24 natural numbers = $\frac{24 \times (24+1)}{2}$ = 300
Then ,
25 + 26 +.....+ 75 = 2850 - 300 = 2550

Sol.352.(c)
$\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \ldots\ldots\ldots + \frac{1}{99 \times 100}$
$= \frac{1}{2} + \frac{1}{6} + \frac{1}{12} + \ldots\ldots\ldots + \frac{1}{99 \times 100}$
$= \frac{99}{100} = 0.99$
Short Tricks :-
Sum = $\frac{1}{(n-1)d}\left\{\frac{1}{k} - \frac{1}{L}\right\}$
Where , n = no. of terms in denominator
d = difference between the terms
k = first term of first denominator and
L = last term of last denominator .
Required Sum = $\frac{1}{(2-1)1}\left\{\frac{1}{1} - \frac{1}{100}\right\}$
$= \left\{\frac{99}{100}\right\}$ = 0.99

Sol.353.(c) Let numbers are x , y and z
ratio between x , y and z = 6 : 3 : 2
Then , 6 + 3 + 2 = 11 unit
11 unit = 253 , 1 unit = 23
So , 2nd number = y = 3 unit = 69

Sol.354.(b) Sum of squares of n natural numbers = $\frac{n \times (n+1) \times (2n+1)}{6}$
$21^2 + 22^2 + 23^2 + \ldots\ldots + 30^2$ = (Sum of square of 1 to 30) - (Sum of square of 1 to 20) Sum of square of 1 to 30
= $\frac{30 \times (30+1) \times (2 \times 30+1)}{6}$
= $\frac{930 \times 61}{6}$ = 9455
Sum of square of 1 to 20
= $\frac{20 \times (20+1) \times (2 \times 20+1)}{6}$
= $\frac{17220}{6}$ = 2870
Hence ,$21^2 + 22^2 + 23^2 + \ldots\ldots + 30^2$
= 9455 - 2870 = 6585

Sol.355.(b) Given , x + y = 10 ------(i)
and $x^2 - y^2 = 60$
$x^2 - y^2$= (x - y)(x + y)
60 = (x - y)10,
6 = x - y ------(ii)
Then, From equation (i) and (ii)
$2x = 16 \Rightarrow x = 8$
Now , putting the value of x in equation (i)
x + y = 10 , 8 + y = 10 $\Rightarrow$ y = 2
Hence , Numbers are 8 and 2
Alternate method,
We can go through the options and find solution.

Sol.356.(d) Let , least +ve integer = x
$x^2 = 5x - 6$, $x^2 - 5x + 6 = 0$
X = 3 and 2
Hence , least +ve integer = 2

Sol.357.(d) Any number is divisible by 4 if the last 2 digits of the number are divisible by 4.
If we put 5 in place of $, the last 2- digit will be 54 and not divisible by 4.

Sol.358.(a) $\frac{17^{200}}{18} = \frac{(18-1)^{200}}{18}$
Remainder = $(-1)^{200} = 1$

Sol.359.(c) Smallest prime number = 2 , greatest prime number = 7
Difference between the largest and the smallest single-digit prime numbers
= 7 - 2 = 5

Sol.360.(a) 29^2 = 841
0.000845 - 0.000004 = 0.000841
0.000841 is a perfect square number.
$\sqrt{0.000841}$ = 0.029

Sol.361.(d) $(127)^{153} \times (341)^{89}$
$153 \div 4 = Remainder = 1$
Unit digit = $7^1 \times 1$ = 7

Sol.362.(b) LCM of (4, 5, 6, 7, 8) = 840
The number should be multiple of 13 and remainder =2, it will in the form of
840k + 2, Put k = 3
$840 \times 3 + 2 = 2522$

Sol.363.(b) 3 digits number which is divisible by 7 = 105, 112, 119..., 994
$a_n = a + (n-1)d$
Where , First term = a = 105, Common difference = d = 112 − 105 = 7
⇒ 994 = 105 + (n − 1) (7)
⇒ 994 = 105 + 7n−7 ⇒ 896 = 7n
⇒ n = 128

Sol.364.(d) $6^{61} + 6^{62} + 6^{63} + 6^{64} + 6^{65}$
6^{61} (1 + 6 + 6^2 + 6^3 + 6^4)
6^{61} (1 + 6 + 36 + 216 + 1296)
6^{61} (1555) 6^{60}(9330)
6^{60}(622 × 15) so, it is divisible by 15

Sol.365.(b) Here (72 - 52) = 20, (80 - 60) = 20 and (88 - 68) = 20
required number (LCM of 72 , 80 and 88) - 20 = 7920 - 20, = 7900

Sol.366.(b) Total numbers between 100 and 300 = 200

Now, $\frac{200}{7} = 28\ (quotient)$

28 numbers are divisible by 7.

Sol.367.(c) Let the number = x

According to question,

$\Rightarrow \frac{6x}{5} - \frac{5x}{6} = 572$

$\Rightarrow \frac{36x - 25x}{30} = 572 \Rightarrow \frac{11x}{30} = 572$

$\Rightarrow x = \frac{572 \times 30}{11} = 52 \times 30 = 1560$

Sol.368.(d) Largest number of four digit = 9999 LCM of (5, 35, 39, 65) = 1365

When we divide 9999 by 1365, We get remainder = 444

Now, 9999 - 444 = 9555

Sol.369.(d) $(\sqrt{2} + \frac{1}{\sqrt{8}})^2 = 2 + \frac{1}{8} + 2 \times \sqrt{2} \times \frac{1}{\sqrt{8}} = 2 + \frac{1}{8} + 1$

$= 3 + \frac{1}{8} = \frac{24+1}{8} = \frac{25}{8}$

It is a rational number.

Sol.370.(b) 285 - 9 = 276

1249 - 7 = 1242

HCF of 276 and 1242 = 138

Sol.371.(b) When K is divided by 18 , the remainder is 9.

So, $K = 18 \times 1 + 9 = 27$

When K = 27 is divided by 6, remainder will be = 3

Sol.372.(b) LCM of 6, 8, 12 = 24

Number should be multiple of 7

24k + 1, Put k = 2

$24 \times 2 + 1 = 49$

Sol.373.(d) $588 = 2 \times 2 \times 3 \times 7 \times 7$

Only prime number 3 has no pair so, 3 is the least number multiplied to get a perfect square.

Sol.374.(a) Prime numbers between 8 and 59 = 11,13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53,

Sum = 11 + 13 + 17 + 19 + 23 + 29 + 31 + 37 + 41 + 43 + 47 + 53 = 364

Sol.375.(b) $(2 \times 3)^7 \times (5 \times 7)^3 \times 11^{10}$

Number of 2 = 7 , Number of 3 = 7 , Number of 5 = 3 ,Number of 7 = 3

Number of 11 = 10

So that ,

total number of prime numbers = 30

Sol.376.(c) Let , number = x

According to question,

$\frac{3}{5} + x = \frac{5}{3}$, $x = \frac{5}{3} - \frac{3}{5}$

$x = \frac{25-9}{15}$, $x = \frac{16}{15}$

Sol.377.(a) Single digit prime numbers - 2 , 3 , 5 , 7,

Total numbers = 4

Sol.378.(c) Sum of squares of first ten natural numbers = $\frac{n(n+1)(2n+1)}{6}$

$= \frac{10(10+1)(2 \times 10+1)}{6}$

$= \frac{10 \times 11 \times 21}{6} = 385$

Sol.379.(b)

n = 1 , $1^3 - 1 = 0$

n = 2 , $2^3 - 2 = 6$

n = 3 , $3^3 - 3 = 24$

So , all values are divisible by only 6

Sol.380.(b) The product of two positive numbers is 972 and their quotient is $\frac{4}{3}$

Let the numbers are 4x and 3x ;

Then $12x^2 = 972 \Rightarrow x^2 = 81 \Rightarrow x = 9$

So, the numbers are $4 \times 9 = 36$ and $3 \times 9 = 27$

Sol.381.(c) Rational numbers can be both positive and negative ;

So, the negative of a non-zero rational number is also a rational number.

Sol.382.(b) Largest four digit number is = 9999 Number divisible by 77 means also divisible by 7 & 11 ;

So, the largest four-digit number which is exactly divisible by 77 near to 9999 is :

= 9933 [as it is divisible by both 7 & 11]

Sol.383.(c) LCM of (6, 8, 12,) = 24

$24 \times 3 = 72$

It is not multiple of 14

When we subtract 2 from it now 70 is divisible by 14 . And when we divide it by 6, 8 and 12 leaves remainder 4, 6, 10 respectively.

Sol.384.(a) For a given fraction we can form an infinite number of equivalent fractions by multiplying it by natural numbers.

Sol.385.(d) Case 1. 510 is divided by 24 then we get remainder = 6

Case 2. 270 is divided by 24 then we get remainder = 6

So, subtract 6 from both numbers.

Sol.386.(d) $119^2 - 111^2$

= (119 + 111)(119 - 111)

$=230 \times 8 = 1840$

Sol.387.(a) pq is a two digit number, we can write it as

10p + q, qp = 10q + p

According to question,

(10p + q) - (10q + p)

=10p - p + q -10q = 9p - 9q = 9(p - q)

So pq - qp must be divisible by 9.

Sol.388.(c) Every rational number is a whole number is incorrect.

Sol.389.(b) Let both numbers = x and y

$x + y = 15$

$\frac{1}{x} + \frac{1}{y} = \frac{3}{10} \Rightarrow \frac{x+y}{xy} = \frac{3}{10}$

$\frac{15}{xy} = \frac{3}{10} \Rightarrow xy = 50$

$x = 5$ and $y = 10$

Sol.390.(a) $x^{65} - x = x(x^{64} - 1)$

x^{64} *is an even number because x is even.*

When we subtract 1 from it it would become a odd number So it will be divisible by both 2 and 3

Hence this will be divisible by 6.

Sol.391.(b) All prime numbers greater than 5 and less than 18 are

7, 11, 13 , 17

Sum = 7 + 11 + 13 +17 = 48

One third of 48 = 16

16 is square of 4.

Sol.392.(d)

Sum of cubes of first 4 natural numbers

$= (\frac{4(4+1)}{2})^2 = (10)^2 = 100$

Sol.393.(c) 101^3 = 10,30,301

Sol.394.(d) Prime factorisation of 12288

$12288 = 2^{12} \times 3$

Number of factors

$= (12 + 1) \times (1 + 1) = 13 \times 2 = 26$

Sol.395.(b) $\frac{3}{2}$, $-\frac{3}{2}$, $\frac{11}{4}$, $\frac{5}{2}$

Make the denominator equal

$\frac{-6}{4}$, $\frac{6}{4}$, $\frac{11}{4}$, $\frac{10}{4}$

Now compare on the basis of numerator. If numerator is greater then the fraction will be greater.

Greater number = $\frac{11}{4}$

Sol.396.(c)

Smallest 3 digit prime number = 101

Sol.397.(a) $\frac{5}{7} = 0.71$ and $\frac{3}{4} = 0.75$

$\frac{8}{11} = 0.72$, $\frac{11}{15} = 0.73$

Sol.398.(b) HCF of 28 and 81 = 1

Sol.399.(c) (- 3) × (- 7) = (- 7) × (- 3) is commutative property.

Sol.400.(c) Given sequence -

1 + 2 + 3 +...+ 49 + 50

Sum = $\frac{n\,(n+1)}{2} = \frac{50\,(50\,+1)}{2}$,

= $\frac{50\,\times 51}{2}$ = 25 × 51 = 1275

Sol.401.(b) As we know the largest 4-digit number = 9999 ;
LCM of 7, 9, 11 is = 693 ;
Multiple of the LCM nearest to 9999 is
= 693 × 14 = 9702 ;
Then largest four- digit number which when divided by 7,9 and 11 leaves a remainder of 5 in each case = (9702 + 5) = 9707 ;

Sol.402.(b) Let the divisor = d and the divisor is one-third of the quotient q
i.e. q = 3d ;
Given that dividend is 2200,
remainder is 13

$\Rightarrow d \times q + 13 = 2200$

$\Rightarrow 3d^2 + 13 = 2200$

$\Rightarrow d^2 = 729 \Rightarrow d = 27$

Sol.403.(c) As we know :

$14^3 < 2750 < 15^3$

So, the least positive integer that should be subtracted from 2750, so that the difference is a perfect cube =
(2750 - 2744) = 6 ;

Sol.404.(c) LCM of 5, 12, 18 is = 180 ;
the smallest 4 digit number divisible by 180 is = 1080 ;
the largest 4 digit number divisible by 180 is = 9900 ;
These multiples of 180 forms an Arithmetic Progression having first term = 1080, last term = 9900 and common difference = 180 ;
Then number of such terms = n

= $\frac{9900-1080}{180} + 1 = 50$;

So, there are 50 four digit numbers which are completely divisible by 5, 12, 18 ;

Sol.405.(c) To find the ascending order of the given numbers : $\frac{2}{3}, \frac{1}{2}\ and\ \frac{1}{6}$
we have to equalize the denominators.
⇒, $\frac{4}{6}, \frac{3}{6}, and\ \frac{1}{6}$
Then the Ascending order will be :
$\frac{1}{6}\ \frac{3}{6}, \frac{4}{6}$ i.e, $\frac{1}{6}, \frac{1}{2}, \frac{2}{3}$

Sol.406.(a) Let the two numbers are a and b ; i.e. a - b = 45 .....(1)
When 20% of the larger number is added to 35% of the smaller number, we get a sum of 31.

⇒ $\frac{a}{5} + \frac{7b}{20} = 31 \Rightarrow 4a + 7b = 620$ ..(2)

Solving these two equations we get :
a = 85 and b = 40 ;
Then the sum of the original numbers
= 125

Sol.407.(b) The number that has factors other than 1 and itself is called a composite number.

Sol.408.(b) If the numerator of a fraction is strictly less than the denominator, then the fraction is a Proper fraction , e.g. $\frac{3}{7}$

Sol.409.(d)
We can write 11^{41} + 3 as = $(10 + 1)^{41}$ + 3 ;
when 11^{41} + 3 is divided by 10, Then the remainder = $(+1)^{41}$ + 3 = 4 ;

Sol.410.(b) As we know :
Two prime numbers are called twin primes if there is present only one composite number between them, we can also say two prime numbers whose difference is two are called twin primes.
Then the number of pairs of twin primes between 1 and 100 are = 8 ;
(3, 5), (5, 7), (11, 13), (17, 19), (29, 31), (41, 43), (59, 61), (71, 73) ;

Sol.411.(a) $\frac{3}{4}$ = $0.75\ and\ \frac{6}{7} = 0.8571$

Then the fraction $\frac{9}{11}$ = 0.8181 ;

So, $\frac{9}{11}$ lies between $\frac{3}{4}\ and\ ;\frac{6}{7}$

Sol.412.(c)

Let the lowest whole number = x

A/Q, $\frac{12-x}{17-x} = \frac{11}{20}$

$\Rightarrow 240 - 20x = 187 - 11x$

$\Rightarrow 9x = 53 \Rightarrow x = 5.88$

In whole number x should be at least 6.

Sol.413.(d) 4200 = $2^3 \times 3 \times 5^2 \times 7$
Number of factors =
(3 + 1)(1 + 1)(2 + 1)(1 + 1)
= $4 \times 2 \times 3 \times 2 = 48$

Sol.414.(d) $\frac{3467860}{19}$, Remainder = 18
So, the number = 3467860 - 18
= 3467842

Sol.415.(d)
Ratio of the two numbers = 3: 5
A/Q , 8 units =80, 5 units = 50
3 units= 30
So , greatest number = 50

Sol.416.(d) Total numbers divisible by 6 between 1 and 520 = $\frac{520}{6}$

= $86\ (only\ integer\ part)$
Multiple of 6 less than 17 = 2
Total multiples of 6 between 17 and 520 = 86 - 2 = 84
Multiples of 6 are
18, 24 , ... 516
Sum = $\frac{1st\ term + last\ term}{2} \times 84$

= $\frac{18+516}{2} \times 84 = 534 \times 42 = 22428$

Sol.417.(c)
Dividend = Divisor ×Quotient +Remainder

$\Rightarrow 12401 = D \times 76 + 13$

$\Rightarrow 12401 - 13 = 76 \times D$

⇒ 12,388 = 76 × $D \Rightarrow D = \frac{12388}{76}$ = 163

Sol.418.(a) Rational numbers are

= $\frac{-7}{10}, \frac{-5}{8}, \frac{-2}{3}$

Make denominator equal
LCM of (10, 8, 3) = 120

$\frac{-7\times 12}{10\times 12} = \frac{-84}{120} = \frac{-5\times 15}{8\times 15}$

$= \frac{-75}{120}, \frac{-2\times 40}{3\times 40} = \frac{-80}{120}$

New Rational numbers obtained are

= $\frac{-84}{120}, \frac{-75}{120}, \frac{-80}{120}$

Now compare with numerator

$\frac{-84}{120}, \frac{-80}{120}, \frac{-75}{120} = -, \frac{7}{10}, \frac{2}{-3}, \frac{5}{-8}$

Sol.419.(d) Decimal number has two parts : the whole part and the decimal part.
Decimal part of the decimal number is always less than 1.

Sol.420.(d) $\frac{7^2\times 9^2}{8} = \frac{49\times 81}{8} = 1 \times 1$
So, after dividing this, we get the remainder as 1.

Sol.421.(c)
Check each option one by one.
We get that -1 = $(-1)^3$
$\Rightarrow -1 = -1$

Sol.422.(d) Let the ten's place digit of the number = $x$and unit digit = 3
A/Q, $x + 3 = \frac{1}{7}(10x + 3)$
$\Rightarrow 7x + 21 = 10x + 3$
$\Rightarrow 3x = 18 \Rightarrow x = 6$
So, the required number = 63

Sol.423.(a)
Option (a) 240 = 1 × 2 × 2 × 2 × 2 × 3 × 5

Divisor of 240 = 1 , 2 , 4 , 8 , 16 , 48 , 240 , 3 , 6 , 12 , 24 , 5 , 10 , 20 , 40 and 80
No. of divisors of 240 is **16.**
Option (b) 156 = 1 × 2 × 2 × 3 × 13
Divisor of 156 = 1 , 2 , 4 , 12 , 156 , 3 , 6 , 12 , 13 , 26 and 52
No. of divisors of 156 is 11.
Option (c) 200 = 1 × 2 × 2 × 2 × 5 × 5
Divisor of 200 = 1 , 2 , 4 , 8 , 40 , 200 , 5 , 10 , 20 , 40 , 25 , 50 and 100
No. of divisors of 200 is 13.
Option (d) 172 = 1 × 2 × 2 × 43
Divisor of 172 = 1 , 2 , 4 , 172 , 43 and 86
No. of divisors of 172 is 6.
Clearly , 240 has maximum no. of divisors.

Sol.424.(c)

Arithmetic mean $(AM) = \frac{a+b}{2}$

Geometric mean $(GM) = \sqrt{ab}$

$\frac{a+b}{2} = 7 \Rightarrow a + b = 14 \ldots\ldots (1)$

$\sqrt{ab} = 2\sqrt{10} \Rightarrow ab = 40 \ldots\ldots (2)$

By solving eq .(1) and (2) we get,
a = 4 and b = 10

Sol.425.(c) Let number be x
According to the question,
X = 234q + 36 (where q is quotient)
x = 13(18q + 2) + 10
So the remainder will be 10.

Sol.426.(b) Let the number be → x
Then, 8x + 4 = 100 → x = 12

Sol.427.(a) The sum of 'n' even natural numbers = n (n + 1)
The sum of '12' even natural numbers
→ 12 × 13 = 156

Sol.428.(d) According to the question
$3 \times N^2 - 4N = 50 + N$
$3N^2 - 5N = 50 \Rightarrow 3N^2 - 5N - 50 = 0$
$3N^2 - 15N + 10N - 50 = 0$
$(3N + 10)(N - 5) = 0 \Rightarrow N = 5$

Sol.429.(a) Let , the largest number is **a** and the smallest number is **b**
According to question ,
a = 15b , and product of these number
$\rightarrow (a \times b) = 9375 \Rightarrow (15b \times b) = 9375$
$b^2 = \frac{9375}{15} \Rightarrow b^2 = 625 \Rightarrow b = 25$
Now, a = 15b ⇒ a = 15 × 25 = 375
Required sum = 375 + 25 = 400

Sol.430.(a)
Let, unit digit of a two digit number is 4x and the digit in ten's place is x
According to question,
$(x + 4x) = 10 \Rightarrow 5x = 10 \Rightarrow x = 2$
So, unit digit is 4x = $(4 \times 2) = 8$ and digit in ten's place is 2, Therefore number = 28

Sol.431.(d) 1st no. $(N_1) = (15a + 12)$
and 2nd no.$(N_2) = (5a + 2)$
A.T.Q, $\frac{N_1 + N_2}{5} = \frac{(15a+12)+(5a+2)}{5}$
$\rightarrow \frac{20a+14}{5}$ = Rem. 4

Sol.432.(d)
We know that n sum of square of n natural numbers is
$\Rightarrow \frac{1}{6} n(n+1)(2n+1)$
$\Rightarrow \frac{1}{6} \times 10 \times 11 \times 21 = 385$

Sol.433.(d) If a and b are coprime then a^2 and b^2 are also Co-prime number

Sol.434.(a) Largest 4-digit no. be 9999.
$\frac{9999}{88}$ = 88 × 113 + 55 ⇒ rem.(55)
Required no. = 9999 − 55 = 9944

Sol.435.(d) ($2^{25} + 2^{26} + 2^{27} + 2^{28}$)
$\Rightarrow 2^{25}(1 + 2^1 + 2^2 + 2^3)$
$\Rightarrow 2^{25}(1 + 2 + 4 + 8) \Rightarrow 2^{25}(15)$
Therefore, ($2^{25} + 2^{26} + 2^{27} + 2^{28}$) is the multiple of 15.

Sol.436.(d) Let the original fraction be $\frac{a}{b}$
According to the question ,
$\frac{a + 100\%of\ a}{b + 150\%of\ b} = \frac{16}{25} \Rightarrow \frac{a+a}{b+\frac{3}{2}b} = \frac{16}{25}$
$\Rightarrow \frac{4a}{5b} = \frac{16}{25} \Rightarrow \frac{a}{b} = \frac{4}{5}$

Sol.437.(a) Prime no. between 50 and 100 = 53 , 59 , 61 , 67 , 71 , 73 , 79 , 83 , 89 ,97.
Not any pairs of prime numbers are there that add up to a prime number.

Sol.438.(d) Let the four consecutive numbers be x, x + 1, x + 2 and x + 3
⇒their product = x (x + 1) (x + 2) (x + 3)
Let x = 1 ⇒ 1(2) (3) (4) = 24

Sol.439.(c) Divisibility rule of 11 :- if the difference between the sums of the alternate digits of the given number is either 0 or divisible by 11, then the number is divisible by 11.
Let choose option (c)
⇒ (3 + 5 + 8) - (2 + 1 + 2) = 11
Clearly , option (c) 325182 is divisible by 11 .

Sol.440.(d) Let the number be x.
According to question ,
$(x - 4) = \frac{1}{x} \times 21 \Rightarrow x^2 - 4x - 21 = 0$
$x^2 - 7x + 3x - 21 = 0$
$\Rightarrow x(x - 7) + 3(x - 7) = 0$
$\Rightarrow (x - 7)(x + 3) = 0 \Rightarrow x = 7 , x = -3$
The number is 7.

Sol.441.(d) If the number ends with 2 and 8 , there square always ends with 4 and The cube of that number always ends with 2 or 8 .

Sol.442.(a) Let three consecutive odd integers be (x - 2), (x),(x + 2)
according to the question
⇒ 3 × (x - 2) = 2 ×(x + 2) + 3 ⇒ x = 13 ,
So the third integer
(x + 2) → (13 + 2) = 1 5.

Sol.443.(b) Numbers having unit digit 1 and 9 , their square will always end with unit digit 1 , but the unit digit of their cube is either 1 or 9 **.**

Sol.444.(b)
Total person in picnic group = 9 unit ,
total adult in that group = 2 unit
Then , total children = 7 unit ,
Difference b/w children and adult (7− 2) units → 5 units = 95
Total children (7 units) = 19 × 7 = 133

Sol.445.(d) According to question,
Let the number is$(10x + y)$, Then
$(10x + y)$ + 18 = $(10y + x)$
9x - 9y = -18 ⇒ x - y = -2 ..... eq .(1)
$(x \times y) = 8$ .....(given)
$(x + y)^2 - (x - y)^2$ = 4xy
$\Rightarrow (x + y)^2 - (-2)^2 = 4 \times 8$
$(x + y)^2 = 36 \Rightarrow (x + y) = \sqrt{36}$
$\Rightarrow (x + y) = 6$ ..... eq .(2)
From eq .(1) and eq .(2) we get ,
x = 2 , y = 4 so number is 24

Sol.446.(a) First seven prime number are 2, 3, 5, 7, 11, 13, 17
Range ⇒ Larger number−smaller number
Range⇒ 17− 2 = 15

Sol.447.(b) No. of perfect squares between 100 and 200 are 4 .
These are 121,144,169,196 .

Sol.448.(d) Let two numbers be x and y
x + y = 13 and $x^2 + y^2 = 97$
Using formula ,
$(x + y)^2 = x^2 + y^2 + 2xy \Rightarrow (13)^2 = 97 + 2xy$
2xy = 169 - 97 ⇒ xy = 36

Sol.449.(b) Let three consecutive odd number be (x - 2) , x, (x + 2)
According to given question
(x + 2) + x + (x - 2) = 20 + (x - 2)
⇒ 2x =18 ⇒ x= 9
So, the largest number be (x + 2)
⇒ 9 + 2 = 11.

Sol.450.(b) According to question ,
$95 - x = 55 + x \Rightarrow 2x = 40 \Rightarrow x = 20$

Required no. → $55 + x = 75$

Sol.451.(b) Let the three consecutive natural numbers are n, (n + 1) and (n + 2)
Product of the numbers = n (n + 1) (n + 2)
It is always divisible by 6.

Sol.452.(c) $\sqrt{3}, \sqrt{12}, \sqrt{27}, \sqrt{48}, \ldots, 22\sqrt{3}$
Common difference = $\sqrt{12} - \sqrt{3}$
= $2\sqrt{3} - \sqrt{3} = \sqrt{3}$
Number of terms
= $\frac{last\ term - first\ term}{common\ diff.} + 1$
= $\frac{22\sqrt{3} - \sqrt{3}}{\sqrt{3}} + 1 = \frac{21\sqrt{3}}{\sqrt{3}} + 1 = 22$
So, total number of terms = 22 term

Sol.453.(d)
Irrational number : An irrational number is a type of real number which cannot be expressed as a simple fraction.
Now check each option one by one.
(a) $\sqrt{3} \times \sqrt{27} = \sqrt{81} = 9$
(b) $4\sqrt{4} = 4 \times 2 = 8$
(c) $\sqrt{169} - \sqrt{196} = 13 - 14 = -1$
(d) $\sqrt{9} + \sqrt{7} = 3 + \sqrt{7}$,
it is not a simple fraction, so this is an irrational number.

Sol.454.(d) $\frac{7}{6}, \frac{4}{3}, \frac{3}{2}, \frac{5}{3}, \frac{11}{6}$
Common Difference
$\Rightarrow \frac{4}{3} - \frac{7}{6} = \frac{3}{2} - \frac{4}{3} \Rightarrow \frac{1}{6} = \frac{1}{6}$
So, the given fractions are in A.P

Sol.455 .(c) a , b and c are in A.P
Common difference = IInd term - Ist term
Then,
$b - a = c - b \Rightarrow a + c = 2b$

Sol.456.(a) Divisibility rule of 9:- A number is divisible by 9 only if the sum of its digits is also divisible by 9.
Given no. is 5224 ⇒ sum of its digit
= 5 + 2 + 2 + 4 = 13
Clearly , 4 is remainder

Sol.457.(b)
Average of arithmetic progression (A.P.)
= $\frac{first\ term + last\ term}{2} = \frac{33 + 45}{2}$ = 39

Sol.458.(d)
Average of arithmetic progression (A.P.)
= $\frac{first\ term + last\ term}{2} = \frac{45 + 57}{2}$ = 51

Sol.459. (a) for no. of trailing zeroes
$\left[\frac{n}{5^1} + \frac{n}{5^2} + \frac{n}{5^3} \ldots..\right]$
$76! = \left[\frac{76}{5} + \frac{76}{25}\right]$ = 15 + 3 = 18

Sol.460.(c) A number when divided by 42 leaves the remainder 13.
Then no. be 42k + 13
Remainder when 42k + 13 divided by 14
= $\frac{42k + 13}{14} = \frac{14 \times 3 \times k + 13}{14}$
As we know that product of 14 is always divided by 14
So, Remainder = 13

Sol.461.(d) To find the no. of ways to distribute equally among children, we find the total no. of factors .
$480 = 2^5 \times 3^1 \times 5^1$
Total required no. of ways
= 6 × 2 × 2 = 24 ways

Sol.462.(d) Formula to find the triangular no. (T.N.)→ $\frac{1}{2}n(n + 1)$
Put value of n = 1 , we get (T.N.) as 1
n = 2 , we get (T.N.) as 3
n = 3 , we get (T.N.) as 6
n = 4 , we get (T.N.) as 10
n = 5 , we get (T.N.) as 15
Clearly , 5 can't be a triangular number .

Sol.463.(b) As we know, perfect square no ends with (1, 4, 5, 6, 9).
Now, from the given option , we can clearly see that 2048 has irrational square roots.

Sol.464.(c) On checking the given options one by one, we get option (c) satisfies the given condition.
24 = 3(2 × 4), 24 = 24,
LHS = RHS

Sol.465.(b) The given no's are :
$\sqrt[3]{64} = 4, \sqrt{8} = 2\sqrt{2}, \sqrt[3]{8} = 2, \sqrt{64} = 8$
So, we can clearly see that $\sqrt{8}$ is irrational no.

Sol.466.(a) A composite number is a positive integer which is not a prime number (i.e., which has not
Factors other than 1 and itself
(b) Prime factor of 161 = 23 × 7
(c) Prime factor of 203 = 7 × 29
(d) Prime factor of 209 = 11 × 19
109 is a prime number

Sol.467.(b)
The square root of the given no's are :
$\sqrt{3969} = 63, \sqrt{6560} = 4\sqrt{410}, \sqrt{5625}$
= 75 ,$\sqrt{1764} = 42$
So, the square root of 6560 is irrational.

Sol.468.(b) checking by option
By option (a) P = 3 than N = p +1 = 4
4 → (1 + 3) ,(2 + 2)
By option (b) P = 11 than N = P +1 = 12
12 → (1 + 11) ,(2 +10) ,(8 + 6) ,(6 + 6)
We can see) (8 + 6) ,(6 + 6) are two composite numbers
Hence option (b) is the right answer.

Sol.469.(b) Required prime number series from 1 to 20 = (2, 3, 5, 7, 11, 13, 17, 19)

Sol.470.(a) On checking the given options one by one. we get :
$\frac{21}{90} = 0.2\overline{3}, \frac{21}{60} = 0.35$,
$\frac{21}{30} = 0.7, \frac{21}{120} = 0.175$
Clearly, we can see that $\frac{21}{90}$ will yield a recurring decimal.

Sol.471.(d)
Prime factorisation of 256 = $(2^2)^4$
Total no of factors of 256 which are perfect squares = 4 + 1 = 5

Sol.472.(b) For x3451 to be divisible by 3, the sum of its digits i.e.x + 3 + 4 + 5 + 1
= 13+x, should be divisible by 3.
For this , the value of x can be 2,5,8.
So, the required sum = 2 + 5 + 8 = 15

Sol.473.(d) For x4562 to be divisible by 9, the sum of its digits i.e.x + 4 + 5 + 6 + 2
= 17 + x, should be divisible by 9.
For this, the value of x is 1 .So,

Sol.474.(c) Concept used : A prime no is said to be twin primes if it is either 2 less or 2 more than another prime number
On checking all the options one by one, we get In (131,133) ; 133 is not a prime number as it is divisible by 7. Hence, it is not a twin prime number .

Sol.475.(b) LCM of (5,6,7,8) = 840
840 is completely divisible by 5,6,7 and 8
Therefore, number which gives the remainder of 4 = 840 + 4 = 844

Sol.476.(c) Concept used : For a no to be divisible by 12, it has to be divisible by 4 and 3 both.
Now, on checking all the options one by one, we have following results :
(a) 28544, divisible by 4 but not divisible by 3
(b)14632, divisible by 4 but not divisible by 3
(c) 57816, divisible by 4 and 3 both.
(d) 43688, divisible by 4 but not divisible by 3

Sol.477.(d) Since 69 is split into 3 parts such that they form an AP
Let three no's be a-d, a, a+d
According to question,
a + (a - d) + (a + d) = 69
3a = 69 ⇒ a = 23
Also, a(a-d) = 483
23(23 - d) = 483 ⇒ 529 - 23d = 483

23d = 529 - 483 = 46 $\Rightarrow$ d = $\frac{46}{23}$ = 2

So, the numbers are 23 - 2 = 21,
23 and 23 + 2 = 25

Sol.478.(d) The given no's are :

$\sqrt{64}$ = 8, $\sqrt[3]{64}$ = 4, $\sqrt[6]{64}$ = 2 ,

$\sqrt[4]{64} = (8)^{2\times\frac{1}{4}} \Rightarrow \sqrt{8}$

clearly, we can see that $\sqrt[4]{64}$ is an irrational no.

Sol.479.(a)

The square roots of following no's are :

$\sqrt{1825}$ = $5\sqrt{73}$, $\sqrt{625}$ = 25, $\sqrt{3025}$ = 55, $\sqrt{1225}$ = 35 Clearly, we can see that 1825 has an irrational square root.

Sol.480.(d)

Prime factorization of 1568 = $2^4 \times 2 \times 7^2$

So, the least number that should divide 1568 to get a resultant as a perfect square no is 2.

Sol.481.(a)

The square roots of following no's are :

$\sqrt{7840}$ = $28\sqrt{10}$, $\sqrt{2916}$ = 54

$\sqrt{4489}$ = 67 , $\sqrt{1024}$ = 32

Clearly, we can see that 7840 has an irrational square root.

Sol.482.(c) Concept used : sum of first n terms is given by ; $\frac{n}{2}[2a + (n-1)d]$

Here, $\frac{13}{2}$ - 6 = 7 - $\frac{13}{2}$= $\frac{1}{2}$. so, the given series are in AP.

So, the sum of the first 16 terms

= $[2 \times 6 + (16-1)\frac{1}{2}]$

= $8[12 + 7.5] = 8 \times 19.5 = 156$

Sol.483.(b) Let the 3-digit no be XYZ

Then, X = 4Z and Y = 3Z, ATQ,

X + Y + Z = 8, 4Z + 3Z + Z = 8,

8Z = 8, Z = $\frac{8}{8}$ = 1

Now , X = 4 × 1 = 4 and Y = 3 × 1 = 3.

So, a 3-digit no formed is 431

The tens digit in 431 = 3

Sol.484.(b) Let the numerator be x, then denominator = x + 10

Required rational number = $\frac{x}{x+10}$

According to question,

$\frac{x+4}{x+10-3} = \frac{5}{6}$

$\Rightarrow 6x + 24 = 5x + 35$

$\Rightarrow 6x - 5x = 35 - 24 \Rightarrow x = 11$

Hence, the original rational number

= $\frac{11}{11+10}$ = $\frac{11}{21}$

Sol.485.(d) Given, first term = -50 ,
common diff. + 3 , n = 20

20th term = a + (n - 1)d = -50 + (20 - 1)3
= - 50 + 57 = 7

Sol.486.(a)

By solving each option one by one,

(a) $\sqrt[5]{32} = 2^{\frac{5}{5}} = 2$ (b) $\sqrt[6]{32} = 2^{\frac{5}{6}}$

(c) $\sqrt[3]{32} = 2^{\frac{5}{3}}$ (d) $\sqrt[4]{32} = 2^{\frac{5}{4}}$

It is clear that option a is a rational number.

Sol.487.(c) Three digit whole number between 75 and 405

= 100,101,102,.....404.

Number of terms

= $\frac{last\ term - first\ term}{common\ diff.} + 1$

= $\frac{404-100}{1} + 1 = 304 + 1 = 305$

There are 305 three digit whole numbers between 75 and 405.

Sol.488.(c) Place value of 3 in 273965 = 3000 Face value of 3 in 273965 = 3

Now, required difference

= 3000 - 3 = 2997

HCF and LCM

LCM (Least common multiple) of two or more given numbers is the least number that is exactly divisible by each of them.

HCF (Highest common factor) of two or more numbers is the greatest number that divides each of them exactly. HCF is also known as the 'Highest common Divisor' (HCD) and the Greatest Common Measure (GCM).

The concept of multiples and factors

→ If X , Y , and Z are three natural numbers and X × Y = Z , then
(i). X and Y are called the factors of Z.
(ii). Z is said to be divisible by X and Y.
(iii). Z is said to be a multiple of X and Y.
Example: The set of positive Integers which are factors of 18 is (1, 2, 3, 6, 9, 18).

Basic Concepts of H.C.F. and LCM

Method of finding H.C.F.

To find the HCF of the given numbers

1. Break the given numbers into their prime factors.
2. The HCF will be the product of all the prime factors common to all the numbers.

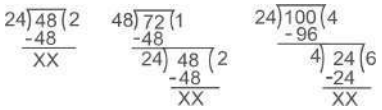
Let us learn the process of finding HCF with the help of some solved examples.

Question:- Find the HCF of 96, 36 and 18.
Solution:-
96 = **2** × **3** × 2 × 2 × 2 × 2
36 = **2** × **3** × 2 × 3
18 = **2** × **3** × 3
Therefore, the HCF of 96, 36 and 18 is the product of the highest number of common factors in the given numbers i.e., 2 × 3 = 6. In other words, 6 is the largest possible integer, which can divide 96, 36 and 18 without leaving any remainder.

Question:-:- Find the H.C.F. of 42 and 70.
Solution:- 42 = 3 × **2 × 7**
70 = 5 × **2 × 7**
Hence, H.C.F. of 42 and 70 = 2 × 7
= 14.

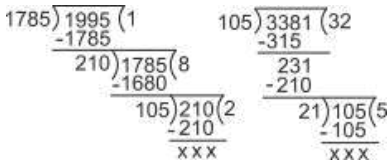
HCF by Division Method

Question:- HCF of 24, 48, 72, and 100.
Solution:- To start the division method select the smallest two numbers./



HCF of 24 and 48 = 24
HCF of 24, 48 and 72 = 24
HCF of 24, 48, 72, and 100 = 4.

Question:- HCF of 1785, 1995, 3381.
Solution:-



HCF of 1785 and 1995 = 105
HCF of 1785, 1995 and 3381 = 21
NOTE :-
(i). HCF of two prime numbers is always 1.
(ii). HCF of co-prime numbers is always 1.

Method of finding L.C.M

The Least Common Multiple of two or more numbers is the smallest number which is exactly divisible by all of them. In other words, it is the product of the highest powers of all the prime factors of the given numbers.

To find the LCM of given numbers:

1. Break the given numbers into their prime factors.
2. The LCM will be the product of the highest power of all the factors that occur in the given numbers.

Let us take some solved examples.

Question: Find the LCM of 96, 36 and 18.
Solution: 96 = 2 × 2 × 2 × 2 × 2 × 3
= $2^5 \times 3^1$; 36 = 2 × 2 × 3 × 3 = $2^2 \times 3^2$
18 = 2 × 3 × 3 = $2^1 \times 3^2$

Therefore, LCM of 96, 36 and 18 is the product of the highest powers of all the prime factors, i.e. $2^5 \times 3^2$ = 32 × 9 = 288. That is, 288 is the smallest integer which is divisible by 96, 36 and 18 without leaving any remainder.

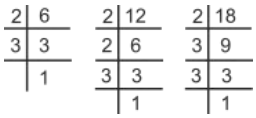
Question:- Find the LCM of 42 and 70
Solution:- 42 = 3 × 2 × 7
70 = 5 × 2 × 7
Hence, LCM is 2 × 3 × 5 × 7 = 210.

Question :- LCM of 6, 12, 8 ?
Solution:-

2	6, 12, 8
2	3, 6, 4
3	3, 3, 2
2	1, 1, 2
	1, 1, 1

LCM = 2 × 2 × 3 × 2 = 24
HCF of 6, 12, 18

Firstly find out the factors of 6, 12, 18 and then multiply the common factors.



6 = 2 × 3, 12 = 2 × 2 × 3, 18 = 2 × 3 × 3
HCF = 2 × 3 = 6
Try finding HCF and LCM of 3, 6, 9, 12 yourself. 3, 6, 9, 12 HCF can also be found by Division method. It is useful when the numbers are bigger.
NOTE :-
(i). HCF of A, B and C is the highest divisor which can exactly divide A, B, and C.
(ii). LCM of A, B and C is the lowest dividend which is exactly divisible by A, B, and C.
There is one very important relationship, given below, between two numbers and their HCF and LCM. Many questions have been asked in various competitive exams based on this relationship.

Important Concepts:-
(1).
LCM × HCF = 1st number × 2nd number
Example:- For numbers 8 and 12,
LCM = 24 and HCF = 4
Now, LCM × HCF = 24 × 4 = 96
also, 8 × 12 = 96

(2). HCF of some numbers is always a factor of LCM of the numbers.

(3).
LCM of Fraction = $\frac{LCM\ of\ numerator}{HCF\ of\ denominator}$

(4).
HCF of Fraction = $\frac{HCF\ of\ numerator}{LCM\ of\ denominator}$

Example: LCM and HCF of $\frac{1}{2}, \frac{2}{3}$ and $\frac{3}{4}$

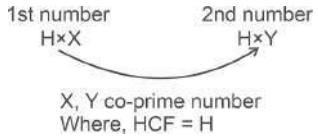
Sol:- LCM = $\frac{LCM\ of\ numerator}{HCF\ of\ denominator}$
= $\frac{LCM\ of\ 1,2,\ 3}{HCF\ of\ 2,3,4} = \frac{6}{1}$
HCF = $\frac{HCF\ of\ numerator}{LCM\ of\ denominator}$
= $\frac{HCF\ of\ 1,2,\ 3}{LCM\ of\ 2,3,4} = \frac{1}{12}$

(5). Co- Prime numbers :
If the HCF of two numbers is 1 then they are called co-prime numbers.

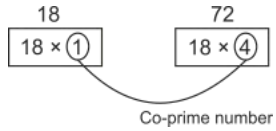
(6). $\frac{LCM}{HCF} = Product\ of\ co-prime\ no.$; where LCM and HCF are of two numbers $N_1\ and\ N_2$. If we find two co-prime

factors, F_1 *and* F_2, of the Product as obtained above then:

(7).



Example:-



(8).

If 1st number = N_1 and 2nd number = N_2

HCF of N_1 = Hx

HCF of N_2 = Hy

And HCF of N_1 and N_2 = H

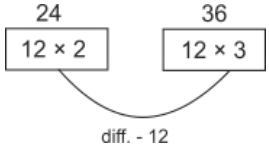
So ,

Difference between N_1 and N_2 = Hx - Hy

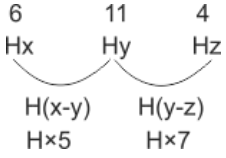
= H(x - y)

Example :-

N_1 = 24 and N_2 = 36



Note :- HCF is always either the difference of two numbers or factors of difference of two numbers.



(9). When the second divisor is a factor of the first divisor, then the second remainder is obtained by dividing the first remainder by the second divisor.

Example :- When 29 is divided by 8, the remainder obtained is 5, then what will be the remainder when the same number is divided by 4 ?

Sol:- Here, the second divisor that is 4 , is a factor of the first divisor that is 8. So, on dividing the first remainder that is 5 by the second divisor that is 4, we get our second remainder which is 1. So, the required answer is 1.

Variety Questions

Q.1. The greatest possible length which can be used to measure exactly the lengths 5 m 25 cm, 7 m 35 cm and 4 m 90 cm is:
Group D 17/08/2022 (Morning)
(a) 25 cm (b) 55 cm (c) 35 cm (d) 45 cm

Q.2. If the sum of two numbers is 430 and their HCF is 43, then which of the following is the correct pair?
Group D 17/08/2022 (Morning)
(a) 172, 258 (b) 129, 301
(c) 86, 344 (d) 215, 215

Q.3. The LCM of 48, 72 and another number, x, is 576. Which of the values given below can be the value of x?
Group D 17/08/2022 (Afternoon)
(a) 288 (b) 192 (c) 144 (d) 96

Q.4. The HCF of any set of 10 co-prime numbers is always
Group D 18/08/2022 (Morning)
(a) 1 (b) 10 (c) 0 (d) 2

Q.5. Which of the following is the greatest number that divides 72 and 119 and leaves 3 and 4 as respective remainders?
Group D 18/08/2022 (Afternoon)
(a) 21 (b) 23 (c) 17 (d) 19

Q.6. There are three numbers which are co-prime to one another such that the product of the first two is 357 and that of the last two is 609. What is the sum of the three numbers?
Group D 23/08/2022 (Morning)
(a) 91 (b) 67 (c) 83 (d) 75

Q.7. Find the greatest number which will divide 8954, 9806 and 11297 leaving the same remainder in each case.
Group D 23/08/2022 (Evening)
(a) 213 (b) 230 (c) 125 (d) 222

Q.8. The LCM of two numbers is 84. If the numbers are in the ratio 2: 3, then find the sum of the numbers.
Group D 24/08/2022 (Morning)
(a) 40 (b) 70 (c) 25 (d) 60

Q.9. Find the greatest 5-digit number that can be divisible by 18, 15 and 21.
Group D 24/08/2022 (Morning)
(a) 99455 (b) 99545
(c) 99450 (d) 99540

Q.10. Find the least common multiple (LCM) of $2^3 \times 3^2 \times 5$, $2^2 \times 5^2 \times 7$ and $3^3 \times 5^2 \times 7^2$
Group D 24/08/2022 (Afternoon)
(a) $2^3 \times 3^3 \times 5^2 \times 7^2$
(b) $2^3 \times 3^2 \times 5 \times 7^3$
(c) $2^3 \times 3^2 \times 5^3 \times 7^2$
(d) $2^3 \times 3^4 \times 5^2 \times 7$

Q.11. The traffic lights at three different crossings turn red after every 30 sec, 45 sec and 60 sec respectively. If they all turn red together at 8.30 am, at what time will they turn red together again?
Group D 24/08/2022 (Afternoon)
(a) 8.33 a.m. (b) 8.38 a.m.
(c) 8.35 a.m (d) 8.34 a.m

Q.12. The least number which, when diminished by 7, is divisible by 12, 16, 18 and 21 is:
Group D 25/08/2022 (Evening)
(a) 1150 (b) 1051 (c) 1015 (d) 1105

Q.13. If the lowest common multiple (LCM) of 27 and n is 54, and the highest common factor (HCF) is 9, then find the value of n.
Group D 26/08/2022 (Afternoon)
(a) 54 (b) 18 (c) 24 (d) 36

Q.14. The LCM and HCF of two numbers are in the ratio 3 : 1, and the product of those numbers is 432. Find the value of least common multiple (LCM) and highest common factor (HCF) respectively.
Group D 26/08/2022 (Afternoon)
(a) 36 and 12 (b) 24 and18
(c) 54 and 8 (d) 72 and 24

Q.15. If GCD(108, 36) = GCD(x, 72) then what is the minimum possible value of x?
Group D 29/08/2022 (Morning)
(a) 72 (b) 36 (c) 12 (d) 24

Q.16. The sum of two natural numbers, x and y, is 320 and the HCF of x and y is 20. If x>y, how many such possible pairs of x and y are there?
Group D 29/08/2022 (Evening)
(a) 6 (b) 4 (c) 8 (d) 2

Q.17. If X represents the smallest prime number multiplied by 4 and added to the least common multiple of 5 and 10; Y represents the smallest odd prime number multiplied by 5 and added to the 2nd smallest odd prime, then which of the following is true?
Group D 30/08/2022 (Evening)
(a) X and Y are equal.
(b) X + Y = 10.
(c) X is greater than Y.
(d) The difference of Y and X is 2.

Q.18. What is the smallest natural number that should be added to 1225 such that a remainder of 3 is left when the resulting number is divided by each of the numbers 12, 18, 21 and 28?
Group D 05/09/2022 (Evening)
(a) 38 (b) 43 (c) 41 (d) 35

Q.19. Nandan had some marbles. When he distributed those marbles equally among 15 children, he found that he was

left with 2 marbles. If he had distributed those marbles equally among 24 children and 32 children, he would have been left with 11 and 19 marbles respectively. But when he distributed those marbles equally among the 31 children, he was not left with a single marble. Initially the number of marbles that Nandan had can be between _____.
Group D 06/09/2022 (Morning)
(a) 2350 and 2360 (b) 2370 and 2380
(c) 2360 and 2370 (d) 2380 and 2390

Q.20. Two positive numbers differ by 3422. When the greater number is divided by the smaller number, the quotient is 4 and the remainder is 290. What is the HCF of the greater of the two given numbers and 4292?
Group D 08/09/2022 (Morning)
(a) 148 (b) 74 (c) 116 (d) 58

Q.21. Rajesh has 180 litres of Oil A and 220 litres of Oil B. He fills a number of identical containers with the two types of oil in a manner that each container has only one type of oil, and all containers are completely filled. What can be the maximum volume (in litres) of each container that Rajesh uses, so that all the oil that Rajesh has, of both the types, can be poured into these containers?
Group D 08/09/2022 (Afternoon)
(a) 80 (b) 20 (c) 40 (d) 60

Q.22. The HCF of $(X^4 - Y^4)$, $(X^8 - Y^8)$ and $(X^2 - Y^2)$ is:
Group D 08/09/2022 (Evening)
(a) (X – Y) (X + Y)
(b) (X - Y) (X + Y) (X - Y) (X + Y)
(c) (X - Y) (X + Y) (X + Y)
(d) (X + Y) (X + Y)

Q.23. The highest common factor of any two distinct prime numbers is:
Group D 09/09/2022 (Evening)
(a) 3 (b) 0 (c) 2 (d) 1

Q.24. Which of the following is a pair of co-prime numbers?
Group D 12/09/2022 (Afternoon)
(a) 81, 16 (b) 363, 77
(c) 455, 49 (d) 52, 24

Q.25. The greatest number which divides 1876, 12503 and 6877 leaving 1,3 and 2 respectively is:
Group D 15/09/2022 (Morning)
(a) 675 (b) 625 (c) 555 (d) 655

Q.26. A farmer plants three different types of plants in equal numbers in a garden. All plants of a type are planted to form a rectangle, in which no rectangle contains more than one type, and no plants of any type are left out. After all the plants were planted, the aisle with Plant A had 70 rows, the rectangle with Plant B had 28 rows, and the rectangle with Plant C had 42 rows. Find the minimum number of plants of each type planted by the farmer in the garden.
Group D 16/09/2022 (Afternoon)
(a) 140 (b) 210 (c) 420 (d) 70

Q.27. Let R be the greatest number which when divides 41, 71 and 91 leaves the same remainder. Find the LCM of R and 45.
Group D 20/09/2022 (Morning)
(a) 45 (b) 90 (c) 75 (d) 10

Q.28. Consider two numbers whose LCM + HCF = 504, and LCM - HCF = 456. If one of these two numbers is 96, find the other number.
Group D 27/09/2022 (Afternoon)
(a) 100 (b) 126 (c) 120 (d) 130

Q.29. The LCM of fractions is calculated as $\frac{LCM\ of\ the\ numerators}{HCF\ of\ the\ denominators}$. Find the LCM of $\frac{5}{6}, \frac{6}{5}$ and $\frac{3}{2}$.
Group D 28/09/2022 (Afternoon)
(a) 25 (b) 30 (c) 15 (d) 20

Q.30. Find the ratio between the LCM and the HCF of 5, 15, and 20.
Group D 30/09/2022 (Morning)
(a) 14 : 3 (b) 8 : 1 (c) 12 : 1 (d) 11 : 2

Q.31. The LCM and the HCF of two numbers, x and y, are 286 and 2, respectively. If the sum of these two numbers is 48. then the value of $\frac{1}{x} + \frac{1}{y}$ is:
Group D 06/10/2022 (Evening)
(a) $\frac{572}{48}$ (b) $\frac{24}{167}$ (c) $\frac{48}{571}$ (d) $\frac{12}{143}$

Q.32. K is the product of the greatest and the smallest of the numbers $\frac{1}{4}, \frac{2}{3}, \frac{4}{5}, \frac{5}{8}$, $\frac{3}{4}$ .Find the value of $\left(\frac{1}{k} + 4\right)\left(\frac{1}{k} - 2\right)$
NTPC CBT II Level 6 (09/05/2022) Shift 1
(a) $\frac{189}{25}$ (b) 27 (c) $\frac{171}{25}$ (d) 7

Q.33. In a school there are 360, 520 and 280 students in classes 5, 6, and 7 respectively. Buses are to be hired to take these students for a trip. Find the maximum number of students who can be accommodated in each bus if each bus must take the same number of students, and each bus should have students from the same class.
NTPC CBT II Level 6 (09/05/2022) Shift 2
(a) 20 (b) 40 (c) 30 (d) 50

Q.34. If $x = 2^3 \times 3^2 \times 5 \times 7^3$, $y = 2^2 \times 3^3 \times 5^2 \times 7^2$, and $z = 2^4 \times 3 \times 5^3 \times 7$, Then the HCF of x, y and z is:
NTPC CBT II Level 3 (14/06/2022) Shift 1
(a) 420 (b) 1260 (c) 840 (d) 630

Q.35. In a school, the number of students in Grades 6, 7 and 8 was 184, 276, and 322,respectively. Students in each grade were divided into different sections, but every section across grades had the same number of students . For each section, a class teacher was appointed . What was the minimum number of class teachers required for the purpose?
NTPC CBT II Level 5 (15/06/2022) Shift 1
(a) 18 (b) 46 (c) 23 (d) 17

Q.36. Find the HCF of (a - b)(a + 2b), $(a^2 - b^2)$(a+ 2b), (a + b),$(a^2 - b^2)$, where a > b > 0
NTPC CBT II Level 3 (17/06/2022) Shift 1
(a) a + b (b) a + 2b (c) a - 2b (d) a - b

Q.37. When 4230, 5986 and 9059 are divided by the greatest number m, the remainder in each case is n. What is the value of (m - n)?
NTPC CBT II Level 3 (17/06/2022) Shift 2
(a) 160 (b) 159 (c) 153 (d) 163

Q.38. The smallest square number which is exactly divisible by 12, 15 and 18 is
NTPC CBT - I 28/12/2020 (Evening)
(a) 625 (b) 1225 (c) 900 (d) 400

Q.39. 24 mango trees, 56 apple trees and 72 orange trees have to be planted in rows such that each row contains the same number of trees of one variety only. Find the minimum number of rows in which the above mentioned trees may be planted?
NTPC CBT - I 04/01/2021 (Evening)
(a) 19 (b) 17 (c) 18 (d) 15

Q.40. Find the HCF of $\frac{2}{3}, \frac{4}{9}, \frac{8}{15,} \frac{10}{21}$
NTPC CBT - I 11/01/2021 (Morning)
(a) $\frac{315}{4}$ (b) $\frac{2}{315}$ (c) $\frac{4}{315}$ (d) $\frac{315}{2}$

Q.41. Find the HCF of $(3^{45} - 1)$ and $(3^{55} - 1)$.
NTPC CBT - I 17/01/2021 (Morning)
(a) 728 (b) 81 (c) 80 (d) 242

Q.42. What is the product of LCM and HCF of 18 and 42?
NTPC CBT - I 18/01/2021 (Evening)
(a) 746 (b) 736 (c) 756 (d) 766

Q.43. If the HCF of 51 and 85 is expressed in the form of 51m - 85, then the value of m will be:
NTPC CBT - I 20/01/2021 (Morning)
(a) 1 (b) 5 (c) 3 (d) 2

Q.44. If P = a × m × r and Q = b × m × 2 × r, where a, b, m, r are odd primes. Then the HCF of P and Q is..
NTPC CBT - I 21/01/2021 (Evening)
(a) a r (b) b r (c) 2 r (d) m r

Q.45. A number lies between the cubes of 11 and 12. If the number is divisible by twice of 80 and 6 both, what will the number?
NTPC CBT - I 29/01/2021 (Morning)
(a) 1350 (b) 1560 (c)1680 (d)1440

Q.46. The LCM of two positive integers is thrice the larger number. The difference of the smaller number and the HCF of two numbers is 6. The smaller number is:
NTPC CBT - I 31/01/2021 (Evening)
(a) 9 (b) 5 (c) 11 (d) 7

Q.47. If a, b,c,d are four numbers, such that the LCM of a and b is b, the LCM of b and c is c and the LCM of c and d is d. then the LCM of a,b, c, and d will be:
NTPC CBT - I 03/02/2021 (Morning)
(a) d (b) $\frac{(a+b+c+d)}{4}$ (c) a (d) c

Q.48. The HCF of two numbers is 19 and the other two factors of their LCM are 11 and 13. The larger of the two numbers is:
NTPC CBT - I 04/02/2021 (Evening)
(a) 241 (b) 243 (c) 247 (d) 249

Q.49. If the sum of two numbers is 84 and their HCF and LCM are 3 and 124 respectively, the sum of the reciprocals of the two numbers will be:
NTPC CBT - I 04/02/2021 (Evening)
(a) $\frac{11}{31}$ (b) $\frac{9}{31}$ (c) $\frac{8}{31}$ (d) $\frac{7}{31}$

Q.50. Three different containers contain a mixture of milk and water, measuring 403 litres, 434 litres and 465 litres, respectively. The biggest measure required to measure all the different quantities exactly is.
NTPC CBT - I 11/02/2021 (Morning)
(a) 41 litres (b) 32 Litres
(c) 31 litres (d) 7 litres

Q.51. The HCF and LCM of two numbers is 10^8 and $10^{12}7^3$ Respectively. If one of the numbers is 10^{12}, then the other number is _____.
NTPC CBT - I 11/02/2021 (Evening)
(a) 10×7^3 (b) $10^{10} \times 7^3$
(c) $10^{12} \times 7^3$ (d) $10^8 \times 7^3$

Q.52. If the LCM of p and q is pq , then the numbers of p, q must be :
NTPC CBT - I 12/02/2021 (Morning)
(a) even (b) odd
(c) prime (d) composite numbers

Q.53. Two positive numbers are in the ratio 5 : 4 and the product of their LCM and HCF is 18000. Find the sum of the two numbers.
NTPC CBT - I 02/03/2021 (Morning)
(a) 270 (b) 180 (c) 150 (d) 900

Q.54. The LCM of $(a^3 + b^3)$ and $(a^4 - b^4)$ is:
NTPC CBT - I 08/03/2021 (Morning)
(a) $(a^3 + b^3)(a^2 - b^2)(a - b)$
(b) $(a + b)(a^2 + ab + b^2)$
(c) $(a^3 + b^3)(a^2 + b^2)(a + b)$
(d) $(a^3 + b^3)(a^2 + b^2)(a - b)$

Q.55. The LCM of two prime numbers x and y (x > y) is 119. The value of 3y - x is:
NTPC CBT - I 14/03/2021 (Morning)
(a) 6 (b) 2 (c) 4 (d) 8

Q.56. Find the least square number that is exactly divisible by 4, 5, 6, 15 and 18.
NTPC CBT - I 21/03/2021 (Morning)
(a) 3600 (b) 32400 (c) 8100 (d) 900

Q.57. What is the smallest sum of money which contains Rs.2.50, Rs. 20, Rs. 1.20 and Rs. 7.50?
NTPC CBT - I 03/04/2021 (Evening)
(a) Rs. 1.20 (b) Rs. 60 (c) Rs.40 (d) Rs. 5

Q.58. After spending $\frac{1}{4}$th of pocket money on chocolates and $\frac{1}{8}$th on pizza, a girl is left with Rs.40. How much money did she have at first?
RRB JE 23/05/2019 (Morning)
(a) Rs.100 (b) Rs.64 (c) Rs.52 (d) Rs.80

Q.59. What is the GCD of these polynomials?
$(x^3 + x^2 + x + 1)$ and $(x^3 + 2x^2 + x + 2)$?
RRB JE 23/05/2019 (Evening)
(a) (x + 1)(x + 2) (b) (x + 1)
(c) $(x^2 + 1)$ (d) $(x^2 + 1)(x + 1)(x + 2)$

Q.60. LCM of two numbers 'p' and 'q' is 935 and (p>q). What is the maximum sum of the digits of 'q' out of the possible pairs 'p', 'q'?
RRB JE 30/05/2019 (Afternoon)
(a) 8 (b) 20 (c) 5 (d) 13

Q.61. Find the HCF of $(a^3 + b^3)$, $(a + b)^2$ and $(a^2 - b^2)$
RRB JE 31/05/2019 (Evening)
(a) (a + b) (b) (a - b)
(c) (a + b) (a - b) (d) $(a^3 + b^3)(a^2 - b^2)$

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.62. The HCF of two numbers is 7 and their LCM is 434. If one of the numbers is 14, find the other.
Group D 17/08/2022 (Evening)
(a) 146 (b) 217 (c) 52 (d) 48

Q.63. The HCF of 108 and 144 is
Group D 18/08/2022 (Evening)
(a) 36 (b)16 (c) 24 (d) 12

Q.64. Two numbers are in the ratio 5 : 7. If their HCF is 17, then find the numbers.
Group D 22/08/2022 (Morning)
(a) 85, 119 (b) 102, 136
(c) 68, 85 (d) 85, 102

Q.65. The product of two numbers is 1472 and their HCF is 8. Find their LCM.
Group D 22/08/2022 (Evening)
(a) 144 (b) 108 (c) 184 (d) 176

Q.66. The HCF of 45, 78 and 117 is:
Group D 23/08/2022 (Morning)
(a) 9 (b) 5 (c) 7 (d) 3

Q.67. Find the least number which when added to 2488, then number obtained will be completely divisible by 3, 4, 5 and 6.
Group D 23/08/2022 (Evening)
(a) 34 (b) 28 (c) 42 (d) 32

Q.68. Find the least six-digit number that is exactly divisible by 8, 10, 12 and 16.
Group D 24/08/2022 (Evening)
(a) 100040 (b) 100020
(c) 100060 (d) 100080

Q.69. What is the least 5-digit number, which when divided by 15, 24, 35 and 42, the remainder in each case is 13?
Group D 25/08/2022 (Morning)
(a) 10067 (b) 10073
(c) 10093 (d) 10106

Q.70. The sum of two positive integers is 55. If their HCF and LCM are 5 and 120, respectively, then the sum of their reciprocals is.....
Group D 25/08/2022 (Morning)
(a) $\frac{120}{13}$ (b) $\frac{11}{120}$ (c) $\frac{14}{6}$ (d) $\frac{12}{13}$

Q.71. Which of the following pairs of numbers is co-prime?
Group D 25/08/2022 (Afternoon)
(a) (17, 23) (b) (14, 21)
(c) (15,25) (d) (12, 24)

Q.72. The LCM of two numbers is 385 and their HCF is 7. If the sum of the two numbers is 112, then their difference is:
Group D 25/08/2022 (Evening)
(a) 50 (b) 35 (c) 42 (d) 43

Q.73. Find the greatest number by which when the numbers 57, 95 and 211 are divided, it leaves the same remainder in each case.
Group D 26/08/2022 (Morning)
(a) 3 (b) 4 (c) 1 (d) 2

Q.74. If the sum of two numbers is 54 and the LCM and HCF of these numbers are 84 and 6, respectively, then the sum of the reciprocal of the numbers is:
Group D 29/08/2022 (Afternoon)
(a) $\frac{7}{28}$ (b) $\frac{3}{28}$ (c) $\frac{5}{28}$ (d) $\frac{9}{28}$

Q.75. Two numbers are in the ratio 3 : 2. Their LCM and HCF are 24 and 4, respectively. The greater of the two numbers is:
Group D 29/08/2022 (Evening)
(a) 8 (b) 12 (c) 14 (d) 10

Q.76. If X is the greatest number that can divide 3808, 4798 and 5128 leaving the same remainder 13, then the sum of digits in X is:
Group D 30/08/2022 (Morning)
(a) 18 (b) 12 (c) 14 (d) 16

Q.77. The LCM and HCF of two numbers are 1920 and 4, respectively. If one of the numbers is 60 then the other number is_____.
Group D 30/08/2022 (Afternoon)
(a)140 (b) 130 (c) 117 (d) 128

Q.78. If the HCF and LCM of two numbers are 7 and 245, respectively, then their product is:
Group D 30/08/2022 (Evening)
(a) 1175 (b) 1715 (c) 1751 (d) 1517

Q.79. The product of the LCM and HCF of two numbers is 48. If the two numbers differ by 13, then find the numbers.
Group D 01/09/2022 (Morning)
(a) 3 and 16 (b) 4 and 17
(c) 11 and 24 (d) 12 and 25

Q.80. Three numbers are in the ratio 1 : 2 : 5 and their LCM is 1600. Find the HCF of the numbers.
Group D 01/09/2022 (Afternoon)
(a) 800 (b) 320 (c) 160 (d) 480

Q.81. If the product of two numbers, not necessarily distinct from each other, is 25 and their HCF is 5, then their LCM is:
Group D 01/09/2022 (Evening)
(a) 4 (b) 7 (c) 6 (d) 5

Q.82. If the ratio of two numbers is 4 : 3 and the product of their LCM and their HCF is 432, then the sum of the reciprocals of the LCM and the HCF is:
Group D 01/09/2022 (Evening)
(a) $\frac{13}{72}$ (b) $\frac{13}{27}$ (c) $\frac{13}{7}$ (d) $\frac{13}{2}$

Q.83. The sum of two numbers is 35 and their LCM is 306. The two numbers are:
Group D 02/09/2022 (Morning)
(a) 16, 19 (b) 14, 21 (c) 17, 18 (d) 13, 22

Q.84. Four bells ring at intervals of 4 minutes, 8 minutes, 12 minutes, and 24 minutes respectively. All the four bells rang together at 12 noon. How many times after 12 noon will all the four bells ring together in the next four hours, with the ringing at 4 p.m. being included?
Group D 02/09/2022 (Afternoon)
(a) 10 times (b) 9 times
(c) 8 times (d) 11 times

Q.85. If the product of two numbers is 8410 and their HCF is 29, then their LCM is:
Group D 05/09/2022 (Morning)
(a) 330 (b) 290 (c) 270 (d) 310

Q.86. The smallest four-digit number that is exactly divisible by each of 24, 40 and 56 is:
Group D 05/09/2022 (Afternoon)
(a) 1080 (b) 1680 (c) 1260 (d) 1170

Q.87. Let x be the greatest number which on dividing 7072, 8505 and 9925 leaves remainders 22, 45 and 55 respectively. Find the sum of the digits of x.
Group D 06/09/2022 (Morning)
(a) 6 (b) 5 (c) 7 (d) 8

Q.88. A conference is being organized by an educational institution, where the participants will be teachers of different subjects. The number of participants in Physics, Chemistry and Mathematics are 112, 144 and 192 respectively. Equal number of participants are to be seated in each room, and all the participants sitting in a room should be teachers of the same subject. Find the minimum number of rooms required for the event.
Group D 06/09/2022 (Afternoon)
(a) 35 (b) 23 (c) 32 (d) 28

Q.89. In finding the Highest common factor (HCF) of two numbers by division method, the quotients are 1, 5 and 2 respectively, and the last divisor is 15. Find the least common multiple (LCM) of those two numbers.
Group D 06/09/2022 (Evening)
(a) 2130 (b) 3045 (c) 2115 (d) 2145

Q.90. When 1833, 2482 and 3190 are divided by the greatest number x, the remainder in each case is y. What is the value of (3x - 14y)?
Group D 08/09/2022 (Afternoon)
(a) 133 (b) 131 (c) 121 (d) 123

Q.91. The HCF and LCM of two numbers are 24 and 456, respectively. If one number is 96, then the other number is:
Group D 08/09/2022 (Evening)
(a) 192 (b) 112 (c) 114 (d) 216

Q.92. The least 3-digit number that is completely divisible by 8 and 12 is:
Group D 12/09/2022 (Morning)
(a) 120 (b) 144 (c) 108 (d) 124

Q.93. The greatest number which divides 72 and 122 leaving remainders 3 and 7, respectively, is:
Group D 12/09/2022 (Afternoon)
(a) 27 (b) 17 (c) 23 (d) 26

Q.94. If the ratio of two numbers is 5 : 7, and HCF is 8, then their LCM is:
Group D 13/09/2022 (Morning)
(a) 480 (b) 380 (c) 280 (d) 580

Q.95. The LCM and the HCF of two numbers are given as 459 and 3, respectively. If one number is 51, then find the other number.
Group D 13/09/2022 (Morning)
(a) 37 (b) 21 (c) 27 (d) 33

Q.96. The HCF and the LCM of two numbers are 1080 and 30240, respectively. If one of the numbers is 4320, then the other number is _____
Group D 13/09/2022 (Afternoon).
(a) 1080 (b) 8640 (c) 30240 (d) 7560

Q.97. Two numbers are in the ratio 11 : 17 and the difference between the numbers is 18. The HCF and the LCM of these numbers, respectively, are:
Group D 14/09/2022 (Afternoon)
(a) 9 and 567 (b) 7 and 563
(c) 3 and 561 (d) 5 and 569

Q.98. The LCM of two numbers is 1260 and their HCF is 30. If one of the two numbers is 180, find the other number.
Group D 14/09/2022 (Afternoon)
(a) 240 (b) 270 (c) 200 (d) 210

Q.99. Three numbers are in the ratio 5 : 6 : 8 and their LCM is 1200. The sum of the numbers is:
Group D 14/09/2022 (Evening)
(a) 180 (b) 210 (c) 200 (d) 190

Q.100. The HCF and the LCM of two

numbers are 44 and 264, respectively. If one of the numbers is $\frac{3}{2}$ times of the other, what is the smaller number?
Group D 16/09/2022 (Morning)
(a) 132 (b) 44 (c) 88 (d) 176

Q.101. If the sum of the LCM and the HCF of two numbers is 1050 and if their HCF is 630 less than their LCM, then the product of those two numbers is _____.
Group D 16/09/2022 (Morning)
(a) 661500 (b) 63000
(c) 10500 (d) 176400

Q.102. The highest common factor of a set of coprime numbers is equal to:
Group D 16/09/2022 (Evening)
(a) the highest among them
(b) 1
(c) 2
(d) the lowest among them

Q.103. The LCM of two numbers is 588. Which of the following CANNOT be their HCF?
Group D 16/09/2022 (Evening)
(a) 49 (b) 21 (c) 35 (d) 28

Q.104. Find the smallest natural number that can be divided by the first five 2-digit positive even numbers without leaving a remainder.
Group D 17/09/2022 (Morning)
(a) 5340 (b) 5560 (c) 5040 (d) 5120

Q.105. The traffic signals at three different road crossings change after every 45 seconds, 75 seconds and 90 seconds respectively. If they all change simultaneously at 9:30:00 a.m., then at what time will they next change again simultaneously?
Group D 17/09/2022 (Afternoon)
(a) 9 : 39 : 20a.m. (b) 9 : 38 : 00 a.m.
(c) 9 : 39 : 10 a.m. (d) 9 : 37 : 30 a.m.

Q.106. Three numbers are co-prime to one another and the product of the first two and the last two are 432 and 945, respectively. Find the LCM of the three numbers._____
Group D 17/09/2022 (Evening)
(a) 14850 (b) 15120 (c) 16650 (d) 15030

Q.107. The greatest number, which divides 2000 and 2200 to leave 22 and 38 respectively as remainders, is:
Group D 18/09/2022 (Afternoon)
(a) 36 (b) 42 (c) 39 (d) 46

Q.108. The greatest number which on dividing 50, 58 and 69 leaves remainders of 1, 2 and 6, respectively, is :
Group D 19/09/2022 (Morning)
(a) 7 (b) 8 (c) 0 (d) 6

Q.109. Find the scale with the greatest possible length which can measure poles of length 3 m 96 cm, 5m 28 cm, and 7 m 92 em exact number of times.
Group D 19/09/2022 (Afternoon)
(a) 3 m 21 cm (b) 33 cm
(c) 66 cm (d) 1 m 32 cm

Q.110. The HCF and the LCM of two numbers are 15 and 300, respectively. If the difference of the two numbers is 15, find the sum of those two numbers.
Group D 19/09/2022 (Afternoon)
(a) 130 (b) 140 (c) 135 (d) 145

Q.111. The product of the HCF and the LCM of 4, 20, 28 is:
Group D 19/09/2022 (Evening)
(a) 140 (b) 564 (c) 136 (d) 560

Q.112. If the HCF of two numbers is 6 and the product of the numbers is 2520, find their LCM.
Group D 20/09/2022 (Evening)
(a) 1320 (b) 420 (c) 880 (d) 2520

Q.113. The product of two numbers is 2160 and their HCF is 12. One of the possible pairs of numbers is:
Group D 22/09/2022 (Morning)
(a) (35, 60) (b) (12, 185)
(c) (12, 184) (d) (36, 60)

Q.114. Find the smallest natural number which, when divided by 9, 24 and 12, leaves a remainder 4 in each case but when divided by 5 leaves no remainder.
Group D 22/09/2022 (Afternoon)
(a) 220 (b) 144 (c) 150 (d) 148

Q.115. Three bells A, B and C toll every 15 seconds, 24 seconds, and 42 seconds, respectively. If all of them toll together at 8 a.m., then between 8 a.m. and 10 a.m. on the same day, how many times will they all toll together, including the one at 8 a.m.?
Group D 26/09/2022 (Morning)
(a) 7 (b) 6 (c) 9 (d) 8

Q.116. In a seminar, the number of participants in subjects A, B and C are 96, 160 and 224, respectively. Find the minimum number of rooms required, if in each room the same number of participants are seated and all participants in a room are from the same subject.
Group D 26/09/2022 (Afternoon)
(a) 32 (b) 12 (c) 24 (d) 15

Q.117. 44, 96 and 184, when divided by a number x, leaves the same remainder in each case. The largest value of x is:
Group D 26/09/2022 (Afternoon)
(a) 6 (b) 4 (c) 3 (d) 8

Q.118. The LCM and the HCF of two numbers are 5005 and 77, respectively. When one of the two numbers is divided by 55, the quotient is 18 and the remainder is 11. The other number is:
Group D 26/09/2022 (Evening)
(a) 330 (b) 385 (c) 418 (d) 440

Q.119. Three numbers are in the ratio 3 : 5 : 7 and their LCM is 5250. What is the middle number?
Group D 27/09/2022 (Morning)
(a) 150 (b) 250 (c) 200 (d) 350

Q.120. If the sum of two numbers is 48, while the HCF of these two numbers is 6, then the total number of such pairs of numbers (x, y), where x>y, is:
Group D 27/09/2022 (Evening)
(a) 3 (b) 4 (c) 1 (d) 2

Q.121. The product of the LCM and the HCF of two numbers is 270. If one of the numbers is 18, find the other number:
Group D 28/09/2022 (Morning)
(a) 15 (b) 30 (c) 20 (d) 27

Q.122. What is the highest common prime factor of 7140 and 13200?
Group D 28/09/2022 (Afternoon)
(a) 5 (b) 3 (c) 11 (d) 2

Q.123. The product of the LCM and the HCF of 18 and 25 is:
Group D 28/09/2022 (Evening)
(a) 465 (b) 270 (c) 450 (d) 360

Q.124. The HCF of fractions is calculated as $\frac{HCF\ of\ the\ numerators}{LCM\ of\ the\ denominators}$. find the HCF of $\frac{2}{3}$, $\frac{4}{5}$ and $\frac{3}{2}$.
Group D 29/09/2022 (Evening)
(a) $\frac{5}{30}$ (b) $\frac{3}{50}$ (c) $\frac{1}{30}$ (d) $\frac{1}{40}$

Q.125. Find the HCF of 0.24 and 0.36.
Group D 29/09/2022 (Evening)
(a) 0.72 (b) 0.12 (c) 0.32 (d) 0.52

Q.126. Four bells toll at intervals of 2, 4, 6 and 8 seconds, respectively. They chimed together at 12 noon. How many times will they chime together in the next 50 minutes, excluding their chiming at 12 noon, but including the one at 12 : 50 p.m.?
Group D 30/09/2022 (Afternoon)
(a) 126 (b) 123 (c) 125 (d) 124

Q.127. The LCM of two numbers is 14 times their HCF. If one of the numbers is

36 and the sum of the LCM and the HCF is 270, then the other number is:
Group D 06/10/2022 (Morning)
(a) 126 (b) 144 (c) 252 (d) 234

Q.128. The LCM of two numbers is 20 times their HCF and their HCF is 213. If one of the two numbers is divided by 225, the quotient is 4 and the remainder is 165. The other number is:
Group D 06/10/2022 (Afternoon)
(a) 639 (b) 852 (c) 426 (d) 1065

Q.129. The LCM of two numbers is 10 times their HCF and the sum of the LCM and the HCF is 451. If the sum of the numbers is 287, then one of the two numbers is:
Group D 07/10/2022 (Morning)
(a) 82 (b) 41 (c) 123 (d) 164

Q.130. If 5 is subtracted from x, then the resulting number is exactly divisible by 18, 16, 24 and 32. The smallest value of x is: Group D 07/10/2022 (Morning)
(a) 293 (b) 288 (c) 581 (d) 283

Q.131. Let n be the least number which when divided by 15, 18, 20 and 27, the remainder in each case is 3 and n is divisible by 53. What is the sum of the digits of n?
Group D 07/10/2022 (Afternoon)
(a) 10 (b) 12 (c) 9 (d) 13

Q.132. Two numbers, whose LCM is 416 and HCF is 2, are in the ratio 13 : 16. Find the greater of these two numbers.
Group D 07/10/2022 (Afternoon)
(a) 32 (b) 26 (c) 34 (d) 42

Q.133. The HCF of two numbers is 47. If the product of the two numbers is 6627, then the larger number between these two numbers is:
Group D 07/10/2022 (Evening)
(a) 94 (b) 188 (c) 141 (d) 235

Q.134. If the HCF of 408 and 1032 is expressed as 516m −252 × 4, then m is:
Group D 11/10/2022 (Morning)
(a) −6 (b) 6 (c) −2 (d) 2

Q.135. If a and b are two co-prime numbers, then their LCM is:
Group D 11/10/2022 (Morning)
(a) a + b (b) a × b
(c) $\frac{a-b}{a+b}$ (d) $a - b$

Q.136. A tailor has 22 metres of cloth and he has to cut each metre of cloth into 5 pieces. How many pieces can he get from the 22 metres of cloth he has?
Group D 11/10/2022 (Afternoon)
(a) 11 (b) 55 (c) 110 (d) 1110

Q.137. Find the smallest number, which when tripled, will leave the remainder as zero on being divided by 5, 15 and 35.
Group D 11/10/2022 (Afternoon)
(a) 70 (b) 150 (c) 35 (d) 100

Q.138. While packing birthday caps for a party in packs of 8 or 10, one cap was always left out. How many caps were there if there were more than 250 but less than 300 caps in the lot?
Group D 11/10/2022 (Evening)
(a) 275 (b) 268 (c) 281 (d) 261

RRB NTPC CBT - 2 (09/05/2022 to 17/06/2022)

Q.139. The HCF of 1638, 2244 and 5049 is x. Then sum of digits of x is:
Level 4 (10/05/2022) Shift 1
(a) 15 (b) 11 (c) 13 (d) 12

Q.140. k is the greatest number which, when divides 2996, 4752 and 7825, the remainder in each case is the same. The product of the digit of k is
Level 4 (10/05/2022) Shift 1
(a) 12 (b) 84 (c) 72 (d) 108

Q.141. Let N be the least number which when divided by 15, 25, 35, 40 and 42, the remainder in each case is 1 and N is divisible by 271. What is the sum of digits of N?
Level 4 (10/05/2022) Shift 1
(a) 17 (b) 14 (c) 13 (d) 18

Q.142. What is the smallest cubic number, which is divisible by 72, 108 and 300?
Level 5 (12/06/2022) Shift 1
(a) 3375 (b) 27000 (c) 5400 (d) 21600

Q.143. The LCM of two numbers is 20 times their HCF, and the sum of the LCM and the HCF is 504. If the difference of the numbers is 24. Then find the sum of the numbers.
Level 5 (12/06/2022) Shift 1
(a) 210 (b) 180 (c) 225 (d) 216

Q.144. What is the difference between the LCM and the HCF of 24 and 18?
Level 5 (12/06/2022) Shift 2
(a) 72 (b) 6 (c) 24 (d) 66

Q.145. The LCM of two numbers is 35 times their HCF.The LCM and HCF differ by 238. If the two numbers differ by 14, then find the sum of the numbers.
Level 5 (12/06/2022) Shift 2
(a) 84 (b) 82 (c) 86 (d) 83

Q.146. The ratio of two numbers is 11 : 4 and their HCF is 16. What is the sum of these two numbers?
Level 2 (13/06/2022) Shift 1
(a) 320 (b) 240 (c) 256 (d) 224

Q.147. A circus runs two shows, one with a lion and another with an elephant, separately. The show with the elephant runs for 80 minutes, and the show with the lion runs for 120 minutes. Both shows start at 6 pm. At what time will both shows start again at the same time?
Level 2 (13/06/2022) Shift 1
(a) 10 : 00 pm (b) 7 : 40 pm
(c) 7 : 00 pm (d) 8 : 20 pm

Q.148. The least perfect square which is divisible by each of 27,54 and 72 is
Level 2 (13/06/2022) Shift 1
(a) 1296 (b) 1225 (c) 1369 (d) 1156

Q.149. *x* is the smallest six-digit number which, when divided by 20, 21, 22, 24 and 28, the remainder in each case is 5. What will be the quotient when *x* is divided by 462?
Level 2 (13/06/2022) Shift 2
(a) 224 (b) 220 (c) 221 (d) 226

Q.150. When 6892,7105 and 7531 are divided by the greatest number x, then the remainder in each case is the same. The sum of the digit of x is:
Level 3 (14/06/2022) Shift 1
(a) 9 (b) 7 (c) 13 (d) 6

Q.151. Let x be the least four-digital number which when divided by 18, 27, 30, 40 and 45, the remainder in each case is 9. Find the remainder when x is divided by 37.
Level 3 (14/06/2022) Shift 2
(a) 16 (b) 23 (c) 15 (d) 28

Q.152. The HCF of two numbers is 8 and the product of the two numbers is 6400. How many pairs of numbers exist, which satisfy the above conditions?
Level 3 (14/06/2022) Shift 2
(a) 6 (b) 2 (c) 3 (d) 5

Q.153. The LCM of two numbers is 28 times their HCF, and the difference between LCM and HCF is 405. If the numbers are in the ratio 4 : 7, then find the positive difference between the numbers.
Level 5 (15/06/2022) Shift 1
(a) 49 (b) 45 (c) 52 (d) 42

Q.154. Find the HCF of $3x^2yz$, $5xy^2z$, $12x^2y^2z^3$.
Level 5 (15/06/2022) Shift 2

(a) 180xyz (b) xyz
(c) $180x^5y^5z^5$ (d) $180x^2y^2z^3$

Q.155. The HCF of two different numbers is always 1, when:
Level 5 (15/06/2022) Shift 3
(a) One number is odd and the other number is even
(b) both numbers are prime numbers
(c) both numbers are even numbers
(d) both numbers are odd numbers

Q.156. What is the largest number that will divide both 288 and 468 without leaving any remainder?
Level 2 (16/06/2022) Shift 1
(a) 39 (b) 36 (c) 72 (d) 18

Q.157. The number of students in grades 10,11 and 12 of a school are 384, 256 and 480 respectively . All students were divided into different groups, with no group having students from more than one grade. What is the minimum number of groups that would be formed if all the groups have the same number of students?
Level 2 (16/06/2022) Shift 2
(a) 36 (b) 30 (c) 32 (d) 35

Q.158. Find the greatest possible number which on dividing 2307 and 3105 leaves remainders of 7 and 5 respectively.
Level 2 (16/06/2022) Shift 3
(a) 105 (b) 102 (c) 110 (d) 100

Q.159. Three numbers are in the ratio 17:25:66 and their HCF is 18. The smallest number among them is :
Level 3 (17/06/2022) Shift 1
(a) 378 (b) 360 (c) 306 (d) 342

Q.160. Let x be the least number lying between 8000 and 8500, which when divided by 12, 14, 16, 35, and 84, the remainders are 4, 6, 8, 27, and 76, respectively. The tens digit in x is:
Level 3 (17/06/2022) Shift 2
(a) 9 (b) 7 (c) 8 (d) 5

Q.161. Kiran has 24 white beads and Resham has 18 black beads. They want to arrange the beads in such a way that each row contains an equal number of beads and each row must contain either only black beads or only white beads. What is the greatest number of beads that can be arranged in a row?
Level 3 (17/06/2022) Shift 2
(a) 8 (b) 3 (c) 6 (d) 12

Q.162. Ravi has 1530 eggs with him while Vinita has 2380 eggs with her that needs to be placed in cartons. What is the maximum number of eggs that each carton should hold so that both Ravi as well as Vinita find such cartons acceptable to use, leaving no empty space, nor having any egg unpacked?
Level 3 (17/06/2022) Shift 3
(a) 255 (b) 170 (c) 85 (d) 340

RRB NTPC CBT - 1 (28/12/2020 to 31/07/2021)

Q.163. The greatest number that will divide 155, 260, 315 and leave the remainder 5, 10 and 15 respectively is:
RRB NTPC 28/12/2020 (Morning)
(a) 10 (b) 75 (c) 25 (d) 50

Q.164. The smallest 5 digit number that leaves a remainder of 6 when divided by 7 is.
RRB NTPC 28/12/2020 (Morning)
(a) 10002 (b) 10009 (c) 10007 (d) 10003

Q.165. The sum of two numbers is 60 and their HCF and LCM are 12 and 72 respectively. The sum of the reciprocal of the two numbers is:
RRB NTPC 28/12/2020 (Morning)
(a) $\frac{5}{12}$ (b) $\frac{1}{5}$ (c) $\frac{5}{72}$ (d) $\frac{5}{6}$

Q.166. The sum of two numbers is 1500. Their LCM is 16379. Two numbers are
RRB NTPC 28/12/2020 (Evening)
(a) 1489, 11 (b) 1479, 21
(c) 1453, 47 (d) 1053, 447

Q.167. The smallest number which should be subtracted from the smallest number of four digits to make it a perfect square is.
RRB NTPC 28/12/2020 (Evening)
(a) 120 (b) 39 (c) 159 (d) 24

Q.168. Find the sum of the greatest 3 digit number and the smallest 4 digit number that have 24 as their HCF.
RRB NTPC 29/12/2020 (Morning)
(a) 1998 (b) 1992 (c) 1996 (d) 1892

Q.169. The sum and the difference between the LCM and HCF of two numbers are 369 and 351 respectively. If one number is 72, find the other number.
RRB NTPC 29/12/2020 (Morning)
(a) 85 (b) 90 (c) 45 (d) 75

Q.170. The least number that when divided by 144,108 and 72 leaves the remainder 3 in each case is.
RRB NTPC 29/12/2020 (Evening)
(a) 432 (b) 435 (c) 72 (d) 429

Q.171. How many numbers from 250 to 1000 are exactly divisible by 5, 6 and 7?
RRB NTPC 29/12/2020 (Evening)
(a) 6 (b) 7 (c) 5 (d) 3

Q.172. The LCM of two numbers is 156 and their HCF is 26. If the difference between the two numbers is also 26, then the sum of the numbers is.
RRB NTPC 29/12/2020 (Evening)
(a) 52 (b) 78 (c) 104 (d) 130

Q.173. What is the smallest number which when increased by 3 is divisible by 27, 35, 25, and 21 ?
RRB NTPC 30/12/2020 (Morning)
(a) 4728 (b) 317 (c) 4725 (d) 4722

Q.174. The sum of two positive numbers is 384 and their HCF is 24. How many pairs of such numbers can be formed?
RRB NTPC 30/12/2020 (Evening)
(a) 4 (b) 5 (c) 8 (d) 3

Q.175. The HCF of two numbers is 6 and their LCM is 84. If one of these numbers is 42, then the second number is.
RRB NTPC 04/01/2021 (Morning)
(a) 30 (b) 48 (c) 12 (d) 40

Q.176. The sum of two numbers is 288 and their HCF is 16. How many pairs of such numbers can be formed?
RRB NTPC 04/01/2021 (Evening)
(a) 3 (b) 5 (c) 4 (d) 2

Q.177. Find the sum of the numbers between 400 and 500 such that when 8,12, and 16 divide them, it leaves 5 as a remainder in each one.
RRB NTPC 04/01/2021 (Evening)
(a) 932 (b) 922 (c) 942 (d) 912

Q.178. The HCF of two numbers is 15 and their LCM is 225. If one of the numbers is 45, then what is the other number ?
RRB NTPC 05/01/2021 (Evening)
(a) $\frac{15 \times 45}{225}$ (b) $\frac{225}{45}$
(c) 225×15 (d) $\frac{15 \times 225}{45}$

Q.179. Five bells commence tolling together and toll at intervals of 2, 4, 6, 8, 20 seconds respectively. In 30 minutes, how many times do they toll together?
RRB NTPC 05/01/2021 (Evening)
(a) 18 (b) 15 (c) 14 (d) 16

Q.180. Since the HCF of(48, 144) is 48 therefore the LCM of (48, 144) = ?
RRB NTPC 07/01/2021 (Evening)
(a) 48 (b) 48 ×144 (c) 144 (d) 3

Q.181. Find the sum of the numbers between 400 and 600 such that when they are divided by 6, 12 and 16, there will be no remainder.

RRB NTPC 08/01/2021 (Evening)
(a) 2610 (b) 2620 (c) 2026 (d) 2016

Q.182. The least number which should be added to 4707 so that the sum is exactly divisible by 4, 5, 6 and 8 is
RRB NTPC 08/01/2021 (Evening)
(a) 63 (b) 73 (c) 83 (d) 93

Q.183. The LCM of two numbers is 91 times their HCF. The sum of the HCF and LCM is 2760. If one of the numbers is 210. Find the other number.
RRB NTPC 09/01/2021 (Morning)
(a) 30 (b) 2730 (c) 390 (d) 420

Q.184. The largest number which divides 55, 72 and 123 leaving the remainder 3, 7 and 6 respectively are:
RRB NTPC 09/01/2021 (Evening)
(a) 13 (b) 117 (c) 66 (d) 26

Q.185. The least number that is divisible by all the numbers from 2 to 10 is
RRB NTPC 10/01/2021 (Morning)
(a) 100 (b) 9 (c) 2520 (d) 504

Q.186. Find the smallest number by which 720 should be multiplied so that the product becomes a perfect square.
RRB NTPC 11/01/2021 (Morning)
(a) 4 (b) 3 (c) 6 (d) 5

Q.187. The LCM of two numbers is 24 times their HCF. The sum of the HCF and LCM is 750. If one of the numbers is 90, then find the other number.
RRB NTPC 11/01/2021 (Evening)
(a) 240 (b) 25 (c) 720 (d) 30

Q.188. LCM and HCF of two numbers are 1920 and 16 respectively. If one of the numbers is 240, then the other number is:
RRB NTPC 12/01/2021 (Morning)
(a) 128 (b) 150 (c) 182 (d) 112

Q.189. There are four table clocks. They ring every 10 min, 15 min, 20 min and 25 min respectively. If they all ring together at 10 a.m., Then at what time will they ring together again?
RRB NTPC 12/01/2021 (Evening)
(a) 3 : 30 p.m. (b) 10 : 00 p.m.
(c) 3 : 00 p.m. (d) 1200 a.m.

Q.190. The greatest number of four digits which is divisible by 15, 20, 25 and 45 is..
RRB NTPC 13/01/2021 (Morning)
(a) 9990 (b) 9000 (c) 9900 (d) 9090

Q.191. The HCF and LCM of 36 and N are 9 and 180 respectively. N is equal to.
RRB NTPC 13/01/2021 (Morning)
(a) 65 (b) 90 (c) 45 (d) 63

Q.192. Determine the LCM of $\frac{2}{3}, \frac{4}{9}, \frac{8}{15}$ and $\frac{10}{21}$.
RRB NTPC 13/01/2021 (Evening)
(a) $\frac{20}{3}$ (b) $\frac{3}{20}$ (c) $\frac{3}{40}$ (d) $\frac{40}{3}$

Q.193. Find three numbers such that their ratio is 3 : 4 : 5 and their HCF is 7.
RRB NTPC 16/01/2021 (Morning)
(a) 12; 16; 20 (b) 6; 8 ; 10
(c) 21; 28; 35 (d) 24; 32; 40

Q.194. Determine the smallest number which when divided by 12,16,20,25 and 30 leaves the same remainder 3 in each case.
RRB NTPC 16/01/2021 (Morning)
(a) 1023 (b) 1203 (c) 1303(d) 1233

Q.195. What will be the smallest number which on adding 25 to it, is exactly divisible by 25. 36 and 40?
RRB NTPC 16/01/2021 (Evening)
(a) 2225 (b) 25 (c) 3725 (d) 3575

Q.196. Find the least number which is divisible by first ten natural numbers.
RRB NTPC 17/01/2021 (Morning)
(a) 1040 (b) 77000 (c) 2520 (d) 5000

Q.197. The least number that should be added to 5474 so that the number is exactly divisible by 3, 4, 6 and 8 is:
RRB NTPC 18/01/2021 (Morning)
(a) 23 (b) 24 (c) 22 (d) 21

Q.198. The L.C.M of two consecutive positive integers x and x + 1 is:
RRB NTPC 18/01/2021 (Evening)
(a) x (b) x(x + 1) (c) 1 (d) x + 1

Q.199. If LCM and HCF of two numbers are 70 and 7 respectively and if one number is 35, then what will be the second number?
RRB NTPC 18/01/2021 (Evening)
(a) 40 (b) 25 (c) 49 (d) 14

Q.200. The LCM of two numbers is the 20th multiple of 3. If their HCF is 6 and one of the number is 12, then the second number is.
RRB NTPC 19/01/2021 (Morning)
(a) 24 (b) 42 (c) 30 (d) 56

Q.201. The HCF and LCM of two numbers are 6 and 36 respectively. If one of the number is 12, then the other number is:
RRB NTPC 19/01/2021 (Morning)
(a) 36 (b) 18 (c) 14 (d) 16

Q.202. A physical education teacher has to distribute 96 bats and 180 balls among a number of players, such that all players get the same number of bats and likewise, all players get the same number of balls. What will be the greatest number of players receiving the gift?
RRB NTPC 20/01/2021 (Morning)
(a) 4 (b) 12 (c) 6 (d) 16

Q.203. The HCF of 24 and 144 is ' 10p + 4' , then the value of p is:
RRB NTPC 20/01/2021 (Evening)
(a) 1 (b) 4 (c) 2 (d) 3

Q.204. The LCM of two numbers is 721, and the numbers are in the ratio of 1 : 7. What is the sum of the numbers?
RRB NTPC 21/01/2021 (Morning)
(a) 824 (b) 721 (c) 728 (d) 825

Q.205. What is the LCM of $\sqrt[2]{169}$, $\sqrt[3]{27}$, $\sqrt[3]{64}$ and $\sqrt[2]{144}$?
RRB NTPC 21/01/2021 (Morning)
(a) 468 (b) 156 (c) 321 (d) 182

Q.206. LCM of two numbers is 78. Their GCD is 13. If one of the numbers is 26, then the other number is...
RRB NTPC 21/01/2021 (Evening)
(a) 39 (b) 46 (c) 13 (d) 52

Q.207. If the HCF of 85 and 153 is expressible in the form of 85x - 153, then the value of x is:
RRB NTPC 22/01/2021 (Morning)
(a) 3 (b) 5 (c) 1 (d) 2

Q.208. The LCM of 63, 36 and x is 252, Which of the following options can not be the value of x?
RRB NTPC 22/01/2021 (Evening)
(a) 28 (b) 42 (c) 14 (d) 56

Q.209. Find the smallest number that is exactly divisible by 7, 14, 28, 35 and 42.
RRB NTPC 23/01/2021 (Morning)
(a) 450 (b) 430 (c) 410 (d) 420

Q.210. Two numbers are in the ratio of 2 : 3 and the product of their LCM and HCF is 9600. The sum of the number is:
RRB NTPC 23/01/2021 (Morning)
(a) 250 (b) 150 (c) 200 (d) 100

Q.211. The product of two co-prime numbers is 119. Their LCM should be:
RRB NTPC 23/01/2021 (Morning)
(a) 119 (b) 1 (c) 7 (d) 17

Q.212. What is the greatest number that will divide 2400 and 1810 and leave remainders 6 and 4 respectively?
RRB NTPC 25/01/2021 (Morning)
(a) 42 (b) 44 (c) 46 (d) 40

Q.213. Find the least number which when divided by 8,12 and 16, leaves three as the remainder in each case but when divided by 7 leaves no remainder.
RRB NTPC 25/01/2021 (Morning)
(a) 266 (b) 248 (c) 147 (d) 149

Q.214. What least number must be subtracted from 1391 so that the remainder when divided by 7, 9, 11 will leave in each case the same remainder 3?
RRB NTPC 25/01/2021 (Morning)
(a) 1 (b) 3 (c) 2 (d) 4

Q.215. Find the least number which, when added to 3496, is completely divisible by the numbers 2,6,4 and 3?
RRB NTPC 25/01/2021 (Evening)
(a) 15 (b) 11 (c) 4 (d) 8

Q.216. The ratio of two numbers is 5 : 6 and their HCF is 6. Their LCM is :
RRB NTPC 27/01/2021 (Morning)
(a) 120 (b) 66 (c) 180 (d)140

Q.217. The HCF and LCM of two numbers are 44 and 264, respectively. If the first number is divided by 2, then the quotient is 44. What is the second number?
RRB NTPC 27/01/2021 (Evening)
(a) 134 (b) 132 (c) 130 (d) 136

Q.218. Find the smallest number which when diminished by 3 is divisible by 21, 24, 30 and 35.
RRB NTPC 28/01/2021(Morning)
(a) 883 (b) 860 (c) 843 (d) 980

Q.219. Find the greatest number, which when divides 76, 151 and 226 leaves same remainder.
RRB NTPC 28/01/2021(Morning)
(a) 75 (b) 78 (c) 70 (d) 76

Q.220. What is the least number which when increased by 7 is divisible by 16, 18, 24 and 28?
RRB NTPC 28/01/2021 (Evening)
(a) 1006 (b) 1008 (c) 1001 (d) 9999

Q.221. Five bells begin to toll together and toll at intervals of 4, 6, 7, 8 and 12 seconds, respectively. After how many seconds, will they toll together again?
RRB NTPC 28/01/2021 (Evening)
(a) 170 (b) 172 (c) 166 (d) 168

Q.222. The HCF of two numbers is 11 and their LCM is 330. If one of the numbers is 55, then find the other number.
RRB NTPC 29/01/2021 (Morning)
(a) 66 (b) 77 (c) 88 (d) 99

Q.223. Find the greatest number that divides 128, 303 and 247, leaving remainders 4, 7 and 19, respectively.
RRB NTPC 29/01/2021 (Evening)
(a) 4 (b) 6 (c) 7 (d) 5

Q.224. If the LCM of a and b is c, then their HCF is:
RRB NTPC 29/01/2021 (Evening)
(a) $\frac{bc}{a}$ (b) $\frac{ab}{c}$ (c) $\frac{ac}{b}$ (d) $\frac{c}{ab}$

Q.225. What least number should be added to 3500 to make it exactly divisible by 42, 49, 56 and 63?
RRB NTPC 30/01/2021 (Morning)
(a) 28 (b) 26 (c) 22 (d) 24

Q.226. The sum of the two numbers is 850 and their HCF is 25. A possible pair of such numbers is?
RRB NTPC 30/01/2021 (Evening)
(a) 225, 625 (b) 300, 550
(c) 350, 500 (d) 250, 600

Q.227. If $\frac{288}{x}$ and $\frac{108}{x}$ are natural numbers, then what is the maximum value of x?
RRB NTPC 31/01/2021 (Morning)
(a) 42 (b) 54 (c) 48 (d) 36

Q.228. The HCF of two even numbers should be at least _____.
RRB NTPC 31/01/2021 (Evening)
(a) 0 (b) 1 (c) 4 (d) 2

Q.229. HCF and LCM of two numbers are 5 and 210 respectively, If the numbers are between 25 and 40, the sum of the numbers will be:
RRB NTPC 31/01/2021 (Evening)
(a) 55 (b) 60 (c) 65 (d) 50

Q.230. The sum of two numbers is 66 and their HCF and LCM are 3 and 315 respectively. The sum of the reciprocals of the numbers will be:
RRB NTPC 31/01/2021 (Evening)
(a) $\frac{56}{315}$ (b) $\frac{22}{315}$ (c) $\frac{66}{315}$ (d) $\frac{3}{315}$

Q.231. A, B and C begin together to move around in a circular stadium and they complete their revolution in 42 s, 63s, and 84 s respectively. After how much time they come together at the starting point?
RRB NTPC 02/02/2021 (Morning)
(a) 152 s (b) 452 s (c) 252 s (d) 256 s

Q.232. What is the greatest number which divides 13, 26 and 39 and gives the remainders as 1, 2 and 3 respectively?
RRB NTPC 02/02/2021 (Evening)
(a) 4 (b) 6 (c) 12 (d) 2

Q.233. The LCM of x and y is 2079 and their HCF is 27, If x = 189, what will be the value of y?
RRB NTPC 02/02/2021 (Evening)
(a) 167 (b) 197 (c) 267 (d) 297

Q.234. The LCM of $\sqrt{36}$ and $\sqrt{64}$ is:
RRB NTPC 03/02/2021 (Morning)
(a) 640 (b) 72 (c) 360 (d) 24

Q.235. The least number which on being divided by 2,3,4,5 and 6 leaves a remainder of 1 but no remainder when divided by 7 is:
RRB NTPC 03/02/2021 (Evening)
(a) 322 (b) 315 (c) 308 (d) 301

Q.236. The sum of two numbers is 72.Their HCF and LCM are 2 and 102, respectively. The sum of the reciprocals of the same two numbers is:
RRB NTPC 04/02/2021 (Morning)
(a) $\frac{5}{17}$ (b) $\frac{6}{17}$ (c) $\frac{7}{19}$ (d) $\frac{8}{19}$

Q.237. The HCF and LCM of two numbers are 60 and 420, respectively. If the first number is divided by 2. Then the quotient is 60 . The second number is.
RRB NTPC 04/02/2021 (Morning)
(a) 150 (b) 190 (c) 170 (d) 210

Q.238. 18 apple trees, 21 mango trees and 39 orange trees have to be planted in rows such that each row contains the same number of trees and all of the same variety only. The minimum number of rows in which the trees may be planted is:
RRB NTPC 08/02/2021 (Morning)
(a) 26 (b) 28 (c) 24 (d) 22

Q.239. The product of the LCM and HCF of two positive numbers is 72. The difference of these two numbers is 1. Find the numbers.
RRB NTPC 08/02/2021 (Morning)
(a) 6 and 8 (b) 8 and 7
(c) 9 and 7 (d) 8 and 9

Q.240. The HCF and LCM of two numbers are 75 and 450 respectively. If the first number is divided by 3, the quotient is 75. The second number is:
RRB NTPC 08/02/2021 (Morning)
(a) 225 (b) 75 (c) 450 (d) 150

Q.241. How many of the first 100 positive integers are divisible by 3 or 4 without a remainder?
RRB NTPC 08/02/2021 (Evening)
(a) 58 (b) 85 (c) 5 (d) 50

Q.242. The largest number of four digits that is divisible by 12,15 and 18 is:
RRB NTPC 08/02/2021 (Evening)
(a) 9000 (b) 9750 (c) 9450 (d) 9900

Q.243. The LCM of two numbers is 96 and their HCF is 8. If one of the two numbers is 32, then what is the other number?
RRB NTPC 08/02/2021 (Evening)
(a) 28 (b) 16 (c) 48 (d) 24

Q.244. The product of the LCM and HCF of two positive numbers is 36. The difference of the two numbers is 5. Find the numbers.
RRB NTPC 09/02/2021 (Evening)
(a) 5 and 8 (b) 5 and 9
(c) 4 and 9 (d) 4 and 8

Q.245. The LCM of two numbers is 26 times their HCF. The sum of the HCF and LCM is 729. If one number is 81. Find the other.
RRB NTPC 09/02/2021 (Evening)
(a) 233 (b) 232 (c) 234 (d) 231

Q.246. The HCF of two numbers is 29 and the other two factors of their LCM are 13 and 17. The smallest of the two numbers is:
RRB NTPC 09/02/2021 (Evening)
(a) 493 (b) 373 (c) 377 (d) 387

Q.247. The LCM of two co-prime numbers is 638. If one number is 29, then the other number is.
RRB NTPC 11/02/2021 (Morning)
(a) 32 (b) 22 (c) 11 (d) 13

Q.248. Three whole cakes weigh $4\frac{1}{2}$ lbs, $6\frac{3}{4}$lbs and $7\frac{1}{5}$lbs, respectively. Each cake has to be divided into pieces of equal weight. Each piece must be as heavy as possible. If one such piece is served to each guest, then what are the maximum number of guests that can be served?
RRB NTPC 11/02/2021 (Morning)
(a) 54 (b) 72 (c) 45 (d) 41

Q.249. What is the greatest number that will divide 38, 45, 52 and leave as remainders 2, 3, and 4 respectively?
RRB NTPC 11/02/2021 (Evening)
(a) 6 (b) 7 (c) 9 (d) 5

Q.250. The LCM of 248 and 868 is 1736. What is the HCF?
RRB NTPC 12/02/2021 (Morning)
(a) 248 (b) 1736 (c) 868 (d) 124

Q.251. The HCF of two numbers is 20 and their LCM is 400. If one of the numbers is 80, then the other number is:
RRB NTPC 15/02/2021 (Morning)
(a) 150 (b) 120 (c) 100 (d) 80

Q.252. Calculate the least perfect square. which is exactly divisible by each of 2, 5, 7, 8 and 10
RRB NTPC 15/02/2021 (Evening)
(a) 19000 (b) 18600 (c) 19200 (d) 19600

Q.253. Calculate the greatest possible length which can be used to measure exactly the length 220cm, 260 cm and 300cm.
RRB NTPC 15/02/2021 (Evening)
(a) 20 cm (b) 15 cm (c) 10 cm (d) 25 cm

Q.254. Find the least number which when divided by 5 leaves no remainder, when divided by 4 leaves a remainder of 1 but when divided by 6 or 7 leaves a remainder of 5.
RRB NTPC 15/02/2021 (Evening)
(a) 400 (b) 450 (c) 425 (d) 430

Q.255. The sum of two numbers is 60, and their difference is $\frac{1}{6}$ of their sum. Their LCM is:
RRB NTPC 16/02/2021 (Morning)
(a) 175 (b) 100 (c) 200 (d) 150

Q.256. A pendulum strikes 2 times in 3 sec, and another pendulum strikes 5 times in 7 sec. If both pendulums start striking at the same time, how many simultaneous strikes will take place in 1 min?
RRB NTPC 16/02/2021 (Evening)
(a) 4 (b) 2 (c) 5 (d) 3

Q.257. If the product of two co-primes is 104, then their LCM:
RRB NTPC 17/02/2021 (Morning)
(a) 104 (b) can't be determined
(c) 1 (d) is equal to their HCF

Q.258. The product of the LCM and the HCF of two positive numbers is 32 and the difference of the numbers is 4. The sum of the same numbers is.
RRB NTPC 17/02/2021 (Morning)
(a) 10 (b) 12 (c) 16 (d) 14

Q.259. The LCM of two prime numbers, a and b (a > b > 1), is 697. The value of a - 2b is.
RRB NTPC 17/02/2021 (Morning)
(a) 7 (b) 8 (c) 6 (d) 5

Q.260. Three positive numbers are in the ratio of 1 : 2 : 5 and their LCM is 120. The HCF of the same numbers is:
RRB NTPC 17/02/2021 (Morning)
(a) 14 (b) 10 (c) 12 (d) 16

Q.261. The LCM of 6, 9 and x is 72. Which of the given options can be a possible value of x?
RRB NTPC 17/02/2021 (Evening)
(a) 24 (b) 12 (c) 36 (d) 18

Q.262. What is the HCF of n and n + 1 where n is a natural number?
RRB NTPC 22/02/2021 (Morning)
(a) 3 (b) 2 (c) 0 (d) 1

Q.263. The sum of two numbers is 98 and their HCF is 14. How many such pairs can be formed?
RRB NTPC 22/02/2021 (Evening)
(a) 1 (b) 4 (c) 3 (d) 2

Q.264. Which of the following statements is true?
RRB NTPC 22/02/2021 (Evening)
(a) HCF of fractions = LCM of numerators / HCF of denominators
(b) LCM of fractions = HCF of numerators / LCM of denominators
(c) HCF of fractions = HCF of numerators / LCM of denominators
(d) The numbers are said to be co-prime if their LCM is 1

Q.265. The HCF of two numbers is 30 and LCM is 2310. If one of the numbers is 210. Other number is:
RRB NTPC 27/02/2021 (Morning)
(a) 220 (b) 330 (c) 440 (d) 550

Q.266. The LCM of 4, 6 and x can not be
RRB NTPC 27/02/2021 (Morning)
(a) 24 (b) 36 (c) 18 (d) 60

Q.267. Six bells commence tolling together and toll at the intervals of 2, 4, 6, 8, 10 and 12 seconds respectively. In the first 10 minutes, how many times would they have tolled together?
RRB NTPC 27/02/2021 (Evening)
(a) 5 times (b) 4 times
(c) 2 times (d) 6 times

Q.268. Find the least positive number; which when divided by 5,6,8,9 and 12, gives 1 as a remainder in each case and is completely divisible by 13.
RRB NTPC 01/03/2021 (Morning)
(a) 3601 (b) 3627 (c) 3640 (d) 3614

Q.269. Which largest number will divide 627 and 233 leaving remainders of 11 and 13 respectively?
RRB NTPC 01/03/2021 (Evening)
(a) 22 (b) 23 (c) 44 (d) 33

Q.270. Two positive numbers are in the ratio 7 : 9 and the product of their LCM and HCF is 25200, The sum of the numbers is:
RRB NTPC 02/03/2021 (Morning)
(a) 320 (b) 400 (c) 256 (d) 140

Q.271. A gardener wants to plant trees in a garden in rows. If the number of trees in each row is the same, and there are 105 or 210 or 420 rows, then no tree will be left. Find the least number of trees that can be planted.
RRB NTPC 02/03/2021 (Morning)
(a) 315 (b) 420 (c) 210 (d) 105

Q.272. The product of the LCM and HCF of two numbers is 24. The difference between the two numbers is 2. Find the numbers.
RRB NTPC 02/03/2021 (Evening)
(a) 8 and 10 (b) 2 and 4
(c) 4 and 6 (d) 8 and 6

Q.273. Find the number which when subtracted from 5824, gives a number exactly divisible by each of 20, 28, 36 and 48.
RRB NTPC 02/03/2021 (Evening)
(a) 780 (b) 786 (c) 784 (d) 782

Q.274. If the HCF and LCM of two numbers are 8 and 160 respectively, then the sum of the numbers is:
RRB NTPC 03/03/2021 (Morning)
(a) 72 (b) 80 (c) 74 (d) 70

Q.275. The measure of the greatest length which can measure 24 m, 32 m and 42 m completely is:
RRB NTPC 04/03/2021 (Morning)
(a) 4 m (b) 2 m (c) 5 m (d) 8 m

Q.276. The sum of two numbers is 434 and their H.C.F is 31 . How many pairs of numbers can satisfy the above conditions?
RRB NTPC 04/03/2021 (Morning)
(a) 3 (b) 4 (c) 6 (d) 5

Q.277. Find the smallest number that should be added to 166, so that the sum leaves a remainder of 3 on dividing by each of 4,6,9 and 15.
RRB NTPC 04/03/2021 (Evening)
(a) 13 (b) 16 (c) 17 (d) 163

Q.278. What is the ratio of the L.C.M. and H.C.F. of the numbers 56 and 84?
RRB NTPC 04/03/2021 (Evening)
(a) 2 : 3 (b) 7 : 2 (c) 6 : 1 (d) 3 : 2

Q.279. The HCF of two numbers is 4 and their product is 48. Find the numbers.
RRB NTPC 05/03/2021 (Morning)
(a) 4, 24 (b) 12,16 (c) 4,12 (d) 4,8

Q.280. The ratio of two numbers is 3 : 4 and their LCM is 180. What is the larger of the two numbers?
RRB NTPC 07/03/2021 (Morning)
(a) 15 (b) 20 (c) 60 (d) 45

Q.281. The LCM of two numbers is 126 and their HCF is 2. If one number is 18 then the other is:
RRB NTPC 07/03/2021 (Evening)
(a) 14 (b) 12 (c) 16 (d) 9

Q.282. The least square number that is exactly divisible by 4,5,8,16 and 32 is:
RRB NTPC 07/03/2021 (Evening)
(a) 1600 (b) 400 (c) 3600 (d) 900

Q.283. The least number that when divided by 9,16,20 or 24, leaves 3 as remainder in each case is:
RRB NTPC 07/03/2021 (Evening)
(a) 725 (b) 720 (c) 723 (d) 717

Q.284. Find the least number that on being divided by 5, 6, 8, 9 and 12 leaves 4 as the remainder in each case.
RRB NTPC 08/03/2021 (Morning)
(a) 364 (b) 360 (c) 366 (d) 368

Q.285. The sum of the digits of the smallest number which, when divided by 18,21,25 and 39 leaves a remainder of 3 in each case is:
RRB NTPC 08/03/2021 (Evening)
(a) 21 (b) 18 (c) 39 (d) 25

Q.286. The product of the LCM and HCF of two positive numbers is 28 and their difference is 3. The numbers are:
RRB NTPC 08/03/2021 (Evening)
(a) 7 and 5 (b) 3 and 5
(c) 4 and 7 (d) 5 and 6

Q.287. Calculate the LCM of 22,34 and 40.
RRB NTPC 11/03/2021 (Morning)
(a) 7260 (b) 7840 (c) 7480 (d) 7420

Q.288. Calculate the HCF of
$\frac{2}{3}, \frac{8}{9}, \frac{16}{81}, \frac{10}{27}$
RRB NTPC 11/03/2021 (Morning)
(a) $\frac{5}{81}$ (b) $\frac{3}{81}$ (c) $\frac{4}{81}$ (d) $\frac{2}{81}$

Q.289. Find the least number which is required to be added to 2495 so that the sum is exactly divisible by 3,4,5 and 6.
RRB NTPC 11/03/2021 (Morning)
(a) 33 (b) 13 (c) 25 (d) 23

Q.290. Find the greatest number of five digits that is divisible by 15, 21 and 35.
RRB NTPC 12/03/2021 (Morning)
(a) 99940 (b) 99950 (c) 99980 (d) 99960

Q.291. Three containers contain 204, 136 and 119 liters of water respectively. Find the maximum capacity of a small container that can measure the water of each big container an exact number of times.
RRB NTPC 12/03/2021 (Morning)
(a) 18 litres (b) 17 liters
(c) 15 liters (d) 19 liters

Q.292. If 24 is the LCM of two numbers and the numbers are in the ratio of 1 : 2 , then the product of the two numbers is:
RRB NTPC 12/03/2021 (Evening)
(a) 820 (b) 300 (c) 280 (d) 288

Q.293. Find the least number, which gives the same remainder 5. When divided by 6,10,15 and 24.
RRB NTPC 12/03/2021 (Evening)
(a)120 (b) 215 (c) 125 (d) 521

Q.294. The greatest number, which will divide 39 and 84 to leave remainder 3 in each case, is.
RRB NTPC 13/03/2021 (Morning)
(a) 9 (b) 4 (c) 2 (d) 6

Q.295. The HCF of two numbers is 37 and their LCM is 740. If one of the numbers is 148, then the other is:
RRB NTPC 13/03/2021 (Morning)
(a) 180 (b) 190 (c) 185 (d) 195

Q.296. The least number which when divided by 9,16,20 or 24 leaves 3 as remainder in each case is:
RRB NTPC 13/03/2021 (Evening)
(a) 717 (b) 720 (c) 723 (d) 725

Q.297. The least square number that is exactly divisible by 4, 5, 8, 16 and 32 is:
RRB NTPC 13/03/2021 (Evening)
(a) 1600 (b) 900 (c) 3600 (d) 400

Q.298. The ratio of two numbers is 3:5 and their LCM is 105. What is the difference between the numbers?
RRB NTPC 14/03/2021 (Morning)
(a) 10 (b) 4 (c) 14 (d) 7

Q.299. The LCM of two prime numbers x and y (x > y) is 319. The value of 2x - 5y is.
RRB NTPC 14/03/2021 (Evening)
(a) 4 (b) 2 (c) 1 (d) 3

Q.300. Find the second term in a sequence of numbers that leaves the remainder 1,2 and 7 when divided by 2,3 and 8 respectively.
RRB NTPC 15/03/2021 (Morning)
(a) 48 (b) 38 (c) 47 (d) 37

Q.301. A shopkeeper has 25 liters of oil in one can and 45 liters in another can. The maximum capacity (in liters) of a container that can measure the oil of either container an exact number of times is:
RRB NTPC 19/03/2021 (Morning)
(a) 1 (b) 5 (c). 9 (d) 3

Q.302. The LCM and HCF of two numbers are 2400 and 20 respectively. When we divide the first number by 8, the quotient is 60. Then the second number is:
RRB NTPC 19/03/2021 (Evening)
(a) 300 (b) 600 (c) 400 (d) 100

Q.303. What is the least multiple of 7, which when divided by 2,3,4,5 and 6 leaves the remainders 1,2,3,4 and 5 respectively?
RRB NTPC 21/03/2021 (Evening)
(a) 133 (b) 119 (c) 140 (d) 147

Q.304. What is the least number which is a perfect square and contains 3675 as its factor?
RRB NTPC 27/03/2021 (Morning)
(a) 11025 (b) 11055 (c) 11045 (d) 11035

Q.305. The least perfect square number completely divisible by 4,5,9 and 12 is:
RRB NTPC 27/03/2021 (Evening)
(a) 900 (b) 400 (c) 3600 (d) 2500

Q.306. The least number, which when divided by 18,30,40 and 45 leaves in each case a remainder of 7, is:
RRB NTPC 27/03/2021 (Evening)
(a) 367 (b) 361 (c) 353 (d) 360

Q.307. LCM of 30, 40 and 45 is:
RRB NTPC 01/04/2021 (Morning)
(a) 115 (b) 54000 (c) 5 (d) 360

Q.308. If the HCF and LCM of 12 and x is 3 and 60 respectively, then x is _____.
RRB NTPC 01/04/2021 (Evening)
(a) 5 (b) 15 (c) 3 (d) 60

Q.309. The LCM of two natural numbers is 1326 and their HCF is 3. If the difference of the numbers is 27, then the sum of the numbers is _____.
RRB NTPC 01/04/2021 (Evening)
(a) 140 (b) 117 (c) 129 (d) 125

Q.310. The LCM of two numbers is 315 and their HCF is 21, and the difference of the numbers is 42. The sum of the numbers is _____.
RRB NTPC 03/04/2021 (Morning)
(a) 83 (b) 168 (c) 105 (d) 63

Q.311. The LCM and HCF of two numbers are 60 and 3, respectively . If the first number is 12, then the second number is:
RRB NTPC 05/04/2021 (Morning)
(a) 20 (b) 25 (c) 15 (d) 10

Q.312. The product of two numbers is 270. If their LCM is 90, then their HCF is:
RRB NTPC 05/04/2021 (Morning)
(a) 2 (b) 4 (c) 5 (d) 3

Q.313. What is the least number, which, when divided by 45 and 55 leaves a remainder of 3 in each case?
RRB NTPC 06/04/2021 (Morning)
(a) 625 (b) 498 (c) 825 (d) 2475

Q.314. The ratio of the HCF to the LCM of the numbers $\sqrt{64}$ and 16 is:
RRB NTPC 06/04/2021 (Morning)
(a) 1 : 2 (b) 1 : 4 (c) 1 : 1 (d) 2 : 1

Q.315. The HCF of 15, 25 and 42 is:
RRB NTPC 06/04/2021 (Evening)
(a) 27 (b) 82 (c) 1050 (d) 1

Q.316. Find the smallest number , which when divided by 35,40 and 60 leaves a remainder 7 in each case.
RRB NTPC 07/04/2021 (Morning)
(a) 893 (b) 800 (c) 847 (d) 814

Q.317. The LCM of 248 and 868 is 1736. The HCF of the same two numbers is:
RRB NTPC 07/04/2021 (Morning)
(a) 124 (b) 248 (c) 868 (d) 1736

Q.318. Three pieces of aluminum rod of different lengths, 44 cm, 22 cm and 55 cm respectively, are given to a boy. He has to cut them into rods of same length such that no aluminum waste is left. The maximum length (in cm) of such rod will be:
RRB NTPC 07/04/2021 (Evening)
(a) 16.5 cm (b) 22 cm
(c) 5.5 cm (d) 11 cm

Q.319. The greatest number that divides 155 and 307 leaving remainders 5 and 7, respectively , is:
RRB NTPC 07/04/2021 (Evening)
(a) 25 (b) 30 (c) 150 (d) 15

Q.320. Find the least number that when divided by 9, 8, 10 and 12 leaves a remainder of 3 in each case.
RRB NTPC 08/04/2021 (Morning)
(a) 361 (b) 365 (c) 363 (d) 367

Q.321. The sum and difference of the LCM and HCF of two numbers are 682 and 638 respectively. If the sum of the two numbers is 286, find the numbers.
RRB NTPC 08/04/2021 (Morning)
(a) 246 and 40 (b) 220 and 66
(c) 226 and 60 (d) 242 and 44

Q.322. Two numbers are in the ratio of 3:2 and their LCM is 96. Find the numbers.
RRB NTPC 08/04/2021 (Morning)
(a) 47 and 32 (b) 46 and 32
(c) 48 and 32 (d) 46 and 31

Q.323. 391 boys and 323 girls are distributed in groups in such a manner that each group has equal number of members and that the groups have either only boys or only girls. What is the minimum number of groups?
RRB NTPC 08/04/2021 (Evening)
(a) 17 (b) 42 (c) 23 (d) 19

Q.324. The ratio of two numbers is 3 : 7 and their HCF is 3. Their LCM is:
RRB NTPC 23/07/2021 (Morning)
(a) 3 (b) 36 (c) 7 (d) 63

Q.325. If the HCF of two numbers is 18 and their LCM is 378, then which of the following is a possible pair of such numbers?
RRB NTPC 23/07/2021 (Evening)
(a) 54, 252 (b) 54, 126
(c) 27, 252 (d) 18, 252

Q.326. If x + y = 40 and x - y = 20, then the HCF of x and y is:
RRB NTPC 24/07/2021 (Morning)
(a) 30 (b) 40 (c) 20 (d) 10

Q.327. Find the HCF of the first 100 natural numbers.
RRB NTPC 24/07/2021 (Evening)
(a) 1 (b) 10 (c) 2 (d) 100

Q.328. The GCD of two numbers is 9 and their LCM is 270. If one number is 27, then what will be the second number?
RRB NTPC 24/07/2021 (Evening)
(a) 900 (b) 10 (c) 54 (d) 90

Q.329. The smallest number that can be divided exactly by 16, 18, 27, and 45 is:
RRB NTPC 26/07/2021 (Morning)
(a) 1060 (b) 2160 (c) 1540 (d) 1640

Q.330. The product of two numbers is 259200 and their LCM is 4320. The HCF of the same two numbers is:
RRB NTPC 26/07/2021 (Morning)
(a) 60 (b) 45 (c) 65 (d) 58

Q.331. Find the LCM of two numbers, if their HCF is 2 and product is 120.
RRB NTPC 26/07/2021 (Evening)
(a) 120 (b) 30 (c) 90 (d) 60

Q.332. The LCM of two numbers is 1024,

and one of them is a prime number. Find their GCD.
RRB NTPC 31/07/2021 (Morning)
(a) 5 (b) 7 (c) 2 (d) 3

Q.333. What is the least number that when divided by 18 and 24 leaves a remainder of 11 and 17, respectively?
RRB NTPC 31/07/2021 (Morning)
(a) 72 (b) 65 (c) 79 (d) 24

Q.334. Find the least number which when divided by 20,25,35 and 40 leaves remainders 15,20,30 and 35 respectively.
RRB NTPC 31/07/2021 (Evening)
(a) 1240 (b) 1860 (c) 1395 (d) 7265

RRB JE (22/05/2019 to 28/06/2019)

Q.335. What are the LCM and HCF of the reciprocals of 18 and 24?
RRB JE 22/05/2019 (Afternoon)
(a) $\frac{1}{72}, \frac{1}{6}$ (b) $\frac{1}{6}, \frac{1}{4}$
(c) 72 , 6 (d) $\frac{1}{6}, \frac{1}{72}$

Q.336. Product of two coprime numbers is 903. Find their LCM.
RRB JE 22/05/2019 (Afternoon)
(a) 301 (b) Cannot be determined
(c) 39 (d) 903

Q.337. The LCM of two numbers which are in the ratio 2 : 3 is 48. What is their sum?
RRB JE 22/05/2019 (Evening)
(a) 32 (b) 28 (c) 64 (d) 40

Q.338. Two numbers are in the ratio 4 : 5. Their LCM is 180. What is their sum?
RRB JE 24/05/2019 (Evening)
(a) 81 (b) 72 (c) 90 (d) 70

Q.339. Find the least number which when divided by 5, 6, 7, 8, leaves a remainder 3, and is also a multiple of 9.
RRB JE 26/05/2019 (Afternoon)
(a) 1983 (b) 1677 (c) 1683 (d) 843

Q.340. There are three cans of milk containing 36 litres, 45 litres and 72 litres. Find the biggest measure that can measure all these exactly.
RRB JE 28/05/2019 (Morning)
(a) 7 litres (b) 8 litres
(c) 9 litres (d) 15 litres

Q.341. Find the maximum number of children among whom 429 pencils and 715 pens can be equally distributed.
RRB JE 28/05/2019 (Afternoon)
(a) 120 (b) 100 (c) 160 (d) 143

Q.342. If A, B are two natural numbers >1 and their H.C.F is 1, then which of these statements is always TRUE?
RRB JE 31/05/2019 (Evening)
(a) A, B are coprime to each other
(b) A, B are both prime numbers
(c) Product AB is a prime number
(d) A, B are even consecutive numbers

Q.343. Two numbers are in the ratio 1 : 4 and their LCM and HCF are 84 and 21. Find the smaller number.
RRB JE 01/06/2019 (Morning)
(a) 108 (b) 21 (c) 18 (d) 84

Q.344. Find the Greatest number that will exactly divide 25, 35, 40,and 30.
RRB JE 01/06/2019 (Afternoon)
(a) 35 (b) 15 (c) 20 (d) 5

Q.345. The sum of LCM and HCF of two numbers is 372. If LCM is equal to 92 times of HCF and one of the numbers is 368, what is the other number?
RRB JE 01/06/2019 (Evening)
(a) 4 (b) 360 (c) 92 (d) 96

Q.346. A father is aged twice more than his son. The HCF of their ages is 22. What is the son's age?
RRB JE 02/06/2019 (Morning)
(a) 18 years (b) 24 years
(c) 22 years (d) 20 years

Q.347. Find the least multiple of 7 that leaves the remainder 4 when divided by 6, 9, 15 and 18.
RRB JE 02/06/2019 (Morning)
(a) 94 (b) 274 (c) 184 (d) 364

Q.348. Two numbers in the ratio 15 : 11 have their HCF to be 13. What is their LCM?
RRB JE 02/06/2019 (Evening)
(a) 2145 (b) 165 (c) 4290 (d) 27885

Q.349. The sum of two numbers is 232. Their HCF is 29. Which of these pairs give the possible values of the numbers ?
RRB JE 02/06/2019 (Evening)
(a) 55, 177 (b) 29, 203
(c) 58, 174 (d) 22, 137

Q.350. Find the greatest number which on dividing 1657 and 2037 leaves remainders 6 and 5 respectively.
RRB JE 26/06/2019 (Morning)
(a) 132 (b) 124 (c) 114 (d) 127

Q.351. Two numbers have their HCF and LCM to be 72 and 1008 respectively. If one of the numbers is 144, then find the other number.
RRB JE 26/06/2019 (Morning)
(a) 252 (b) 504 (c) 202 (d) 404

Q.352. Find the LCM and HCF of a(a + b) and b(a + b), where a, b are coprime.
RRB JE 26/06/2019 (Morning)
(a) ab(a + b), (a + b) (b) (a + b), 1
(c) ab, (a + b) (d) ab(a + b), ab

Q.353. Find the LCM of set of prime numbers a, b and c.
RRB JE 26/06/2019 (Evening)
(a) abc (b) $\frac{1}{3}$abc (c) $a^2b^2c^2$ (d) a + b + c

Q.354. Find the largest number of four digits that is exactly divisible by 27, 18, 15 and 12.
RRB JE 26/06/2019 (Evening)
(a) 9730 (b) 9710 (c) 9700 (d) 9720

Q.355. Find the greatest number that will divide the numbers 400, 435 and 541 leaving remainders 9, 10 and 14 respectively.
RRB JE 27/06/2019 (Morning)
(a) 17 (b) 13 (c) 15 (d) 19

Q.356. Find the smallest 3 digit number that is exactly divisible by 12, 15 and 20.
RRB JE 27/06/2019 (Morning)
(a) 115 (b) 240 (c) 180 (d) 120

Q.357. LCM of 36 and K is 72. Find the possible values of 'K'.
RRB JE 27/06/2019 (Evening)
(a) 24 only (b) 8, 24, 72
(c) 24, 72 (d) 8 only

Q.358. Find the HCF of $a^3b^3c^3$, $a^2b^2c^2$, abc and
RRB JE 27/06/2019 (Evening)
(a) $a^4b^4c^4$ (b) $a^3b^3c^3$ (c) $a^2b^2c^2$ (d) abc

Q.359. If two numbers with HCF 9 are in the ratio 5 : 7, what is their difference?
RRB JE 28/06/2019 (Evening)
(a) 24 (b) 8 (c) 18 (d) 12

Q.360. The sum of two numbers is 35. Their product is 150. Find the HCF of the sum of their reciprocals and the difference of the reciprocals.
RRB JE 28/06/2019 (Evening)
(a) $\frac{7}{30}$ (b) $\frac{7}{15}$ (c) $\frac{5}{30}$ (d) $\frac{1}{30}$

RRB ALP Tier - 2 (21/01/2019 to 08/02/2019)

Q.361. Find the LCM of 48 and 54 ?
ALP Tier II 21/01/2019 (Afternoon)
(a) 234 (b) 144 (c) 432 (d) 342

Q.362. The least number consisting of five digits which is divisible by 97 is x. What is the sum of the digits of X?
ALP Tier II 21/01/2019 (Evening)

(a) 13 (b) 15 (c) 17 (d) 16

Q.363. The LCM of two numbers is 48. Their ratio is 2 : 3. Find the sum of the numbers?
ALP Tier II 21/01/2019 (Morning)
(a) 24 (b) 48 (c) 30 (d) 40

Q.364. Find the least common multiple of 56 and 50.
ALP Tier II 23/01/2019 (Afternoon)
(a) 700 (b) 1500 (c) 1400 (d) 800

RPF Constable (17/01/2019 to 19/02/2019)

Q.365. LCM of two numbers 64 and HCF is 16 .If one of them is 64, find the second number.
RPF Constable 17/01/2019 (Evening)
(a) 8 (b) 16 (c) 64 (d) 32

Q.366. LCM of two numbers is 156 and their HCF is 12. Given that one number is 12, find the second number.
RPF Constable 18/01/2019 (Morning)
(a) 132 (b) 13 (c) 156 (d) 12

Q.367. The least common multiple of two numbers is 182 and their highest common factor is 13.If one of the number 13 , then find the second number ?
RPF Constable 19/01/2019 (Morning)
(a) 182 (b) 143 (c) 132 (d) 121

RPF S.I. (19/12/2018 to 16/01/2019)

Q.368. Find the product of numbers whose LCM is 30 and HCF is 9.
RPF S.I. 19/12/2018 (Morning)
(a) 290 (b) 280 (c) 300 (d) 270

Q.369. Find the product of two numbers whose least common factor (LCM) is 45 and greatest common factor (HCF) is 10.
RPF S.I. 19/12/2018 (Evening)
(a) 450 (b) 400 (c) 550 (d) 350

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.370. Tapas, Avi and Rishi shared a cake. Tapas had $\frac{1}{2}$ of it, Rishi had $\frac{1}{3}$ of it and Avi had the rest. What was Avi's share of the cake?
RRB ALP 09/08/2018 (Morning)
(a) $\frac{2}{6}$ (b) $\frac{1}{6}$ (c) $\frac{3}{5}$ (d) $\frac{3}{6}$

Q.371. Find the smallest square number from among the given option which is divisible by each of 8,15 and 20.
RRB ALP 13/08/2018 (Morning)
(a) 6400 (b)14400 (c) 3600 (d) 4900

Q.372. Two numbers are in the ratio of 15 : 11. If their H.C.F is 13. Find the numbers.
RRB ALP 13/08/2018 (Morning)
(a) 195,141 (b) 196,143
(c) 195,143 (d) 195,142

Q.373. A natural number, when divided by 4, 5, 6 or 7, leaves a remainder of 3 in each case. What is the smallest of all such numbers?
RRB ALP 14/08/2018 (Afternoon)
(a) 843 (b) 213 (c) 63 (d) 423

Q.374. Find the least number which when divided by 20, 25, 35 and 40 leaves remainder 14, 19, 29 and 34 respectively?
RRB ALP 14/08/2018 (Evening)
(a)1364 (b)1384 (c)1374 (d)1394

Q.375. The HCF of two numbers is 12 and their LCM is 72. If one of the two numbers is 24, then the other number is:
RRB ALP 21/08/2018 (Afternoon)
(a) 72 (b) 36 (c) 60 (d) 48

Q.376. What is the least number consisting of five digits that is exactly divisible by 12, 18, 20 and 25?
RRB ALP 31/08/2018 (Afternoon)
(a) 10680 (b) 10000
(c) 10800 (d) 11250

Q.377. Three bells ring at intervals of 15, 30 and 45 minutes respectively. At what time will they ring together again, if they rang simultaneously at 8.00 AM?
RRB ALP 31/08/2018 (Evening)
(a) 9.30 AM (b) 9.00 AM
(c) 8.45 AM (d) 8.30 AM

Answer Key :-

1.(c)	2.(b)	3.(b)	4.(a)
5.(b)	6.(b)	7.(a)	8.(b)
9.(d)	10.(a)	11.(a)	12.(c)
13.(b)	14.(a)	15.(b)	16.(b)
17.(d)	18.(a)	19.(d)	20.(d)
21.(b)	22.(a)	23.(d)	24.(a)
25.(b)	26.(c)	27.(b)	28.(c)
29.(b)	30.(c)	31.(d)	32.(b)
33.(b)	34.(a)	35.(d)	36.(d)
37.(a)	38.(c)	39.(a)	40.(b)
41.(d)	42.(c)	43.(d)	44.(d)
45.(d)	46.(a)	47.(a)	48.(c)
49.(d)	50.(c)	51.(d)	52.(c)
53.(a)	54.(d)	55.(c)	56.(d)
57.(b)	58.(b)	59.(c)	60.(a)
61.(a)	62.(b)	63.(a)	64.(a)
65.(c)	66.(d)	67.(d)	68.(d)
69.(c)	70.(b)	71.(a)	72.(c)
73.(d)	74.(b)	75.(b)	76.(b)
77.(d)	78.(b)	79.(a)	80.(c)
81.(d)	82.(a)	83.(c)	84.(a)
85.(b)	86.(b)	87.(a)	88.(d)
89.(d)	90.(c)	91.(c)	92.(a)
93.(c)	94.(c)	95.(c)	96.(d)
97.(c)	98.(d)	99.(d)	100.(c)
101.(d)	102.(b)	103.(c)	104.(c)
105.(d)	106.(b)	107.(d)	108.(a)
109.(d)	110.(c)	111.(d)	112.(b)
113.(d)	114.(a)	115.(c)	116.(d)
117.(b)	118.(b)	119.(b)	120.(d)
121.(a)	122.(a)	123.(c)	124.(c)
125.(b)	126.(c)	127.(a)	128.(b)
129.(a)	130.(a)	131.(b)	132.(a)
133.(c)	134.(d)	135.(b)	136.(c)
137.(c)	138.(c)	139.(d)	140.(d)
141.(c)	142.(b)	143.(d)	144.(d)
145.(a)	146.(b)	147.(a)	148.(a)
149.(b)	150.(d)	151.(a)	152.(b)
153.(b)	154.(b)	155.(b)	156.(b)
157.(d)	158.(d)	159.(c)	160.(a)
161.(c)	162.(b)	163.(d)	164.(a)
165.(c)	166.(a)	167.(b)	168.(b)
169.(c)	170.(b)	171.(d)	172.(d)
173.(d)	174.(a)	175.(c)	176.(a)
177.(b)	178.(d)	179.(d)	180.(c)
181.(d)	182.(d)	183.(c)	184.(a)
185.(c)	186.(d)	187.(a)	188.(a)
189.(c)	190.(c)	191.(c)	192.(d)
193.(c)	194.(b)	195.(d)	196.(c)
197.(c)	198.(b)	199.(d)	200.(c)
201.(b)	202.(b)	203.(c)	204.(a)
205.(b)	206.(a)	207.(d)	208.(d)
209.(d)	210.(c)	211.(a)	212.(a)
213.(c)	214.(c)	215.(d)	216.(c)
217.(b)	218.(c)	219.(a)	220.(c)
221.(d)	222.(a)	223.(a)	224.(b)
225.(a)	226.(a)	227.(d)	228.(d)
229.(c)	230.(b)	231.(c)	232.(c)
233.(d)	234.(d)	235.(d)	236.(b)
237.(d)	238.(a)	239.(d)	240.(d)

241.(d)	242.(d)	243.(d)	244.(c)
245.(c)	246.(c)	247.(b)	248.(d)
249.(a)	250.(d)	251.(c)	252.(d)
253.(a)	254.(c)	255.(a)	256.(b)
257.(a)	258.(b)	259.(a)	260.(c)
261.(a)	262.(d)	263.(c)	264.(c)
265.(b)	266.(c)	267.(d)	268.(a)
269.(c)	270.(a)	271.(b)	272.(c)
273.(c)	274.(a)	275.(b)	276.(a)
277.(c)	278.(c)	279.(c)	280.(c)
281.(a)	282.(a)	283.(c)	284.(a)
285.(a)	286.(c)	287.(c)	288.(d)
289.(c)	290.(d)	291.(b)	292.(d)
293.(c)	294.(a)	295.(c)	296.(c)
297.(a)	298.(c)	299.(d)	300.(c)
301.(b)	302.(d)	303.(b)	304.(a)
305.(a)	306.(a)	307.(d)	308.(b)
309.(c)	310.(b)	311.(c)	312.(d)
313.(b)	314.(a)	315.(d)	316.(c)
317.(a)	318.(d)	319.(c)	320.(c)
321.(b)	322.(c)	323.(b)	324.(d)
325.(b)	326.(d)	327.(a)	328.(d)
329.(b)	330.(a)	331.(d)	332.(c)
333.(b)	334.(c)	335.(d)	336.(d)
337.(d)	338.(a)	339.(c)	340.(c)
341.(d)	342.(a)	343.(b)	344.(d)
345.(a)	346.(c)	347.(d)	348.(a)
349.(b)	350.(d)	351.(b)	352.(a)
353.(a)	354.(d)	355.(a)	356.(d)
357.(b)	358.(d)	359.(c)	360.(d)
361.(c)	362.(c)	363.(d)	364.(c)
365.(b)	366.(c)	367.(a)	368.(d)
369.(a)	370.(b)	371.(c)	372.(c)
373.(d)	374.(d)	375.(b)	376.(c)
377.(a)			

Solutions:-

Sol.1.(c) Factors of 525,735,490 is
5m 25 cm = 525 cm = 5 × 7 × 3 × 5
7m 35 cm = 735 cm = 5 × 3 × 7 × 7
4m 90 cm = 490 cm = 7 × 7 × 5 × 2
Greatest possible length that can be used to measure = HCF of 525,735,490
= 5 × 7 = 35 cm

Sol.2.(b) Check by options
(a) 172, 258 ,here HCF = 86
(b)129,301 here HCF = 43 and sum = 430
(c) 86, 344 here HCF = 86
(d) 215, 215 here HCF = 215
Only option (b) satisfies the conditions

Sol.3.(b) 48 = $2^4 \times 3$ and 72 = $2^3 \times 3^2$
L.C.M (576) = $2^6 \times 3^2$
Possible values of x = $2^6 \times 3^2, 2^6 \times 3, 2^6$
= 576, 192, 64
So the value of x as given in options
= 192.

Sol.4.(a) The H.C.F of any two co-prime numbers always = 1.

Sol.5.(b) 72 - 3 = 69 , 119 - 4 = 115
H.C.F of 69 and 115 = 23

Sol.6.(b) Let the three co-prime numbers be a , b and c.
H.C.F of 357 and 609 = 21
b is common in this two product, b = 21
a = 357 ÷ 21 = 17 and c = 609 ÷ 21 = 29
a + b + c = 17 + 21 + 29 = 67

Sol.7.(a) 9806 - 8954 = 852 ,
11297 - 9806 = 1491
and 11297 - 8954 = 2343

852 1491 2343 852
639 852 1491
213 639

H.C.F of 213 and 639 = 213

Sol.8.(b) Let the numbers are 2x and 3x
H.C.F = x and L.C.M = 84
L.C.M × H.C.F = Product of two numbers
$\Rightarrow 84x = 6x^2 \Rightarrow x = 14$
Sum of the numbers = 2x + 3x
= 28 + 42 = 70

Sol.9.(d) Greatest 5-digit number
= 99999
L.C.M of 18, 15, 21 = 630

630) 99999 (158
-630
3699
-3150
5499
-5040
459

Required number = 99999 - 459 = 99540

Sol.10.(a) $2^3 \times 3^2 \times 5$, $2^2 \times 5^2 \times 7$ and $3^3 \times 5^2 \times 7^2$
L.C.M = $2^3 \times 3^3 \times 5^2 \times 7^2$

Sol.11.(a) L.C.M of 30, 45 , 60
= 180 sec or 3 min
Three lights will red together again , after 3 minutes , 8:30 am + 3 min = 8: 33 am

Sol.12.(c) L.C.M of 12, 16, 18, 21 = 1008
Required number =1008 + 7 = 1015

Sol.13.(b) We know that ,
First number × second number
= LCM × HCF
Now,
27 × n = 54 × 9 so , n = 18

Sol.14.(a) We know that
HCF × LCM = First number × second number
3x × x = 432 (where x is common constant)
$\Rightarrow x^2$ =144 then x = 12
Therefore LCM = 12 × 3 = 36
HCF = 12 × 1 = 12

Sol.15.(b) G.C.D. (108,36) = G.C.D.(x , 72)
36 = G.C.D. (x , 72) x must 36.

Sol.16.(b) x + y = 320
20(a + b) = 320 $\Rightarrow a + b = 16$
Where 'a' and 'b' are co-prime numbers.
There are 4 pairs, x > y ..
(15, 1), (13, 3), (11, 5), (9, 7) .

Sol.17.(d)
$X = Smallest\ prime\ number \times 4 + (L.C.M\ of\ 5, 10) = 2 \times 4 + 10 = 18$
$Y = Smallest\ odd\ prime\ number \times 5 + 2nd\ smallest\ odd\ prime\ number = 3 \times 5 + 5 = 20$
X = 18 and Y = 20
Hence, the difference of Y and X is 2.

Sol.18.(a)
LCM of (12, 18, 21 and 28)= 252
252 × 5 = 1260
1260 + 3 = 1263
Nearest number to 1225, which when divided by 12,18,21 and 28 leaves a remainder of 3 = 1263
Smallest number to be added
= 1263 - 1225 = 38

Sol.19.(d) the common difference between number and remainder

	15	24	32
	-2	-11	-19
common difference→	13	13	13

The LCM of 15, 24 and 32 = 480
Number of marbles = 480 × 5 -13 = 2387
So option (d) is right answer

Sol.20.(d) Let the greater number = x
And the smaller number = y
ATQ,
x - y = 3422 ⇒ X = 3422 + y
And x = 4y + 290
By putting value of x
⇒ 3422 + y = 4y + 290
⇒ 3y = 3422 - 290 ⇒ 3y = 3132
⇒ y = 1044
And x = 3422 + 1044 =4466
Therefore HCF of 4466 and 4292 = 58

Sol.21.(b) H.C.F of 180 and 220 = 20

Hence, The maximum volume of container = 20 litres

Sol.22.(a)
$(X^4 - Y^4)$, $(X^8 - Y^8)$ and $(X^2 - Y^2)$
$\Rightarrow X^4 - Y^4 = (X^2 - Y^2)(X^2 + Y^2)$
$= (X + Y)(X - Y)(X^2 + Y^2)$
$\Rightarrow X^8 - Y^8 = (X^4 - Y^4)(X^4 + Y^4)$
$= (X^2 - Y^2)(X^2 + Y^2)(X^4 + Y^4)$
$= (X + Y)(X - Y)(X^2 + Y^2)(X^4 + Y^4)$
$\Rightarrow X^2 - Y^2 = (X + Y)(X - Y)$
Hence, H.C.F = $(X + Y)(X - Y)$

Sol.23.(d) The highest common factor of any two distinct prime numbers is always1.

Sol.24.(a) A pair of number whose HCF is 1 called the pair of co-prime numbers
HCF of 81 and 16 = 1
therefore , option (a) is the right answer

Sol.25.(b) 1876 - 1 = 1875 ,
12503 - 3 = 12500 and 6877 - 2 = 6875
H.C.F of 1875, 12500 and 6875 = 625
Therefore the greatest no. which divides 1876, 12503 and 6877 leaving 1,3 and 2 respectively is 625

Sol.26.(c) minimum number of plants of each type = L.C.M of (28,42,70) = 420

Sol.27.(b)
H.C.F of (91 - 71) , (71 - 41) , (91 - 41)
H.C.F of 20 , 30, 50 is 10
Now, the L.C.M of 10 and 45 = 90

Sol.28.(c) LCM + HCF = 504 (i) &
LCM - HCF = 456(ii)
Solve eq(i) and eq .(ii) we get, LCM = 480 & HCF = 24
We know that LCM×HCF = 1st number × 2nd number
$\Rightarrow$ 480 × 24 = 96 × 2nd number
$\Rightarrow$ 2nd number = 120

Sol.29.(b) $\frac{5}{6}$, $\frac{6}{5}$ and $\frac{3}{2}$
L.C.M = $\frac{L.C.M\ of\ numerators}{H.C.F\ of\ denominators} = 30$

Sol.30.(c) LCM of 5, 15 and 20 = 60
HCF of 5, 15 and 20 = 5
Ratio of LCM and HCF = 60 : 5 = 12 : 1

Sol.31.(d) LCM of x and y = 286
HCF of x and y = 2
We know,
Product of two numbers = HCF × LCM
xy = 286 × 2 $\Rightarrow$ xy = 572
$\frac{1}{x} + \frac{1}{y} = \frac{x+y}{xy} = \frac{48}{572} = \frac{12}{143}$

Sol.32.(b) $\frac{1}{4}, \frac{2}{3}, \frac{4}{5}, \frac{5}{8}, \frac{3}{4}$
Taking the L.C.M of denominator
[4 ,3 , 5, 8, 4] = 120
$\frac{1}{4} \times 120$, $\frac{2}{3} \times 120$, $\frac{4}{5} \times 120$, $\frac{5}{8} \times 120$, $\frac{3}{4} \times 120$
30 , 80 , 96 , 75 , 90
From the above result we can see that 30 is the smallest and 96 is the largest number.
So, $\frac{1}{4}$ is the smallest number and $\frac{4}{5}$ is the largest number.
So the product of the numbers is ,
$\frac{1}{4} \times \frac{4}{5} = \frac{1}{5}$

Now the value of $(\frac{1}{K} + 4)(\frac{1}{K} - 2)$ = (5 + 4)(5 - 2) = 9 × 3 = 27

Sol.33.(b) Required number
= HCF (360, 520, 280) $\Rightarrow$ 40

Sol.34.(a) x = $2^3 \times 3^2 \times 5 \times 7^3$
y = $2^2 \times 3^3 \times 5^2 \times 7^2$
z = $2^4 \times 3 \times 5^3 \times 7$
HCF = $2^2 \times 3 \times 5 \times 7 = 420$

Sol.35.(d) Grade 6 = 184
Grade 7 = 276
Grade 8 = 322
HCF of 184, 276 and 322 = 46
Minimum number of class teacher
= $\frac{184}{46} + \frac{276}{46} + \frac{322}{46} = 17$

Sol.36.(d) (a - b)(a + 2b), $(a^2 - b^2)$(a + 2b), (a + b)$(a^2 - b^2)$
(a - b) is common in all, hence,
H.C.F is (a - b)

Sol.37.(a) H.C.F of 4230,5986 and 9059 = 439 (that is m)
So, on dividing 4230,5986 and 9059 by 439 we get, 279 (that is n) as remainder.
Now, m - n = 439 - 279 = 160

Sol.38.(c) The LCM of 12, 15 and 18 is = 180, ($2^2 \times 3^2 \times 5$)
The smallest square number which is exactly divisible by 12, 15 and 18 is
= 180 × 5 = 900

Sol.39.(a) HCF of (24, 56, 72) = 8
Total number of trees = 24 + 56 + 72 =152
Number of rows = $\frac{152}{8}$ =19

Sol.40.(b)
HCF = $\frac{HCF\ of\ (2, 4, 8, 10)}{LCM\ of\ (3, 9, 15, 21)} = \frac{2}{315}$

Sol.41.(d)
Numbers are (3^{45} – 1) and (3^{35} – 1)
HCF of 45 and 35 = 5
HCF of (3^{45} – 1) and (3^{35} – 1) = $3^5 - 1$
= 243 - 1 = 242

Sol.42.(c) As we know product of any two numbers = product of LCM and HCF of those two numbers ;
So, the product of LCM and HCF of 18 and 42 = 18 × 42 = 756

Sol.43.(d) The HCF of 51 and 85 is = 17 ;
So, 51m - 85 = 17
51m = 17 + 85 $\Rightarrow$ m = 2

Sol.44.(d) ATQ,
P = a × m × r
Q = b × m × 2 × r (where a, b, m, r are odd primes)
Since HCF is common factor presence in all terms,
So HCF of P and Q will be mr.

Sol.45.(d) The number is divisible by 160 and 12 both.
So the number must be divisible by LCM of 160 and 12.
LCM of 160 and 12 = 480
The required number should be multiple of 480.
$480 \times 3 = 1440$

Sol.46.(a) Let the smaller number = a
And bigger number = b
A/Q, LCM = 3b
And a - HCF = 6 $\Rightarrow$ HCF = a - 6
HCF × LCM = Product of two numbers
$\Rightarrow$ (a - 6) × 3b = ab
$\Rightarrow$ 3a - 18 = a $\Rightarrow$ 2a = 18 $\Rightarrow$ a = 9

Sol.47.(a) LCM of a and b = b
LCM of b and c = c
LCM of a, b, c = c
LCM of c and d = d
So, LCM of a, b, c, and d = d

Sol.48.(c)
Two factors of their LCM are 11 and 13
So the numbers will be
11× HCF and 13× HCF
Larger number = 13 × 19 = 247

Sol.49.(d) Let the numbers be x and y
A/Q, x + y = 84
Product of two numbers = HCF × LCM
$\Rightarrow$ xy = $3 \times 124 = 372$
Now,
$\frac{1}{x} + \frac{1}{y} = \frac{x+y}{xy} = \frac{84}{372} = \frac{7}{31}$

Sol.50.(c) HCF of (403, 434, 465) = 31
The biggest measure required to measure all the different quantities exactly is = 31 litres

Sol.51.(d)
Product of two numbers = $LCM \times HCF$

10^{12} × 2nd number = $10^8 \times 10^{12}7^3$

⇒ 2nd number = $\frac{10^8 \times 10^{12}7^3}{10^{12}} = 10^8 \times 7^3$

Sol.52.(c) LCM of prime numbers = product of numbers
So ,the LCM of p and q is pq , then the numbers of p, q must be prime.

Sol.53.(a)
Let , two +ve numbers are = 5x and 4x
5x × 4x = 18000
$20x^2 = 18000 \Rightarrow x^2 = 900 \Rightarrow x = 30$
Sum of the numbers = 5x + 4x
= 9 × 30 = 270

Sol.54.(d)
The LCM of$(a^3 + b^3)$ and $(a^4 - b^4)$ is
= $(a^3 + b^3)$ $(a^2 + b^2)$ (a - b)

Sol.55.(c)
LCM of two prime numbers = 119
119 = 7 × 17
Both prime numbers are
X = 17 , y = 7
Now, 3y - x = 3 × 7 − 17 = 21 - 17 ⇒ 4

Sol.56.(d)
LCM of 4 , 5 , 6 , 15 and 18 = 180
Hence , 180 × 1 =180 (it's not a perfect square number),
$180 = 2^2 \times 3^2 \times 5$
For perfect square, we have to multiply with 5
Hence, least perfect square = 180 × 5
= 900

Sol.57.(b) LCM of (250, 2000, 120 and 750) paise = 6000 paise
6000 paise = 60 Rs

Sol.58.(b) L.C.M. of 4 and 8 = 8
Let total pocket money be 8 units.
Money spent on chocolates = 2 units
Money spent on Pizza = 1 units
Money left with him (5 units) = 40 Rs.
Total pocket money (8 units)
= 8 × 8 = 64 Rs.

Sol.59.(c)
$(x^3 + x^2 + x + 1)$ and $(x^3 + 2x^2 + x + 2)$
$x^3 + x^2 + x + 1$ =
$x^2 (x + 1) + (x + 1) = (x + 1)(x^2 + 1)$
$x^3 + 2x^2 + x + 2$ =
$x^2(x + 2) + (x + 2) = (x + 2)(x^2 + 1)$
Greatest common divisor (GCD)
of $(x^3 + x^2 + x + 1)$ and $(x^3 + 2x^2 + x + 2)$
$= (x^2 + 1)$

Sol.60.(a) According to question ,
L.C.M $(p , q) = 935$, $p > q$
So , possible pair of p and q are $(85 , 11)$ $(55 , 17)$ $(187 , 5)$
Therefore maximum sum of the digit of q = 1 + 7 = 8

Sol.61.(a) We know that
$(a^3 + b^3) = (a + b)(a^2 - ab + b^2)$
$(a + b)^2 = (a + b)(a + b)$, $(a^2 - b^2)$
$= (a + b)(a - b)$ ⇒Their HCF is $(a + b)$

Sol.62.(b) Other number
$\frac{L.C.M \times H.C.F}{first\ number} = \frac{434 \times 7}{14} = 217$

Sol.63.(a) 108 = 3 × 4 × 9
144 = 4 × 4 × 9
H.C.F of 108 and 144 = 4 × 9 = 36

Sol.64.(a) Numbers = 17 × 5 and 17 × 7
= 85, 119

Sol.65.(c) L.C.M = $\frac{Product\ of\ the\ numbers}{H.C.F} = \frac{1472}{8} = 184$

Sol.66.(d) 45 = 3 × 3 × 5
78 = 2 × 3 × 13
117 = 3 × 3 × 13
H.C.F of 45 , 78 and 117 = 3

Sol.67.(d) L.C.M of 3, 4, 5, 6 = 60

60) 2488 (41
-240
88
-60
28

60 - 28 = 32
32 must be added to 2488.

Sol.68.(d)
Smallest 6-digit number = 100000
L.C.M of 8, 10, 12, 16 = 240

240) 100000 (416
-960
400
-240
1600
-1440
160

240 – 160 = 80
Required number = 100000 + 80
= 100080

Sol.69.(c) Smallest 5- digit number = 10000
L.C.M of 15, 24, 35, 42 = 840

840) 10000 (11
-840
1600
-840
760

840 - 760 = 80 + 13 = 93
Required number = 10000 + 93 = 10093

Sol.70.(b)
Let the two numbers are x and y.
Product of the two numbers (xy)
= L.C.M × H.C.F = 5 × 120 = 600
Sum of their reciprocals
$= \frac{1}{x} + \frac{1}{y} = \frac{x + y}{xy} = \frac{55}{600} = \frac{11}{120}$

Sol.71.(a) Co-prime numbers are those whose H.C.F is 1
By options, H.C.F. of (17 , 23) = 1

Sol.72.(c) Let the numbers are a and b
Product of the numbers (ab) = L.C.M × H.C.F = 385 × 7 = 2695
Sum of the numbers (a + b) = 112
Difference of the numbers
(a - b) = $\sqrt{(a + b)^2 - 4ab}$
$= \sqrt{12544 - 10780} = \sqrt{1764} = 42$

Sol.73.(d) For same remainder, we have to find the HCF of the difference between the given numbers.
95 - 57 = 38 , 211 - 95 = 116 ,
211 - 57 = 154
HCF of 38 , 116 and 154 = 2
Therefore option (d) will be the right answer.

Sol.74.(b)
Sum of the numbers (x + y) = 54 ,
L.C.M = 84 , H.C.F = 6
Sum of their reciprocals
$= \frac{1}{x} + \frac{1}{y} = \frac{x + y}{xy} = \frac{54}{84 \times 6} = \frac{3}{28}$

Sol.75.(b)
Let the numbers are 3x and 2x.
Product of the numbers = L.C.M × H.C.F
= 24 × 4= 96
$3x \times 2x = 96 \Rightarrow 6x^2 = 96 \Rightarrow x$
$= \sqrt{\frac{96}{6}} = 4$
Greater number = 3x = 12

Sol.76.(b) 3808 - 13 = 3795 ,
4798 - 13 = 4785 , 5128 - 13 = 5115
H.C.F of 3795, 4785 and 5115 = 165
Sum of the digits = 1 + 6 + 5 = 12

Sol.77.(d) Other number
$= \frac{L.C.M \times H.C.F}{first\ number} = \frac{1920 \times 4}{60} = 128$

Sol.78.(b) Product of two numbers
= L.C.M × H.C.F = 245 × 7 = 1715

Sol.79.(a) Let the numbers be x and y.
$xy = 48$, $x - y = 13$ ..... (1)
$x + y = \sqrt{(x - y)^2 + 4xy}$
$= \sqrt{169 + 4 \times 48} = \sqrt{361} = 19$
$x + y = 19$ ..... (2)
By solving eq .(1) and (2) we get ,
x = 16 and y = 3
Hence the numbers are 3 and 16.

Sol.80.(c)
The numbers = $\frac{1600}{1}$, $\frac{1600}{2}$, $\frac{1600}{5}$
= 1600 , 800 , 320
HCF of (1600 , 800 , 320) = 160

Sol.81.(d)
HCF x LCM = PRODUCT OF THE NUMBER
L.C.M = $\frac{25}{5} = 5$

Sol.82.(a) Let the numbers are 4x and 3x.
$4x \times 3x = 432$
$\Rightarrow 12x^2 = 432 \Rightarrow x = \sqrt{36} = 6$
Numbers are 24, 18
L.C.M = 72 and H.C.F = 6
$\frac{1}{6} + \frac{1}{72} = \frac{13}{72}$

Sol.83.(c) Let the numbers be x and y.
x + y = 35 and L.C.M of x and y = 306
306 = 2 × 3 × 3 × 17 = 18 × 17
H.C.F = 1; first number = 17 and second number = 18

Sol.84.(a)
L.C.M of 4 , 8 , 12, and 24 = 24 minutes
After every 24 minutes four bells will ring together .
Now , no. of times they will ring in 4 hr = $\frac{4 \times 60}{24} = 10\ times$

Sol.85.(b)
L.C.M × H.C.F = Product of two number
$\Rightarrow L.C.M = \frac{8410}{29} = 290$

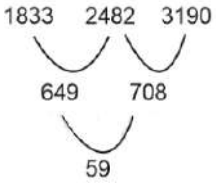
Sol.86.(b) Smallest 4-digit number = 1000
From factorization,
$24 = 2^3 \times 3$
$40 = 2^3 \times 5$
$56 = 2^3 \times 7$
L.C.M of 24, 40 and 56 = 840
Now, 840 × 2 =1680
Hence, the required number which is completely divisible by each of 24, 40 and 56 = 1680

Sol.87.(a) The numbers completely divisible by x = 7072 , 8505 , 9925
- 22 , - 45 , -55
7050 , 8460 , 9870
HCF of (7050, 8460 and 9870)
= 1410 = x
The sum of digits = 1 + 4 + 1 + 0 = 6

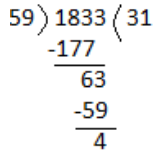
Sol.88.(d)HCF of the number of teachers (112 , 144 and 192) = 16
ATQ,
Minimum number of rooms =
$\frac{112}{16} + \frac{144}{16} + \frac{192}{16} \Rightarrow 7 + 9 + 12 = 28$

Sol.89.(d) As we know,
Dividend = Divisor x Quotient + Remainder
Last divisor = 15 and quotient = 2
Dividend = 15 x 2 = 30
Now,
Divisor = 30, Quotient = 5,
Remainder = 15
Dividend (a) = 30 x 5 + 15 = 165
Again,
Divisor = 165, Quotient = 1,
Remainder = 30
Dividend (b) = 165 x 1 + 30 = 195
Hence two numbers a = 165, b = 195
Least common multiple = 2145.

Sol.90.(c)



H.C.F of 649 and 708 = 59 So, x = 59



remainder = 4 , so, y = 4
(3x - 14y) = 3 × 59 - 14 × 4 = 177 - 56
= 121

Sol.91.(c)
1st no. × 2nd no. = L.C.M × H.C.F
Other number = $\frac{L.C.M \times H.C.F}{first\ number}$
$= \frac{24 \times 456}{96} = 114$

Sol.92.(a) The least number will be LCM of 8 and 12
So LCM of 8 and 12 = 24
Required value = 24 × 5 = 120

Sol.93.(c)
After subtracting remainder number be
72 122
-3 -7
69 115
HCF of 69 and 115 will be the required number,
HCF of 69 and 115 = 23

Sol.94.(c) Let the numbers are 5x and 7x.
H.C.F = 8
Then numbers = 40 and 56
Now, required L.C.M = 280

Sol.95.(c) Other number
= $\frac{L.C.M \times H.C.F}{first\ number} = \frac{459 \times 3}{51} = 27$

Sol.96.(d)
Other number = $\frac{L.C.M \times H.C.F}{first\ number}$
$= \frac{1080 \times 30240}{4320} = 7560$

Sol.97.(c)
Let the numbers are 11x and 17x
$17x - 11x = 18 \Rightarrow 6x = 18 \Rightarrow x = 3$
Numbers = 33 and 51
Now, H.C.F of the numbers = 3
L.C.M of the numbers = 561

Sol.98.(d) Other number
= $\frac{L.C.M \times H.C.F}{first\ number} \Rightarrow \frac{1260 \times 30}{180} = 210$

Sol.99.(d)
Let the numbers are 5x, 6x and 8x.
120x = 1200$\Rightarrow x = 10$
Sum of the numbers = 5x + 6x + 8x
= 50 + 60 + 80 = 190

Sol.100.(c) Let the first number be x and the second number be $\frac{3x}{2}$
L.C.M × H.C.F = Product of two number
$\Rightarrow x \times \frac{3x}{2} = 44 \times 264$
$\Rightarrow x^2 = \frac{44 \times 264 \times 2}{3} \Rightarrow x^2 = 7744$
$\Rightarrow x = 88$
Hence, the smaller number = 88

Sol.101.(d)
Let the L.C.M be x, then H.C.F be x - 630
$x + x - 630 = 1050$
$\Rightarrow 2x = 1050 + 630$
$\Rightarrow 2x = 1680 \Rightarrow x = 840$
Hence,
L.C.M = 840 and H.C.F = 840 - 630 = 210
So,
product of the numbers = L.C.M × H.C.F
= 840 × 210 = 176400

Sol.102.(b)
Co- prime numbers have always H.C.F 1.

Sol.103.(c) 588 = 2 × 2 × 3 × 7 × 7
Now, by options 35 cannot be the H.C.F of 588 because 5 is not a factor of 588.

Sol.104.(c) First five 2 digit positive even number = 10, 12, 14, 16, 18
LCM of 10, 12, 14, 16, 18 = 5040
So, smallest natural number = 5040

Sol.105.(d) LCM of 45, 75 and 90 = 450
450 second = 7.5 min
So, next change = 9:30 + 7.5 min
= 9 : 37 : 30 am

Sol.106.(b)
Let the numbers are x, y and z
According to the question,
xy = 432 , yz = 945
Middle number
= HCF of 432 and 945 = 27
First number = 16

Second number = 35
So, LCM of 27, 16 and 35 = 15120

Sol.107.(d) According to question,
To get remainder of 22 and 38 = 2000 - 22 = 1978 and 2200 - 38 = 2162
H.C.F of 1978 and 2162
= 2162 - 1978 = 184, therefore,
highest common factor of 1978 ,2162 and 184 = 46

Sol.108.(a) 50 - 1 = 49 , 58 - 2 = 56 and 69 - 6 = 63
H.C.F of 49 , 56 and 63 = 7
Hence, 7 is the required number.

Sol.109.(d)
3 m 96 cm , 5 m 28 cm and 7 m 92 cm
Or 396 cm , 528 cm and 792 cm
H.C.F of 396 , 528 and 792
396 = 2 x 2 x 3 x 3 x 11
528 = 2 x 2 x 2 x 2 x 3 x 11
792 = 2 x 2 x 2 x 3 x 3 x 11
H . C .F. = 2 x 2 x 3 x 11 = 132
Hence, the required greatest possible scale length = 1 m 32 cm

Sol.110.(c)
Let the two numbers be x and y.
Given, H.C.F = 15 and L.C.M = 300
$15x - 15y = 15$
$x - y = 1 \ldots\ldots\ldots (1)$
Product of the numbers = L.C.M × H.C.F
= 15 × 300 = 4500
$(15x) \times (15y) = 4500 \Rightarrow xy = 20 \ldots\ldots\ldots (2)$
By solving eq . (1) and (2) we get,
x = 5 and y = 4
Numbers = 75 and 60
Hence, the sum of the numbers
= 75 + 60 = 135

Sol.111.(d) LCM of 4, 20 and 28 = 140
HCF of 4, 20 and 28 = 4
Product = 140 × 4 = 560

Sol.112.(b) Product of the two numbers = L.C.M × H.C.F
$\Rightarrow 6 \times L.C.M = 2520 \Rightarrow L.C.M = 420$

Sol.113.(d)
Let , the no. is 12x and 12y
According to the question ,
$12x \times 12y = 2160$
$xy = 15$
Co-prime factor of 15 = 3 and 5
So, the numbers are 36 and 60 .
Short tricks:-
From the given options , only option (d) has the product equal to 2160.
or , the H.C.F. of the given no. in option (d) equals to 12 .

Sol.114.(a) L.C.M of 9, 24, 12 = 72
Let the number be 72 k + 4 .
Put k = 3, then the number becomes 220 which is divisible by 5.

Sol.115.(c)
L.C.M of 15 , 24 and 42 is 840
840 seconds means 14 min, they will toll after each 14 minutes.
So, between 8 a.m and 10 a.m ,
They will rang = $\frac{120}{14} + 1 = 9\ times.$

Sol.116.(d)
H.C.F of 96, 160 and 224 = 32
Hence, required minimum number of rooms= $\frac{96}{32} + \frac{160}{32} + \frac{224}{32}$
$= 3 + 5 + 7 = 15$

Sol.117.(b) H.C.F of 44 , 96 and 184 = 4
Hence, the required number = 4

Sol.118.(b)
Given, L.C.M = 5005 , H.C.F = 77
First number = 18 × 55 + 11 = 1001
Hence, the other number = $\frac{L.C.M \times H.C.F}{first\ no.}$
= $\frac{5005 \times 77}{1001} = 385$

Sol.119.(b) Given ratio → 3 : 5 : 7 and LCM = 5250 ⇒ 3 × 5 × 7 × k = 5250 (where k is constant)
⇒ 105k = 5250 ⇒ k = 50
So, middle number = 50 × 5 = 250

Sol.120.(d) Let the two numbers be 6x and 6y.
$6x + 6y = 48 \Rightarrow x + y = 8$
So, (5,3) and (7,1) are only two pairs.

Sol.121.(a) Given, L.C.M × H.C .F = 270
L.C.M × H.C .F = product of the two numbers
Other number = $\frac{L.C.M \times H.C.F}{first\ no.} = \frac{270}{18}$
$= 15$

Sol.122.(a) 7140 = 3 × 4 × 5 × 7 × 17
13200 = 2 × 2 × 2 × 2 × 3 × 5 × 5 × 11
So, the highest common prime factor is 5.

Sol.123.(c) We know that ,
Product of LCM and HCF = Product of two numbers
Hence ,
LCM × HCF = 18 × 25 = 450

Sol.124.(c) HCF of numerators (2, 4 and 3) = 1
LCM of the denominators(3,5 and 2) = 30
HCF of $\frac{2}{3}$, $\frac{4}{5}$ and $\frac{3}{2}$ = $\frac{1}{30}$

Sol.125.(b) HCF of 0.24 and 0.36 = 0.12

Sol.126.(c) LCM of 2, 4, 6 and 8 = 24 sec
Total seconds in 50 min = 3000 sec
Total number of chime = $\frac{3000}{24}$ = 125

Sol.127.(a)
Let their HCF = x and LCM = 14x
According to the question,
14x + x = 270
15x = 270 ⇒ x = 18 ⇒ HCF = 18
LCM = 14x = 14 × 18 = 252
Now,
HCF × LCM = First number × second number
18 × 252 = 36 × second number
So, second number = 126

Sol.128.(b) HCF of two numbers = 213
LCM of two numbers = 20 × 213 = 4260
If a number is divided by 225, quotient = 4 and remainder = 165
So, number = 225 × 4 + 165 = 1065
Now,
HCF × LCM = first number × second number
213 × 4260 = 1065 × second number
Second number = 852

Sol.129.(a) Let the HCF = x and LCM = 10x
According to the question,
x + 10x = 451 ⇒11x = 451
x = 41
So, HCF = x = 41 and LCM = 10x = 10 × 41 = 410
Sum of numbers = 287
Possible pairs = (41, 246), (82, 205)
But L.C.M. of (41, 246) = 246 ≠ 410
Satisfying pair = (82, 205)
So, one of the numbers = 82

Sol.130.(a)
LCM of 18, 16, 24 and 32 = 288
So, number = 288 + 5 = 293

Sol.131.(b)
LCM of 15, 18, 20 and 27 = 540
So, number = $\frac{(540 \times x) + 3}{53}$
Put the value of x = 5
number = $\frac{(540 \times 5) + 3}{53} \Rightarrow \frac{2703}{53}$ = 51
So Sum of the digits of number (2703) = 2 + 7 + 0 + 3 = 12

Sol.132.(a) LCM = 416 and HCF = 2
Ratio = 13 : 16
According to question,
13 × 16 × k = 416 ⇒k = 2
Greater number = 16k = 16 × 2 = 32

Sol.133.(c) Let the simplest ratio of numbers be: a : b HCF = 47
Numbers → 47a, 47b
Product = 6627

47a × 47b = 6627 ⇒ ab = 3
Possible pair = (1 : 3)
So, larger number = 47 × 3 = 141

Sol.134.(d) If the HCF of 408 and 1032 is expressed as 516m −252 × 4, then m is:
HCF of 408 and 1032 = 24
516m – 252 × 4 = 24
516m – 1008 = 24
516m = 1032 ⇒ m = 2

Sol.135.(b) If a and b are co-prime then LCM = a × b

Sol.136.(c) Given, tailor has 22 m cloth
As per question 1 meter cloth has = 5 pieces
So 22 meter cloth has= 5 × 22
= 110 pieces.

Sol.137.(c) LCM of 5, 15 and 35 = 35
So, number will be = 35k
Possible value of k = 1, 2, 3.....
Possible numbers = 35, 70, 105, 140, 175
Tripled the 35 = 35 × 3 = 105
When 105 is divided by 35 then remainder = 0
So, smallest number = 35

Sol.138.(c) L.C.M. of 8 and 10 = 40
Min. number of cap for required arrangements = 40 + 1 = 41
But the number of caps lies between 250 and 300 .
40 × 7 + 1 = 281

Sol.139.(d) 1683, 2244, 5049
By difference method :
we take difference of these numbers
2244 - 1683 = 561
5049 - 2244 = 2805 = 561 × 5
So 561 is highest common factor of 561 and 2805

Sol.140.(d) By difference method
4756 - 2996 = 1756 = 439 × 4
7825 - 4752 = 3073 = 439 × 7
here highest common factor is 439
4 × 3 × 9 = 108

Sol.141.(c)
LCM of (15, 25 , 35 , 40 , 42) is 840
So required number is (840k + 1)
and it is also divisible by 271
Remainder = $\frac{840k+1}{271} \Rightarrow 27k + 1$
27k +1 is divisible by 271 for k=10
So required number = 840 × 10 + 1
= 84001
Sum of the digits of number =
(8 + 4 + 0 + 0 + 1) = 13

Sol.142.(b) 72 = 2 × 2 × 2 × 3 × 3
108 =2 × 2 × 3 × 3 × 3
300 = 2 × 2 × 3 × 5 × 5
LCM = $2^3 \times 3^3 \times 5^2$
So, 8 × 27 × 125 = 27000
27000 is the smallest cube number.

Sol.143.(d) Let the HCF = x
LCM = 20x
As per question,
x + 20x = 504 ⇒ x = 24
So, HCF = 24 and LCM = 480
Let the numbers = a and b
We know,
LCM × HCF = Product of the number
ab = 11520
$(a - b)^2 = (a + b)^2 - 4ab$
$(24)^2 = (a + b)^2 - 4 \times 11{,}520$
$576 + 46{,}080 = (a + b)^2$
$(a + b) = 216$
So, sum of numbers = 216

Sol.144.(d) LCM of 24 and 18 = 72
HCF of 24 and 18 = 6
Difference between LCM and HCF
= 72 - 6 = 66

Sol.145.(a) Let the HCF = x
LCM = 35x
As per question,
35x - x = 238 ⇒ x = 7
HCF = 7
LCM = 35x = 35 × 7 = 245
We know,
LCM × HCF = Product of numbers
7 × 245 = ab ⇒ ab = 1715
a - b = 14 (given)
$(a + b)^2 = (a - b)^2 + 4ab$
$(a + b)^2 = 14^2 + 4 \times 1715$
$(a + b)^2 = 7056 \Rightarrow (a + b) = 84$
So, sum of number = 84

Sol.146.(b) Ratio of two number = 11 : 4
HCF = 16
So, numbers are 11 × 16 = 176 and 4 × 16 = 64
Required sum of number
= 176 + 64 = 240

Sol.147.(a) LCM of 80 and 120 = 240 min
So, they will meet after 240 min or 4 hours
So, required time = 6 pm + 4 = 10 pm

Sol.148.(a) LCM of 27, 54 and 72 = 216
Number = 216k (possible value of k = 6)
So, number = 216 × 6 = 1296

Sol.149.(b)
Smallest six digit number = 100000
$20 = 2^2 \times 5$
21 = 3 × 7
22 = 2 × 11
$24 = 2^3 \times 3$
$28 = 2^2 \times 7$
LCM of 20, 21, 22, 24 and 28
$= 2^3 \times 5 \times 7 \times 11 \times 3 = 9240$
Number = 9240k + 5 = 101645
When 101645 is divided by 462,
Quotient = 220

Sol.150.(d) 7105 - 6892 = 213
7531 - 7105 = 426
HCF of 6892, 7105, and 7531 = 213
Sum of digits = 2 + 1 + 3 = 6

Sol.151.(a)
Least four-digits number = 1000
LCM of 18, 27, 30, 40, and 45 = 1080
Remainder in each case = 9
So, number = 1080 + 9 = 1089
When 1089 is divided by 37,
remainder = 16

Sol.152.(b) According to the question,
8P × 8Q = 6400 ⇒ PQ = 100
Number of possible pairs = (4, 25) and (1, 100)

Sol.153.(b)
Let the numbers be 4x and 7x.
Given that, LCM = 28HCF
ATQ, LCM - HCF = 28HCF - HCF = 405
So, HCF = 15 then LCM = 28 × 15
Now, we know that,
LCM × HCF = The product of numbers
⇒ 15 × 28 × 15 = 4x × 7x
⇒ $x^2 = 15 \times 15 \Rightarrow x = 15$
So, The difference between the numbers = 3x = 45

Sol.154.(b)
H.C.F of $3x^2yz$, $5xy^2z$, $12x^2y^2z^3 = xyz$

Sol.155.(b)
Two prime numbers have H.C.F always 1.

Sol.156.(b) H.C.F of 288 and 468 = 36

Sol.157.(d) H.C.F of 384,256 and 480 = 32
Now, $\frac{384}{32} + \frac{256}{32} + \frac{480}{32}$
$= 12 + 8 + 15 = 35$

Sol.158.(d)
2307 - 7 = 2300 and 3105 - 5 = 3100
H.C.F of 2300 and 3100 = 100

Sol.159.(c)
Smallest number = 17×18 = 306

Sol.160.(a) 8000 < x < 8500
Divisors = 12, 14, 16, 35, 84
Remainders= 4, 6, 8, 27, 76
Difference between Divisor and Remainder=8(constant)
So, Concept used= (LCM of Divisors)k - Difference
Now, LCM(12,14,16,35,84)= 1680
Here, only possible value of k is 5
Now, 1680k - 8= 1680 × 5 - 8 = 8392
So, the tens value of x is 9.

Sol.161.(c) H.C.F of 24 and 18=6

Sol.162.(b) H.C.F of 1530 and 2380
1530 = 2 × 3 × 3 × 5 × 17
2380 = 2 × 2 × 5 × 7 × 17
H.C.F = 2 × 5 × 17 = 170

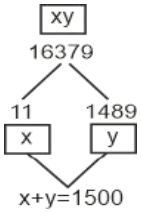
Sol.163.(d) Here we have to find the HCF of (155 - 5), (260 - 10), (315 - 15),
So the HCF of 150, 250, 300 is = 50,
i.e. the greatest number that will divide 155, 260, 315 and leave the remainder 5, 10 and 15 respectively is 50.

Sol.164.(a)
The smallest 5 digit number = 10000
Number nearest to 10000, divisible by 7 = 9996
So, the smallest 5 digit number which will leaves a remainder of 6 when divided by 7 is
= 9996 + 6 = 10002

Sol.165.(c)
Let the two numbers are a and b.
As the sum of the two numbers is 60 and their HCF and LCM are 12 and 72 respectively,
$\Rightarrow a + b = 60$ and $ab = 12 \times 72$
We have to find the sum of the reciprocal of the two numbers,

$$\Rightarrow \frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{60}{12 \times 72} = \frac{5}{72}$$

Sol.166.(a)
Let the two numbers are x and y,
i.e. $x + y = 1500$.....(i)
and xy = 16379 (LCM)
$(x - y)^2 = (x + y)^2 - 4xy$
x - y = 1478 ....(ii)
Adding (i) and (ii)
(x + y) + (x - y) = 1500 + 1478 = 2978
2x = 2978, x = 1489, y = 11
Short Tricks:-



Given that ,
x + y = 1500 and (L.C.M.) xy = 16379
In this type of question , make a factor of L.C.M. ⇒ 16379 = 11 × 1489
Clearly , condition satisfy ,
x + y = 11 + 1489 = 1500

Sol.167.(b)
The smallest four digit number = 1000,
So, nearest perfect number to it = 961,
So, the smallest number which should be subtracted from 1000 to make it a perfect square is
= (1000 - 961) = 39

Sol.168.(b)
Greatest 3 digit number = 999
Remainder left when greatest number divided by 24 = 15
Greatest 3 digit number divisible by 24 = 999 – 15 = 984
Similarly, smallest 4 digit number = 1000
Remainder left when smallest number divisible by 24 = 16
Smallest number divisible by 24 = 1000 + (24 – 16) = 1008
Hence, the sum of the greatest 3 digit number and the smallest 4 digit number that have 24 as their HCF
= (984 + 1008) = 1992

Sol.169.(c) The sum of the LCM and HCF of two numbers is 369 and the difference between the LCM and HCF of two numbers is 351. So,

$\Rightarrow$ LCM = $\frac{369 + 351}{2}$ = 360 &

HCF = $\frac{369 - 351}{2}$ = 9

⇒ (product of numbers) a × b = LCM × HCF
⇒ 72 × b = 360 × 9 ⇒ b = 45
i.e the second number is 45.

Sol.170.(b) The least number that which is divisible by 144,108 and 72 is its LCM = 432
So, the least number that when divided by 144,108 and 72 leaves the remainder 3 in each case is ⇒ (432 + 3) = 435

Sol.171.(d) The LCM of 5, 6, 7 is the least number which is divisible by 5, 6, 7 = 210.
And the multiples of the LCM = 210 are 420, 630, 840 which lies between the range of (250 - 1000). So, only 3 numbers from 250 to 1000 are exactly divisible by 5, 6 and 7.

Sol.172.(d)
Let the numbers be 26a and 26b.
Now we know, LCM × HCF = product of two numbers
26a × 26b = 156 × 26 ⇒ ab = 6
Again, the difference between the two numbers is also 26
26(a - b) = 26 ⇒ (a - b) = 1
So, ab = 6 & (a - b) = 1, which is only possible if a = 3 and b = 2,
Then the two numbers are,
a = 26 × 3 , b = 26 × 2,
So, the sum of the numbers
= 26 × (3 + 2) = 130

Sol.173.(d) The smallest number divisible by 27, 35, 25, and 21 is the LCM of these numbers.
LCM = 4725
So, the smallest number which when increased by 3, should give 4725.
i.e the number will be = (4725 - 3) = 4722

Sol.174.(a) We know, if two numbers are ax and bx, then their HCF = x,
Here, sum of the two numbers = 384 and HCF = x = 24
⇒ ax + bx = 384 ⇒ x.(a + b) = 384
⇒ 24(a + b) = 384 ⇒ (a + b) = 16
So, the possible values of a, b are
(1, 15), (2, 14), (3, 13), (4, 12), (5, 11), (6, 10), (7, 9), (8, 8)
But from the above pairs only for the pairs (1, 15), (3, 13), (5, 11) and (7, 9) the HCF will be 24.
So, four pairs of such numbers can be formed.

Sol.175.(c) HCF of two numbers = 6
LCM of two numbers = 84
1st number = 42
We have,
LCM × HCF = 1st number × 2nd number
84 × 6 = 42 × 2nd number

$\therefore$ 2nd number = $\frac{84 \times 6}{42}$ = 12

Sol.176.(a) ATQ,
Sum = 288 and HCF = 16
So the numbers can be 16x and 16y,
16x + 16y = 288
x + y = 18 ..... (where x and y are co-prime)
Numbers can be (1 , 17) , (5, 13) and (7 , 11)
3 pairs are possible, so 3 pairs of such numbers can be formed.

Sol.177.(b) LCM of (8,12,16) = 48
1st number that is multiple of 48 between 400 and 500 is = 432
And the 2nd number = 480
The remainder in each case should be 5 so the required numbers are
437 and 485.
Sum = 437 + 485 = 922

Sol.178.(d)
HCF × LCM = Product of two numbers
15 × 225 = 45 × 2nd Number

⇒ 2nd Number = $\frac{15 \times 225}{45}$ = 75

Sol.179.(d) LCM of (2, 4, 6, 8, 20) = 120 seconds = 2 minutes
No. of times they toll together

= $\frac{30}{2}$ +1 = 16

Sol.180.(c)
HCF × LCM = Product of two numbers
⇒ 48 × LCM = 48 × 144

$\therefore$ LCM = $\frac{48 \times 144}{48}$ = 144

Sol.181.(d) LCM of (6, 12, 16) = 48

The number which is divisible by 6, 12, and 16, must be divisible by 48.
The numbers between 400 and 600 which are divisible by 48 are = 432, 480, 528, 576
Sum = 432 + 480 + 528 + 576 = 2016

Sol.182.(d) LCM of 4, 5, 6, 8 = 120
When we divide 4707 by 120 we get remainder = 27
Required number that should be added = 120 - 27 = 93

Sol.183.(c) The LCM of two numbers is 91 times their HCF.
Let the HCF = x,
So the LCM = 91x,
According to the question,
91x + x = 92x = 2760
⇒ 92x = 2760 ⇒ x = 30
Again let the other number is y,
210 × y = 30 × 91 × 30
⇒ y = 390

Sol.184.(a) 55 - 3 = 52 , 72 - 7 = 65
123 - 6 = 117
The required number is the HCF of (52 , 65 , 117) = 13

Sol.185.(c) All the numbers from 2 to 10 are : 2, 3, 4, 5, 6, 7, 8, 9, 10 ;
The LCM = 2520 ;
Then the least number that is divisible by all the numbers from 2 to 10 is 2520 .

Sol.186.(d) The prime factorisation of 720 = 2 × 2 × 2 × 2 × 3 × 3 × 5
Therefore one more 5 is needed for a complete square .

Sol.187.(a) Let the HCF = x , LCM = 24x
A/Q, x + 24x = 750
⇒ 25x = 750 ⇒ x = 30
∴ HCF = 30 And LCM = 720
HCF × LCM = Product of two numbers
⇒ 30 × 720 = 90 × 2nd number
⇒ 2nd number = $\frac{30 \times 720}{90}$ = 240

Sol.188.(a)
LCM × HCF = Products of two numbers
⇒ 1920 ×16 = 240 × 2nd number
⇒ 2nd number = $\frac{1920 \times 16}{240}$ = 128

Sol.189.(c)
LCM of 10, 15, 20, 25 = 300 min.
= 5 hours
They ring together again at 10 a.m + 5 = 3 p.m.

Sol.190.(c) LCM of 15, 20, 25, 45 = 900
Greatest number of 4 digit = 9999
When we divide 9999 by 900 we get 99 as remainder.
The required 4 digit number
= 9999 - 99 = 9900

Sol.191.(c)
HCF × LCM = 1st no. × 2nd no.
⇒ 9 × 180 = 36 × N ⇒ N = $\frac{9 \times 180}{36}$ = 45

Sol.192.(d)
LCM of $\frac{2}{3}, \frac{4}{9}, \frac{8}{15}$ and $\frac{10}{21}$.
$= \frac{LCM\ of\ 2,4,8,10}{HCF\ of\ 3,9,15,21} = \frac{40}{3}$

Sol.193.(c)
1st Number = $3 \times 7 = 21$
2nd Number = $4 \times 7 = 28$
3rd Number = 5 × 7 = 35

Sol.194.(b)
LCM of (12, 16, 20, 25, 30) = 1200
The Required smallest number
= 1200 + 3 = 1203

Sol.195.(d) LCM of (25, 36, 40) = 1800
Number should be multiple of 1800
$1800 \times 2 = 3600$
Required smallest number = 3600 - 25 = 3575

Sol.196.(c) Divisible by the first ten natural numbers means that number should be divisible by 1,2,3,4,5,6,7,8,9,10.
LCM of 1,2,3,4,5,6,7,8,9,10 = 2520

Sol.197.(c) The LCM of 3, 4, 6, 8 = 24
Now divide 5474 by 24
We get Remainder as 2.
Now, value to add to 5474= Divisor − Remainder = 24 − 2 = 22.

Sol.198.(b) The L.C.M of any two consecutive positive integers x and x + 1 is always the multiple of those two numbers = x(x + 1);
Example- the L.C.M of 6,7 = 42.

Sol.199.(d) As we know product of any two numbers = product of LCM and HCF of those two numbers ;
Then the second number will be
= $\frac{70 \times 7}{35} = 14$

Sol.200.(c) LCM = 20 x 3 = 60 , HCF = 6
First Number = 12
Second Number = (LCM × HCF) ÷ First Number
Second Number = (60 × 6) ÷ 12 = 30

Sol.201.(b) Second Number = (HCF × LCM) ÷ First number
Second Number = (6 × 36) ÷ 12
Second Number = 18

Sol.202.(b) The highest number of players receiving the gifts will be = the HCF of 96, 180 = 12 ;

Sol.203.(c) H.C.F. of 24 and 144 = 24
A/Q, 10p + 4 = 24
⇒ 10p = 20 ⇒ p = 2

Sol.204.(a) Let the numbers be x and 7x.
LCM of x and 7x = 7x
A/Q, 7x = 721 ⇒ x = 103
Sum of both numbers
= 8x = 8 × 103 = 824

Sol.205.(b)
$\sqrt[2]{169}$ = 13, $\sqrt[3]{27}$ = 3, $\sqrt[3]{64}$ = 4, $\sqrt[2]{144}$ = 12
LCM of (13, 3, 4, 12) = 156

Sol.206.(a)
Given , LCM = 78 , HCF/GCD = 13 and one number = 26
Let, The 2nd numbers = X
We know that, the product of the two numbers = LCM × HCF
26 × X = 78 × 13 ⇒ X = 39

Sol.207.(d) HCF of 85 and 153 = 17
Then 17 = 85x - 153
x = 170 ÷ 85 = 2

Sol.208.(d) 252 is divisible by 63, 36, 28, 42, 14 but 252 is not divisible by 56.
So, x ≠ 56

Sol.209.(d)
LCM of (7, 14, 28, 35, 42) = 420

Sol.210.(c) Let the numbers be 2x and 3x
HCF × $LCM = Product\ of\ two\ numbers$
⇒ 9600 = $2x \times 3x$ ⇒ 9600 = $6x^2$
⇒ $x^2 = 1600 \Rightarrow x = 40$
Sum of numbers = $5x = 5 \times 40 = 200$

Sol.211.(a) Co prime numbers are the pair of numbers having HCF = 1
LCM of co-prime numbers = product of numbers = 119

Sol.212.(a) Subtracting 6 from 2400 and 4 from 1810
2400 − 6 = 2394 , 1810 − 4 = 1806
HCF of 2394 and 1806 is
2394 → 2 × 3 × 3 × 7 × 19
1809 → 2 × 3 × 7 × 43
HCF (2394 , 1806) = 42
42 is the greatest number that will divide 2400 and 1810 and leave remainder 6 and 4 .

Sol.213.(c) LCM of 8 , 12 and 16 = 48
A/Q
48x + 3
let x= 1,2,3 ...
48 × 1 + 3 = 51
48 × 2 + 3 = 99

48 × 3 + 3 = 147
147 divided by 7 leaves no remainder.

Sol.214.(c) (x + 3) exactly divides 1391
LCM (7, 9,11) → 693
Now, 1391 is divided by 693 then we get the remainder of 5.
A/Q,
(x + 3) = 5 ⇒ x = 2

Sol.215.(d) LCM of 2 , 6 , 4 and 3 = 12
Now 3496 is divided by 12 then we get 4 remainder.
So, 12 - 4 = 8, when we added 8 in 3496 then 3496 + 8 =3504 is completely divisible by 2, 6, 4, and 3.

Sol.216.(c) The ratio of two numbers is 5 : 6 and their HCF is 6. Their LCM is :
Let the numbers be 5x and 6x
So the HCF of 5x and 6x is 6
So, x = 6,
Numbers 5x and 6x are 30,36
LCM (30, 36) = 180

Sol.217.(b)

One number = $2 \times 44 = 88$
HCF × $LCM = Product\ of\ two\ numbers$
$\Rightarrow 44 \times 264 = 88 \times 2nd\ number$
$\Rightarrow 2nd\ number = \frac{44 \times 264}{88} = 132$

Sol.218.(c) Factor of 21 = 3 × 7
Factor of 24 = 2 × 2 × 2 × 3
Factor of 30 = 2 × 5 × 3
Factor of 35 = 7 × 5
LCM of 21 , 24 , 30 and 35
= 2^3 × 3 × 5 × 7 = 840
Then number = 840 + 3 = 843

Sol.219.(a) HCF [(a - b),(b - c)] will be the greatest number that gives the same remainder when we divide a, b and c by the greatest number. So,
Greatest no. = HCF [(226 - 151),(151 - 76)]
HCF = [75 , 75] = 75
Hence, 75 will be the greatest number such that when 76, 151 and 226 are divided by it, The remainder is alike.

Sol.220.(c)
LCM of 16, 18, 24 and 28 = 1008
A/Q

Initial number = Final number - 7

⇒ 1008 - 7 = 1001

Sol.221.(d) LCM of 4, 6, 7, 8 and 12 seconds = 168 seconds
After 168 seconds, they will toll together again.

Sol.222.(a)
HCF× $LCM = Product\ of\ two\ numbers$
$\Rightarrow 11 \times 330 = 55 \times 2nd\ no.$
$\Rightarrow 2nd\ number = \frac{11 \times 330}{55} = 66$

Sol.223.(a)
Given numbers are = 128, 303, 247
Remainders = 4, 7, 19
128 - 4 = 124, 303 - 7 = 296,
247 - 19 = 228
HCF of (124, 296, 228) = 4.

Sol.224.(b)
$LCM \times HCF = Product\ of\ two\ numbers$
$\Rightarrow c \times HCF = a \times b$
$\Rightarrow HCF = \frac{ab}{c}$

Sol.225.(a) LCM of (42, 49, 56, 63)
= 3528
Now, 3528 - 3500 = 28
So we should add 28 to 3500.

Sol.226.(a) Let, the numbers are = 25X and 25Y
25X + 25Y = 850 ⇒ 25(X + Y) = 850
X + Y = 34 (i.e. 9 + 25 = 34)
So, The possible condition - (25 × 9), (25 × 25)= 225 , 625

Sol.227.(d) HCF of 288 and 108 = 36
Maximum value of x = 36

Sol.228.(d) The HCF of even numbers should be at least 2 because 2 is a factor of all even numbers.

Sol.229.(c) HCF = 5
So the number should be multiple of 5
Between 25 and 40 two numbers are multiple of 5 = 30 , 35
HCF × LCM = Product of two numbers
⇒ 5 × 210 = 1050
Product of 30 and 35 = 1050
Sum of numbers = 30 + 35 = 65

Sol.230.(b) Let the numbers be x and y
A/Q, x + y = 66
product of two numbers = HCF × LCM
xy = 3 × 315 = 945
Now, $\frac{1}{x} + \frac{1}{y} = \frac{x+y}{xy} = \frac{66}{945} = \frac{22}{315}$

Sol.231.(c) LCM of (42, 63, 84) = 252 sec

Sol.232.(c) HCF of 13 , 26 and 39 = 13
Greatest number = 13 - 1 = 12

Sol.233.(d) Given , LCM of x and y is 2079 and their HCF is 27
we know that , LCM × HCF = X × Y
2079 × 27 = 189 × Y
⇒ Y = $\frac{2079 \times 27}{189}$ = 297

Sol.234.(d) LCM of $\sqrt{36}$ and $\sqrt{64}$
= LCM of 6 and 8 = 24

Sol.235.(d) LCM of (2, 3, 4, 5, 6) = 60
Required number should be divisible by 7
So number will be in the form of 60k + 1
Put k = 5
60 × 5 + 1 = 301
Shortcut -directly check the multiple of 7

Sol.236.(b) Let ,the numbers are A and B , LCM = 102 , HCF = 2
A/Q , A + B = 72 --------(i)
and A × B = HCF × LCM
A × B = 2 × 102 ⇒ A × B = 204
The sum of the reciprocals = $\frac{1}{A} + \frac{1}{B}$
= $\frac{B+A}{AB} = \frac{72}{204} = \frac{6}{17}$

Sol.237.(d) HCF = 60 , LCM = 420
Let , first number = x
Applying Formula , **Dividend = Divisor × Quotient + Remainder**
A/Q , a = 2 × 60 + 0 , a = 120 (1st number)
LCM × HCF = 1st number × 2nd number
420 × 60 =120 × 2nd number
2nd number = 210

Sol.238.(a) 18 apple trees, 21 mango trees and 39 orange trees
Total number of trees = 78
HCF (18 , 21 , 39) = 3
Now , minimum number of rows
= $\frac{78}{3}$ = 26

Sol.239.(d) Let, the numbers are X and Y
Product of the LCM and HCF of two positive numbers is 72 means XY = 72
And X - Y = 1 -------- (i)
$(X - Y)^2 = (X + Y)^2 - 4XY$
$1 = (X + Y)^2 - 4 \times 72$
$1 = (X + Y)^2 - 288$
$(X + Y)^2 = 289$
X + Y = 17 ----- (ii)
From equation (i) and (ii)
X = 8 and Y = 9

Sol.240.(d)
HCF × LCM = 1st number × 2nd number ------(i)
Ist number ÷ 3 = 75
Ist number = 75 × 3 = 225
Putting the value of first number in equation (i)
75 × 450= 225 × 2nd number
Then 2nd number = 150

Sol.241.(d) Number of integers divisible by 3 = $\frac{100}{3}$= 33 (Quotient)
Number of integers divisible by 4 = $\frac{100}{4}$ = 25
LCM of 3 and 4 = 12

Number of integers divisible by both 3 and 4 = $\frac{100}{12} = 8$

Required number of integers = 33 + 25 - 8 = 50

Sol.242.(d) LCM of 12, 15, 18 = 180
Largest number of 4 digit = 9999
The required number must be multiple of 180
When we divide 9999 by 180 we get 99 as remainder
9999 - 99 = 9900

Sol.243.(d)
Product of two numbers = HCF × LCM
$\Rightarrow 32 \times 2nd\ number = 8 \times 96$
$\Rightarrow 2nd\ number = \frac{8 \times 96}{32} = 24$

Sol.244.(c)
Product of two numbers = HCF × LCM = 36
Let the numbers be a and b
ab = 36
And a - b = 5 $\Rightarrow a = 5 + b$
Put the value of 'a' in the first equation
(5 + b) b = 36 = 9 × 4
On comparing both sides, we get
b = 4
a = 5 + 4 = 9

Sol.245.(c) Let the HCF = x, LCM = 26x
And x + 26x = 729
$\Rightarrow 27x = 729 \Rightarrow x = 27$
HCF = 27 And LCM = 702
Product of two numbers = HCF × LCM
⇒ 81× 2nd number = 27 × 702
2nd number = $\frac{27 \times 702}{81} = 234$

Sol.246.(c)
Smaller number = $13 \times 29 = 377$

Sol.247.(b) HCF of co prime numbers =1
Product of two numbers = LCM × HCF
⇒ 29 × 2nd number = 638 × 1
⇒ 2nd number = $\frac{638}{29}$ = 22

Sol.248.(d) Weight of each piece = HCF of ($4\frac{1}{2}$ lbs, $6\frac{3}{4}$lbs and $7\frac{1}{5}$lbs)
HCF of ($\frac{9}{2}$, $\frac{27}{4}$, $\frac{36}{5}$)
$= \frac{HCF\ of\ (9, 27, 36)}{LCM\ of\ 2, 4, 5} = \frac{9}{20}$
Total weight of cakes = $\frac{9}{2} + \frac{27}{4} + \frac{36}{5}$
$= \frac{90 + 135 + 144}{20} = \frac{369}{20}$
the maximum number of guests that can be served = $\frac{369}{20} \div \frac{9}{20}$
$= \frac{369}{20} \times \frac{20}{9} = 41$

Sol.249.(a) The remainders are = 2, 3, 4
38 - 2 = 36
45 - 3 = 42
52 - 4 = 48
HCF of (36, 42, 48) = 6

Sol.250.(d) Given , 1st number = 248 , 2nd number = 868 , LCM = 1736
The product of two number = HCF × LCM
248 × 868 = HCF × 1736
HCF = 124

Sol.251.(c)
Product of two numbers = LCM × HCF
80 × 2nd number = 20 × 400
⇒ 2nd number = $\frac{20 \times 400}{80} = 100$

Sol.252.(d) LCM of (2 , 5 , 7 , 8 , 10) = 280
Therefore , 280 × 1 , 140 × 2
Least perfect square = 140^2= 19600

Sol.253.(a) HCF of 220 cm , 260 cm and 300 cm = 20 cm

Sol.254.(c) LCM 5 ,4 ,6 and 7 = 420
Then , least number = 420k + 5
When k =1 ,
Number = 425

Sol.255.(a) Let , two numbers are x and y
Sum of two number 60 means ,
x + y = 60 ------(i)
x - y = 60/6 = 10 , x - y = 10 -----(ii)
From equation (i) and (ii)
X = 35 , y = 25
So that , LCM of x and y = 175

Sol.256.(b)
Ist pendulum strike once in 3/2 seconds
2nd pendulum strike once in 7/5 second
LCM of $\frac{3}{2}$ and $\frac{7}{5}$ = 21
So, they stick together after every 21 seconds.
In 1 min. Pendulum strike 2 times

Sol.257.(a) HCF of co prime numbers = 1
HCF × LCM = Product of two numbers
$\Rightarrow 1 \times LCM = 104 \Rightarrow$ LCM = 104

Sol.258.(b) Let the numbers are = x and y
Product of two numbers = product of HCF and LCM
xy = 32 and x - y = 4
$(x + y)^2 = (x - y)^2 + 4xy$
$(x + y)^2$ = 16 + 4 × 32
$(x + y)^2$= 144 ⇒ x + y = 12

Sol.259.(a) $697 = 41 \times 17$
a = 41 and b = 17
Now,
a - 2b = 41 - 34 = 7
[Hint : to find 41 and 17 we have to take help of last digit , in this that is 7 so expected pairs are (11,7) ,(11,17), (31,17), (41,17)]

Sol.260.(c) LCM = $1 \times 2 \times 5 = 10$
10 unit = 120 ⇒ 1 unit = 12
HCF = 1 unit = 12

Sol.261.(a) LCM of 6, 9 and x = 72
LCM of 6 and 9 = 18
X should be multiple of 4 , 3 and 2
Least value of x = 24

Sol.262.(d) HCF of any two consecutive natural number = 1

Sol.263.(c)
Let the numbers be 14x and 14y
14(x + y) = 98 ⇒ x + y = 7
x and y both should be prime numbers
If x = 2 , y = 5 , If x = 3, y = 4
If x = 1, y = 6
3 pairs of x and y are possible .

Sol.264.(c) HCF of fractions
$= \frac{HCF\ of\ numerator}{LCM\ of\ denominator}$

Sol.265.(b) Product of the two numbers = HCF × LCM
$\Rightarrow 210 \times 2nd\ number = 30 \times 2310$
$\Rightarrow 2nd\ number = \frac{30 \times 2310}{210} = 330$

Sol.266.(c) LCM of (4, 6 and x) = 12x
The LCM must be multiple of 12.

Sol.267.(d)
LCM of 2 ,4,6,8,10 and 12 = 120 sec
10 min = 10 × 60 = 600
They have tolled together = $\frac{600}{120}$ = 5
In starting all bells are tolling together
So, 5 + 1 = 6 times

Sol.268.(a) LCM of (5, 6, 8, 9, 12)= 360
Number should be divisible by 13
Number is in the form of (360k + 1)
360k + 1
Put k = 10
3600 + 1 = 3601

Sol.269.(c) Remainders are = 11 and 13
627 - 11 = 616
233 - 13 = 220
HCF of (616 and 220)
$616 = 2 \times 2 \times 2 \times 7 \times 11$
$220 = 2 \times 2 \times 5 \times 11$
$HCF = 2 \times 2 \times 11 = 44$

Sol.270.(a)
Ratio of the given number = 7x : 9x
Product of two numbers = LCM × HCF
7x × 9x = 25200
63 x^2 = 25200 ⇒ x = 20

Then ,
the sum of the numbers = (7x + 9x)
= 140 + 180 = 320

Sol.271.(b)
LCM of 105 , 210 and 420 = 420
420 trees can be planted.

Sol.272.(c) Let one number = x
Other number = x + 2
Product of two numbers = LCM × HCF
$\Rightarrow x(x+2) = 24 = 4 \times 6$
On comparing both sides we get x = 4
Numbers are 4 and 6.

Sol.273.(c)
LCM of (20, 28, 36, 48) = 5040
5824 - 5040 = 784

Sol.274.(a) HCF = 8 and LCM = 160
Let the numbers be 8x and 8y
Product of two numbers = HCF × LCM
$\Rightarrow 8x \times 8y = 8 \times 160$
$\Rightarrow xy = 20 = 4 \times 5$
x and y should be relatively prime number , HCF = 1
∴ x = 4 and y = 5
Sum of numbers = 8 (x+ y)
= 8 (4 + 5) = 72

Sol.275.(b) HCF of (24, 32, 42) = 2
Greatest length which can measure all the given lengths = 2 m

Sol.276.(a) HCF of two numbers = 31
Numbers will be = 31x and 31y
Sum of numbers = 31 (x + y) = 434
x + y = $\frac{434}{31} = 14$
x and y should be relatively prime numbers.
x= 1 and y = 14 , x = 3 and y = 11
x = 5 and y = 9
Only these three pairs are possible.

Sol.277.(c) LCM of 4 ,6,9,15 = 180
Remainder = 3
Number should be = 180 + 3 = 183
Required number that should be added = 183 - 166 = 17

Sol.278.(c) Factor of 56 = 2 × 2 × 2 × 7
Factor of 84 = 2 × 2 × 3 × 7
LCM = $2^3 \times 3 \times 7 = 168$
HCF = 2 × 2 × 7 = 28
Ratio between LCM and HCF = 168 : 28
= 6 : 1

Sol.279.(c) Given , HCF = 4 and product of the numbers = 48
Let ,numbers are = x and y
When 48 divided by 4 then we get 12
So , one number = 4 and 2nd number = 12 (4 is common factor)

Sol.280.(c) Let the numbers are 3x and 4x
LCM = 12x = 180 ⇒ $x = 15$
Larger number = 4x = $4 \times 15 = 60$

Sol.281.(a) The LCM of two numbers is 126 and their HCF is 2.
Here one number is 18,
Then the other is = $\frac{126 \times 2}{18} = 14$;

Sol.282.(a)
The LCM of 4,5,8,16 and 32 is = 160
The least square number that is exactly divisible by 4,5,8,16 and 32 i.e. nearest to 160 and a multiple of 160 is = 160 × 10 = 1600

Sol.283.(c)
The LCM of 9,16,20 or 24 is = 720
Then the least number that when divided by 9,16,20 or 24, leaves 3 as remainder in each case is = (720 + 3) = 723

Sol.284.(a)
The LCM of 5, 6, 8, 9 and 12 = 360
So, the least number that on being divided by 5, 6, 8, 9 and 12 leaves 4 as the remainder in each case is (360 + 4) = 364

Sol.285.(a)
LCM of 18 , 21 , 25 , and 39 = 40950
Remainder = 3
Required number = 40950 + 3 = 40953
Sum of the digits = 4 + 0 + 9 + 5 + 3 = 21

Sol.286.(c)
Ist numbers = x , 2nd numbers = y
The product of the LCM and HCF of two positive numbers = 28
LCM × HCF = XY = 28
(x - y) = 3 ------(i)
$(X - Y)^2 = X^2 + Y^2 - 2XY$
$9 = X^2 + Y^2 - 2 \times 28$
$9 + 56 = X^2 + Y^2$
$X^2 + Y^2 = 65$
Now , the value of $(X^2 + Y^2)$ is putting in the below equation
$(X + Y)^2 = X^2 + Y^2 + 2XY$ -----(ii)
$(X + Y)^2 = 65 + 2 \times 28$
$X + Y = \sqrt{121}$
X + Y = 11 -----(iii)
From equation (i) & (iii)
X = 7 , Y = 4

Sol.287.(c) LCM of 22,34 and 40 = 7480

Sol.288.(d) HCF of $\frac{2}{3}, \frac{8}{9}, \frac{16}{81}, \frac{10}{27}$
= $\frac{HCF\ of\ 2, 8, 16, 10}{LCM\ of\ 3, 9, 81, 27} = \frac{2}{81}$

Sol.289.(c) LCM of 3, 4, 5, 6 = 60
When we divide 2495 by 60 we get 35 as remainder
Now, 60 - 35 = 25
25 should be added

Sol.290.(d) LCM of (15, 21, 35) = 105
Greatest 5 digits number = 99999
When we divide 99999 by 105, we get remainder 39
Now,
99999 - 39 = 99960

Sol.291.(b) HCF of (204, 136, 119) = 17

Sol.292.(d) Given , LCM = 24
1st number = 1x
2nd number = 2x
LCM= 1 × 2 × x = 24
2x = 24 ⇒ x = 12
1st number = 1x = 12 and
2nd number = 24
Hence , the product of the numbers
= 12 × 24 = 288

Sol.293.(c) Factor of 6 = 2 × 3
Factor of 10 = 2 × 5
Factor of 15 = 3 × 5
Factor of 24 = 2 × 2 ×2× 3
LCM of 6 , 10 , 15 and
24 = 2 × 2 × 2 × 3 × 5 = 120
Hence , least number = 120 + 5 = 125

Sol.294.(a) Remainder should be 3
39 - 3 = 36, 84 - 3 = 81
HCF of (36, 81) = 9
Required Greatest number = 9

Sol.295.(c)
Product of two numbers = HCF × LCM
$\Rightarrow 148 \times 2nd\ number = 37 \times 740$
$\Rightarrow 2nd\ number = \frac{37 \times 740}{148} = 185$

Sol.296.(c)
LCM of 9 ,16 , 20 and 24 = 720
least number = 720 + 3= 723

Sol.297.(a)
LCM of 4 , 5 , 8 , 16 , and 32 = 160
Least square number = 1600

Sol.298.(c)
Let the numbers are = 3x and 5x
LCM = 105
$\Rightarrow 15x = 105 \Rightarrow x = 7$
Difference of the numbers = 2x
= $2 \times 7 = 14$

Sol.299.(d) x and y are prime numbers
LCM = 319 = 11× 29
X = 29 and y = 11
Now, 2x - 5y = $2 \times 29 - 5 \times 11 = 3$

Sol.300.(c) LCM of 2, 3 , and 8 = 24
second term = 24 × 2 - 1 = 47

Sol.301.(b) HCF of 25 and 45 = 5
So that, the maximum capacity of a container = 5 litre.

Sol.302.(d) LCM = 2400, HCF = 20
When we divide the first number by 8, the quotient is 60
First number = $8 \times 60 = 480$
Product of two numbers = HCF×LCM
$\Rightarrow 480 \times second\ number = 20 \times 2400$
$\Rightarrow Second\ number = \frac{20 \times 2400}{480} = 100$

Sol.303.(b) LCM of 2, 3, 4, 5, 6, = 60
Required number should be multiple of 60
$2 \times 60 = 120$
When we subtract 1 from 120 we can check that when we divide 119 by 2, 3, 4, 5, and 6 leaves remainder 1,2, 3, 4, and 5 respectively.

Sol.304.(a) Prime factorisation of 3675
$= 5 \times 5 \times 7 \times 7 \times 3$
For perfect square, one more 3 should be there , $3675 \times 3 = 11025$

Sol.305.(a) LCM of 4 , 5 , 9 and 12 = 180
By the option ,
900/180 = 5
Hence , The least perfect square number completely divisible by 4,5,9 and 12
= 900

Sol.306.(a)
LCM of 18 , 30 ,40 and 45 = 360
least number = 360 + 7 = 367

Sol.307.(d) LCM of 30, 40 45 = 360

Sol.308.(b)
HCF × LCM = product of the numbers
$3 \times 60 = 12 \times X \Rightarrow X = \frac{180}{12} = 15$

Sol.309.(c) Let , numbers be X and Y
LCM = 1326 and HCF = 3 , X - Y = 27
Product of the numbers = LCM × HCF
= 1326 × 3 = 3978
$X + Y = \sqrt{(X - Y)^2 + 4XY}$
$= \sqrt{(27)^2 + 4 \times 3978} = \sqrt{16641} = 129$

Sol.310.(b) Let the numbers be x and y
Product of two numbers = LCM × HCF
$\Rightarrow xy = 315 \times 21 = 6,615$
$x - y = 42$
$(x + y)^2 = (x - y)^2 + 4xy$
$(x + y)^2 = 42^2 + 4 \times 6615$
$(x + y)^2 = 1764 + 26460$
$(x + y)^2 = 28224 \Rightarrow x + y = 168$

Sol.311.(c)
Product of two numbers = LCM × HCF
⇒ 12 × 2nd number = 60 × 3
$\Rightarrow 2nd\ number = \frac{180}{12} = 15$

Sol.312.(d)
LCM × $HCF = product\ of\ two\ numbers$
$\Rightarrow 90 \times HCF = 270$
$\Rightarrow HCF = \frac{270}{90} = 3$

Sol.313.(b)
The LCM of 45 and 55 is = 495
Then the least number, which, when divided by 45 and 55 leaves a remainder of 3 in each case is = 495 + 3 = 498

Sol.314.(a)
The HCF of $\sqrt{64}$ and 16 = 8
The LCM of $\sqrt{64}$ and 16 = 16
The ratio of the HCF to the LCM of the numbers $\sqrt{64}$ and 16 = $\frac{8}{16} = \frac{1}{2} = 1 : 2$

Sol.315.(d) HCF of 15, 25 and 42
$15 = 3 \times 5$
$25 = 5 \times 5$
$42 = 2 \times 3 \times 7$
HCF = 1

Sol.316.(c) Factor of 35 = 5 × 7
Factor of 40 = 2 × 2 × 2 × 5
Factor of 60 = 2 × 2 × 3 × 5
LCM of 35 , 40 , 60 = 2 × 2 × 2 × 3 × 5 × 7 = 840
Smallest number = 840 + 7 = 847

Sol.317.(a) Given , LCM = 1736 , Numbers are 248 and 868
We know that,
product of the numbers = LCM × HCF
248 × 868 = 1736 × HCF
HCF = 124

Sol.318.(d) HCF of 44, 22, 55 = 11 cm

Sol.319.(c) 155 - 5 = 150
307 - 7 = 300
HCF of 150 and 300 = 150

Sol.320.(c) LCM of 9, 8, 10, 12 = 360
Remainder = 3
So the required number = 360 + 3 = 363

Sol.321.(b) LCM + HCF = 682
LCM - HCF = 638
On solving both, we get
LCM = 660 and HCF = 22
Let the numbers are x and y
Product of two numbers = LCM × HCF
$\Rightarrow xy = 660 \times 22$
$= 14520 = 220 \times 66$
And $x + y = 286 = 220 + 66$
On comparing x = 220 and y = 66

Sol.322.(c)
Let the numbers be = 3x and 2x
LCM = 6x = 96 ⇒ $x = 16$
Numbers are =
$3 \times 16 = 48\ and\ 2 \times 16 = 32$

Sol.323.(b) HCF of 391 and 323 = 17
Now ,
group of the boys in the class
= $\frac{391}{17}$ = 23
group of the girls in the class = $\frac{323}{17}$ = 19
Hence , minimum numbers of groups
= 23 + 19 = 42

Sol.324.(d) Let numbers be 3x and 7x
HCF of both numbers = 3
Than numbers will be 9 and 21
LCM of 9 and 21 = 63

Sol.325.(b) Let the numbers are x and y
Product of two numbers = HCF × LCM
$\Rightarrow xy = 18 \times 378$
$\Rightarrow xy = 18 \times 3 \times 126 = 54 \times 126$
x = 54 , and y = 126

Sol.326.(d) X + Y = 40 ------ (i)
X - y = 20 ----- (ii)
From equation (i) & (ii)
X = 30 and Y = 10
Then HCF of 30 and 10 = 2 × 5 = 10

Sol.327.(a) The HCF of the first 100 natural numbers is 1 .
[because there are prime numbers 2, 3, 5, ..which can't have factors other than 1]

Sol.328.(d) As we know :
GCD × LCM = product of the two numbers
So, the other number will be
= $\frac{270 \times 9}{27}$ = 90

Sol.329.(b)
The LCM of 16, 18, 27, and 45 is = 2160
The smallest number that can be divided exactly by 16, 18, 27, and 45 is 2160.

Sol.330.(a) The product of two numbers is 259200 and their LCM is 4320.
⇒ LCM × HCF = 259200
⇒ HCF = $\frac{259200}{4320} = 60$
The HCF of the same two numbers is 60.

Sol.331.(d)
Product of numbers = LCM × HCF
$\Rightarrow 120 = LCM \times 2 \Rightarrow$ LCM = 60

Sol.332.(c) LCM of two numbers = 1024
$1024 = 2^{10}$
Where, 2 is prime number

2 is the highest common factor on the given observation.
So that , 2 is GCD (HCF)

Sol.333.(b)
18 - 11 = 7 , 24 - 17 = 7
Required number = LCM of (24,18) - 7
= 72 - 7 = 65

Sol.334.(c)
LCM of (20, 25, 35, 40) = 1400
20 - 15 = 25 - 20 = 35 - 30 = 40 - 35 = 5
Required least number = 1400 - 5 = 1395

Sol.335.(d) L.C.M of $\frac{1}{18}$ and $\frac{1}{24}$
$= \frac{L.C.M\ of\ numerator}{H.C.F\ of\ denominator} = \frac{1}{6}$
H.C.F of $\frac{1}{18}$ and $\frac{1}{24}$
$= \frac{H.C.F\ \ of\ numerator}{L.C.M\ \ of\ denominator} = \frac{1}{72}$

Sol.336.(d)
Product of two co-prime number = 903
As we know, the product of two co-prime numbers is equal to their L.C.M.
So, L.C.M of the two numbers = 903

Sol.337.(d)
Let the H.C.F of both the number = x
Numbers are in the ratio 2x and 3x
$\Rightarrow 6x = 48 \Rightarrow x = 8$
Hence, the numbers are 16 and 24
Required sum → 16 + 24 = 40

Sol.338.(a) Let number be 4x and 5x
So LCM of 4x and 5x is 20x
According to the question,
20x = 180 ⇒ x = 9
So numbers will be 4x ⇒ 4 × 9 = 36
And 5x ⇒ 5 × 9 = 45
So the sum is 36 + 45 = 81

Sol.339.(c) LCM of (5,6,7,8) = 840
Required no. should be → $\frac{840x + 3}{9}$
Putting the value of x = 2 , we get
$840x + 3$ = 840 × 2 + 3 = 1683 which is multiple of 9.

Sol.340.(c) HCF of (36 , 45 , 72) = 9
The biggest measurment that can measure all these exactly = 9

Sol.341.(d) The maximum number of children = HCF of (429,715) =143

Sol.342.(a) Because we know that
HCF of co- prime number is always 1

Sol.343.(b) Let, the first number x and second number $4x$
first number × second number
= L.C.M × H.C.F
$(x) \times (4x) = 84 \times 21 \rightarrow x = 21$
So , the smallest number is 21 .

Sol.344.(d) Greatest number that will exactly divide 25, 35, 40,and 30
⇒ HCF of (25, 35, 40, and 30) ⇒ 5

Sol.345.(a) Let the other number be y.
Ratio of L.C.M. and H.C.F. = 92 : 1
A.T.Q, 93 unit = 372
1 unit = 4 so, L.C.M = 368 and H.C.F. =4
First number × Second number
= L.C.M × H.C.F
368 × y = 368 × 4
y = $\frac{368 \times 4}{368}$ = 4

Sol.346.(c) Let the age of father and son be 2x years and x years.
According to question, HCF(2x , x) =
x = 22 So,the age of son is 22 years.

Sol.347.(d) Remainder theorem
$\frac{LCM\ of\ (6\ ,9\ ,15\ ,18)x + 4}{7} = \frac{90x + 4}{7}$
By putting the value of x= 4, the given equation is satisfy
So, the required number is 364.

Sol.348.(a) Ratio of number → 15 : 11
And their H.C.F. = 13
So, 1st no. =15 × 13 and 2nd no. =
11 × 13
L.C.M. of these no. = 15 × 11 × 13 = 2145

Sol.349.(b) If , HCF is 29 then number will be 29x and 29y
Sum → 29(x + y) = 232 ⇒ (x + y) = 8
Possible value of x and y are
→ (0 , 8) , (1 , 7) , (2 , 6)....and so on
Only option (b) satisfy the condition ,
No. are 29 × 1 = 29 and 29 × 7 = 203

Sol.350.(d)
Let , 1st no. be (1657 - 6 = 1651) and
2nd no. be (2037 - 5 = 2032)
Factor of 1651 = 13 × 127 and
Factor of 2032 = 16 × 127
HCF of (1651 , 2032) = 127
127 is the greatest number which on dividing 1657 , 2037 leaves
remainder 6 and 5 respectively .

Sol.351.(b) HCF × LCM = 1st no. × 2nd no.
72 × 1008 = 144 × 2nd no.
⇒ 2nd no. = 504

Sol.352.(a) LCM of $\{a(a + b)\ ,\ \}$ = ab (a + b)
HCF of $\{a(a + b)\ ,\ b(a + b)\}$ = (a + b)

Sol.353.(a) LCM of the prime numbers is the product of those numbers.
Therefore the LCM of a,b and c = abc

Sol.354.(d) LCM of 27, 18, 15 and 12
= 540
Largest 4-digit no. = 9999
On dividing 9999 by 540 , remainder will be 279
Therefore , the largest four digit number that is divisible by 27 , 18 , 15 and 12 is
→ 9999 −279 = 9720

Sol.355.(a) Let , number's are 400 - 9
= 391, 435-10 = 425, and 541-14 = 527
Factor of 391 = 17 × 23
Factor of 425 = 5 × 5 × 17
Factor of 527 = 17 × 31

HCF (391 , 425 , 527) = 17

Sol.356.(d) LCM of 12, 15, and 20 = 60
According to options smallest 3 digit number is 120 which is divisible
by 12 , 15 , 20

Sol.357.(b) LCM (k , 36) = 72 ...(given)
So , 72 will be divisible by both k and 36 .
So , the possible value of k is (8 , 24 , 72)

Sol.358.(d)
H.C.F. $\left(a^3b^3c^3,\ a^2b^2c^2,\ abc\ , a^2bc\right)$ = abc

Sol.359.(c) Let A and B be the numbers , and their HCF = 9
According to question ,
Ratio of numbers (A : B) = 5 : 7
So, number (A)= 5 × 9 = 45 and number (B) = 7 × 9 = 63
Required difference = 63 - 45 =18

Sol.360.(d) Let two number
be a and (35 − a)
According to the question
a × (35 − a) = 150
a^2 − 35a + 150 ⇒ a = 30 , 5
So, the numbers are 30 and 5
Now sum of their reciprocals
$\Rightarrow \frac{1}{30} + \frac{1}{5} \Rightarrow \frac{7}{30}$
And the difference of the reciprocals
$\Rightarrow \frac{1}{5} - \frac{1}{30} \Rightarrow \frac{5}{30}$
Required H.C.F. $(\frac{7}{30}, \frac{5}{30}) = \frac{1}{30}$

Sol.361.(c) 48 = 2 × 8 × 3
54 = 2 × 9 × 3
L.C.M.(48,54) = 2 × 3 × 8 × 9 = 432

Sol.362.(c)
Smallest 5 digit number = 10000
Dividing 10000 by 97, we get the remainder as 9.
The smallest 5 digit number
= (10000 + 97 - 9) = 10088.
So, sum of the digits of the number
= 1+ 0 + 0 + 8 + 8 = 17

Sol.363.(d)
Let , the numbers are $2x$ and $3x$.

LCM $(2x, 3x) = 2 \times 3 \times x$
According to question ,
$2 \times 3 \times x = 48 \Rightarrow x = 8$
Then , sum of numbers
$(2x + 3x) = 5x = 40$

Sol.364.(c) L.C.M. of (56 , 50) = 1400

Sol.365.(b) L.C.M. × H.C.F.=1st number × 2nd number
64 × 16 = 64 × X ⇒ X = 16

Sol.366.(c) L.C.M.× H.C.F.= 1st number × 2nd number
156 × 12 = 12 × X ⇒ X = 156

Sol.367.(a)
L.C.M. × H.C.F. = 1st number × 2nd number
182 × 13 = 13 × x ⇒ x = 182

Sol.368. (d) As we know that product of L.C.M. and H.C.F. of the numbers is equal to products of the numbers ,
L.C.M. × H.C.F. = 1st number × 2nd number
1st number × 2nd number = 30 × 9 = 270

Sol.369.(a) As we know that product of L.C.M. and H.C.F. of the numbers is equal to products of the numbers ,
L.C.M. × H.C.F. = 1st number × 2nd number
1st number × 2nd number = 45 ×10 = 450

Sol.370.(b) Let the total no of cakes be 6 i.e. LCM of (2,3)

No of cakes that Tapas had = $\frac{1}{2}$ × 6 = 3

No of cakes that Rishi had = $\frac{1}{3}$ × 6 = 2

Remaining cakes = 6 - (3 + 2) = 1

Avi's share of the cake = $\frac{1}{6}$

Sol.371.(c)
LCM of (8, 15, 20) = 8 × 5 × 3 = 120 .
Now, to make it a perfect square no, it should be multiplied by 2 × 5 × 3 = 30.
So, the required no = 120 × 30 = 3600

Sol.372.(c)
Let the two no's be 15x and 11x
So, the HCF of 15x and 11x = x = 13
Hence, the two no's are 15 × 13 = 195 and 11 × 13 = 143

Sol.373.(d) L.C.M of (4, 5, 6, 7) = 420
Required number = 420 + 3 = 423

Sol.374.(d)
Common difference → 20 - 14 = 25 - 19 = 35 - 29 = 40 - 34 = 6
LCM of (20, 25, 35 and 40) = 1400
Required no = 1400 - 6 = 1394

Sol.375.(b) Let the other number be x
ATQ,
12 × 72 = 24 × x ⇒ 864 = 24x
⇒ x = $\frac{864}{24}$ = 36

Sol.376.(c)
Largest 5 - digit number = 10000
L.C.M of 12,18,20,25 = 900
By dividing 10000 by 900 we get remainder as 100
Required number
= 10000 + (900 - 100) = 10800

Sol.377.(a) L.C.M of 15, 30 and 45 = 90
90 means 1 hour and 30 minutes.
So, they will ring at = 8:00 AM + 1 hr 30 minutes = 9:30 AM.

Simplification

KEY POINTS

1). $(a + b)^2 = a^2 + b^2 + 2ab$

2). $(a - b)^2 = a^2 + b^2 - 2ab$

3). $a^2 - b^2 = (a + b)(a - b)$

4). Square root of a number is a value that, when multiplied by itself, gives the given number.

Example :-

36 has two square roots 6 and -6;

$6^2 = 36$ *and* $-6^2 = 36$, hence we write $\sqrt{36} = \pm 6$

5). Square root by Factorization method

Find square root of 1089

First find the factors of 1089.

3	1089
3	363
11	121
	11

$1089 = 3 \times 3 \times 11 \times 11$

$\sqrt{1089} = 3 \times 11 = 33$

6). Square root by Division method

Find square root of 2304.

	48
4	$\overline{23}$ $\overline{04}$
+4	16
88	704
	704
	xxx

Note:- Make group of two digit from right

$\sqrt{2304} = 48$

7). If $\sqrt{?} = x$, then the required number will be = x^2

8). $\sqrt{a^4 \times b^4 \times c^4} = a^2b^2c^2$

9). $\sqrt{a^n \times b^m} = a^{\frac{n}{2}} \times b^{\frac{m}{2}}$

10). $\frac{\sqrt{x}}{\sqrt{y}} = \sqrt{\frac{x}{y}}$

11). $\sqrt{x} \times \sqrt{y} = \sqrt{xy}$

12). If any number ends with 1, its square root will end with 1 or, 9, given that the number is a perfect square.

Example:- $\sqrt{81} = 9, \sqrt{121} = 11$

13). If any number ends with 4, its square root will end with 2 or 8, given that the number is a perfect square.

Example: $\sqrt{324} = 18, \sqrt{144} = 12$

14). If any number ends with 5, its square root will end with 5, given that the number is a perfect square.

Example: $\sqrt{225} = 15, \sqrt{625} = 25$

15). If any number ends with 6, its square root will end with 6, given that the number is a perfect square.

Example: $\sqrt{256} = 16, \sqrt{676} = 26$

16). If any number ends with 9, its square root will end with 3 or 7, given that the number is a perfect square.

Example: $\sqrt{49} = 7, \sqrt{169} = 13$

17). The square of any number always ends with 0, 1, 4, 5, 6 or, 9 but will never end with 2, 3, 7 or, 8.

18). If in a given number, the total number of digits are n and if n is even, the square root of that number will have $\frac{n}{2}$ digits and if n is odd, then the number of digits will be $\frac{n+1}{2}$.

19). $\sqrt{x\sqrt{x\sqrt{x...n}}} = x^{\frac{2^n-1}{2^n}}$

Example

Find the value of $\sqrt{2\sqrt{2\sqrt{2\sqrt{2\sqrt{2}}}}}$

Here, n = 5, $\therefore \sqrt{2\sqrt{2\sqrt{2\sqrt{2\sqrt{2}}}}}$

$= 2^{\frac{2^5-1}{2^5}} = 2^{\frac{31}{32}}$

20). $\sqrt{x\sqrt{x\sqrt{x...\infty}}} = x$;

Example $\sqrt{7\sqrt{7\sqrt{7...\infty}}} = 7$

21). To find the value of $\sqrt{x + \sqrt{x + \sqrt{x + ...\infty}}}$, find the factors of x, such that the difference between the factors is 1, then the larger factor will be the result.

22). To find the value of $\sqrt{x - \sqrt{x - \sqrt{x - ...\infty}}}$, find the factors of x, such that the difference between the factors is 1, then the smaller factor will be the result.

Example: Find the value of $\sqrt{12 + \sqrt{12 + \sqrt{12 + ...\infty}}}$

The factors of 12 with a difference of 1 are 4, 3. Here, 4 is the larger number.

$\therefore$ Value will be 4.

Conventional method:

Let $\sqrt{12 + \sqrt{12 + \sqrt{12 + ...\infty}}} = x$

$\Rightarrow \sqrt{12 + x} = x$

$\Rightarrow 12 + x = x^2 \Rightarrow x^2 - x - 12 = 0 \Rightarrow x^2 - 4x + 3x - 12 = 0$

$\Rightarrow (x - 4)(x + 3) = 0$

$\Rightarrow x = 4 \; and \; x = -3$

$\therefore x = 4$

Example :- Find the value of $\sqrt{30 - \sqrt{30 - \sqrt{30 - ...\infty}}}$.

The factors of 30 with a difference of 1 are 5, 6. Here, 5 is the smaller number. $\therefore$ Value will be 5.

23). If any number is in $\frac{1}{\sqrt{a} \pm \sqrt{b}}$ form, then we multiply by its rationalization factor $\sqrt{a} \mp \sqrt{b}$ in both numerator and denominator.

Example: Find the value of $\frac{1}{\sqrt{9}-\sqrt{8}}$;

$\frac{1}{\sqrt{9}-\sqrt{8}} = \frac{1}{\sqrt{9}-\sqrt{8}} \times \frac{\sqrt{9}+\sqrt{8}}{\sqrt{9}+\sqrt{8}}$

$= \frac{\sqrt{9}+\sqrt{8}}{\sqrt{9}^2 - \sqrt{8}^2} = \frac{3 + 2\sqrt{2}}{1} = 3 + 2\sqrt{2}$

Cube and Cube Root

KEY POINTS

1) If a number is multiplied two times with itself, then the result of this multiplication is called the cube of that number.

Example: $2 \times 2 \times 2 = 2^3$

Cube root of $2^3 = \sqrt[3]{2^3} = 2^{3 \times \frac{1}{3}} = 2^1 = 2$

2) Algebraic method to calculate cube:

$(a + b)^3 = a^3 + 3ab(a + b) + b^3$

$(a - b)^3 = a^3 - 3ab(a - b) - b^3$

Indices and Surds

Key Points:

1) $p^m \times p^n = p^{m+n}$

2) $(p^m)^n = p^{mn}$

3) $\frac{p^m}{p^n} = p^{m-n}$

4) $(\frac{p}{q})^n = \frac{p^n}{p^n}$

5) $p^0 = 1$

6) $p^{-n} = \frac{1}{p^n}$

7) $p^{\frac{1}{m}} = \sqrt[m]{p}$

8) $\sqrt[m]{p} = p^{\frac{1}{m}}$

9) $\sqrt[m]{pq} = \sqrt[m]{p} \times \sqrt[m]{q}$

10) $\sqrt[m]{\frac{p}{q}} = \frac{\sqrt[m]{p}}{\sqrt[m]{q}}$

11) $(\sqrt[m]{p})^m = p$

12) $p^{\frac{m}{n}} = \sqrt[n]{p^m}$

13) $\sqrt[m]{\sqrt[n]{p}} = \sqrt[m \times n]{p}$

KEY POINTS

1). Conversion of complex arithmetic expressions into simple ones is called Simplification.

2). VBODMAS Rule: Vinculum > Brackets > Of > division > multiply > addition > subtraction

* First solve vinculum i.e. bar.

Eg: $(7 - \overline{5 - 4}) = ?$

First solve 5 − 4 i.e. 1 then 7 -1 = 6.

* For brackets open first small brackets (....), then {...} and then [...].

* For modulus e.g. |-3| we write magnitude only not sign i.e. 3 in this case.

Important Formulas

1). $(a + b)^2 = a^2 + 2ab + b^2$

2). $(a - b)^2 = a^2 - 2ab + b^2$

3). $(a^2 - b^2) = (a + b)(a - b)$

4). $(a+b)^3 = a^3 + b^3 + 3ab(a+b)$

5). $(a-b)^3 = a^3 - b^3 - 3ab(a-b)$

6). $(a^3 + b^3) = (a+b)(a^2 - ab + b^2)$

7). $(a^3 - b^3) = (a-b)(a^2 + ab + b^2)$

8). $a^3 + b^3 + c^3 - 3abc =$

$(a+b+c)\left(a^2+b^2+c^2-ab-bc-ca\right)$

$= \frac{1}{2}(a+b+c)[(a-b)^2 + (b-c)^2 + (c-a)^2]$

Here, if $(a+b+c) = 0$,

then $a^3 + b^3 + c^3 - 3abc = 0$

$\Rightarrow a^3 + b^3 + c^3 = 3abc$

9). $(a+b+c)^2 = \left(a^2+b^2+c^2\right) + 2(ab+bc+ca)$

Variety Questions

Q.1. Express $0.4\overline{24}$ in the form $\frac{p}{q}$, where p and q are integers and q ≠ 0.
Group D 17/08/2022 (Afternoon)
(a) $\frac{14}{33}$ (b) $\frac{41}{165}$ (c) $\frac{13}{33}$ (d) $\frac{41}{990}$

Q.2. The value of $0.1\overline{6} + 0.1\overline{5} - 0.1\overline{3}$ is:
Group D 17/08/2022 (Evening)
(a) $\frac{17}{90}$ (b) $\frac{34}{45}$ (c) $\frac{23}{63}$ (d) $\frac{19}{99}$

Q.3. The value of $5^3 \times 5^4 \times 5^2$ = ?
Group D 18/08/2022 (Morning)
(a) 5^9 (b) 5^7 (c) 5^6 (d) 5^5

Q.4. Simplify $(\frac{1}{3})^{-3} + (\frac{1}{5})^{-4} + (\frac{1}{15})^{-2}$.
Group D 18/08/2022 (Evening)
(a) 877 (b) 856 (c) 777 (d) 756

Q.5. Which of the following options is the closest approximate value which will come in place of question mark(?) in the following equation?
$(\sqrt{360} + 12 \div 6 \times 3 - \sqrt{170}) \div 2 = ?$
Group D 22/08/2022 (Morning)
(a) 4 (b) 6 (c) 5 (d) 8

Q.6. Simplify:
$3x(x-6) + x^2 + 6x - 9 + 24 - x^3$.
Group D 22/08/2022 (Morning)
(a) $15 - 12x + 4x^2 + x^3$
(b) $15 + 12x + 4x^2 - x^3$
(c) $15 - 12x + 4x^2 - x^3$
(d) $15 + 12x + 4x^2 + x^3$

Q.7. The value of $(a + \frac{1}{b})^r (a - \frac{1}{b})^s \div (b + \frac{1}{a})^r (b - \frac{1}{a})^s$ is ?
Group D 22/08/2022 (Morning)
(a) $(\frac{a}{b})^{r+s}$ (b) $(\frac{b}{a})^{r+s}$
(c) $(ab)^{r+s}$ (d) $\frac{a^r}{b^s}$

Q.8. If $2^{3k-5} = 4096$, then find the value of k.
Group D 23/08/2022 (Evening)
(a) 11 (b) 7 (c) $\frac{13}{6}$ (d) $\frac{17}{3}$

Q.9. Simplify: $\frac{4.32 \times 4.32 - 2.64 \times 2.64}{1.68}$
Group D 24/08/2022 (Morning)
(a) 6.56 (b) 6.94 (c) 6.99 (d) 6.96

Q.10. Simplify:
$(x^2 + m^2 - z^2)^2 - (x^2 - m^2 + z^2)^2$ = ?
Group D 24/08/2022 (Morning)
(a) $3x^2(m^2 - z^2)$ (b) $4x^2(m^2 - z^2)$
(c) $2x^2(m^2 - z^2)$ (d) $4x(m^2 - z^2)$

Q.11. Arrange the following fractions in ascending order.
$\frac{1}{3}, \frac{4}{7}, \frac{2}{5}, \frac{5}{6}, \frac{3}{5}$
Group D 24/08/2022 (Afternoon)
(a) $\frac{1}{3}, \frac{2}{5}, \frac{4}{7}, \frac{3}{5}, \frac{5}{6}$ (b) $\frac{2}{5}, \frac{1}{3}, \frac{3}{5}, \frac{4}{7}, \frac{5}{6}$
(c) $\frac{5}{6}, \frac{1}{3}, \frac{4}{7}, \frac{2}{5}, \frac{3}{5}$ (d) $\frac{1}{3}, \frac{2}{5}, \frac{3}{5}, \frac{4}{7}, \frac{5}{6}$

Q.12. If $\frac{a+1}{a}$ = k, then find the value of $\frac{a^2-1}{a^2}$.
Group D 24/08/2022 (Afternoon)
(a) $k - 2k^2$ (b) $k^2 + 2$ (c) $k + 2$ (d) $2k - k^2$

Q.13. Convert $0.2\overline{36}$ into a vulgar fraction.
Group D 25/08/2022 (Afternoon)
(a) $\frac{7}{33}$ (b) $\frac{9}{44}$ (c) $\frac{17}{66}$ (d) $\frac{13}{55}$

Q.14. Simplify
$(a+2b-c)(b-c) + (a-c)2b + b^2$.
Group D 25/08/2022 (Evening)
(a) $3ab - 5bc - ac - 2abc$
(b) $2b^2 + 3ab - 4bc + c$
(c) $3b^2 + c^2 + 3ab - 5bc - ac$
(d) $3b^2 + 3ab - 5bc - ac$

Q.15. The numerator of a fraction is one less than the denominator. If 6 is added to the numerator, the fraction will be equal to $\frac{5}{4}$. Find the fraction.
Group D 30/08/2022 (Morning)
(a) $-\frac{20}{21}$ (b) $\frac{19}{20}$ (c) $\frac{20}{21}$ (d) $-\frac{21}{20}$

Q.16. A man plants 21,025 mango trees in his garden in such a way that there are as many rows as there are mango trees in each row. Find the number of rows.
Group D 30/08/2022 (Afternoon)
(a) 130 (b) 135 (c) 145 (d) 125

Q.17. $\frac{a^{10} \times b^{-7} \times c^{-4}}{a^{-5} \times b^2 \times c^5}$ in simplified form is:
Group D 30/08/2022 (Evening)
(a) $a^{15} \times b^9 \times c^9$ (b) $a^5 \times b^{-9} \times c^{-9}$
(c) $a^5 \times b^9 \times c^{-9}$ (d) $a^{15} \times b^{-9} \times c^{-9}$

Q.18. The value of
$\sqrt{75 + \sqrt{41 - \sqrt{21 + \sqrt{19 - \sqrt{9}}}}}$ is:
Group D 02/09/2022 (Afternoon)
(a) 9 (b) 3 (c) 6 (d) 5

Q.19. If $(\frac{12}{7})^5 \times (\frac{7}{12})^8 \times (\frac{12}{7})^{16} = (\frac{7}{12})^{2m+10}$, then m = ?
Group D 08/09/2022 (Afternoon)
(a) - 1 (b) $\frac{23}{2}$ (c) $\frac{19}{2}$ (d) $-\frac{23}{2}$

Q.20. Simplify
$\frac{6+6\times6}{3\times3+5} \div \frac{\frac{1}{2} \div \frac{1}{2} of \frac{1}{2}}{\frac{1}{2} \div \frac{1}{2} \times \frac{1}{2}}$
Group D 14/09/2022 (Morning)
(a) $\frac{1}{3}$ (b) $\frac{4}{3}$ (c) 3 (d) $\frac{3}{4}$

Q.21. Convert $\frac{7893}{9990}$ to its recurring decimal form.
Group D 17/09/2022 (Afternoon)
(a) $0.7\overline{990}$ (b) $0.7\overline{900}$ (c) $0.\overline{790}$ (d) $0.\overline{799}$

Q.22. the value of $[(k^a)^{b-c} \times (k^b)^{c-a} \times (k^c)^{a-b}] \times (x^0 - 1)$ is
Group D 17/09/2022 (Evening)
(a) a + b + c (b) abc (c) 0 (d) 1

Q.23. The value of
$\left[x^{m(n-p)} . x^{n(p-m)} . x^{p(m-n)}\right]\left[\sqrt[4]{625} - \sqrt{25}\right]$
is _____.
Group D 19/09/2022 (Afternoon)
(a) 1 (b) 2 (c) 5 (d) 0

Q.24. $If\ x = -\frac{1}{2}\ and\ y = 2$, Find the value of : $\frac{4y}{5}(y - x) - 35[\frac{3x-4y}{5} - \frac{1}{10}\{3x - \frac{5}{7}(7x - 4y)\}]$.
Group D 20/09/2022 (Evening)
(a) 94 (b) 91 (c) 90 (d) 92

Q.25. What is the sum of
$7xy + 5yz - 3zx, 4yz + 9zx - 4y, -3xy + 5x - 2xy$?

Group D 06/10/2022 (Evening)
(a) $5x - 4y + 2xy + 9yz + 6zx$
(b) $5x - 4y - 2xy - 9yz + 6zx$
(c) $5x - 4y + 6x + 9yz + 6zx$
(d) $5x - 4y + 6xy + 9yz - 6zx$

Q.26. Find the product of the greatest among the numbers 0.82, 0.802,0.85,0.085 with the smallest among the number 0.3,0.03,0.203,2.03
NTPC CBT II Level 5 (12/06/2022) Shift 1
(a) 0.246 (b) 0.0255
(c) 0.0225 (d) 0.2406

Q.27. 0.46 × 137.5 = 63.25, What is the value of 460 × 1.375 ?
NTPC CBT II Level 2 (13/06/2022) Shift 2
(a) 63.25 (b) 6.325 (c) 632.5 (d) 6325

Q.28. The value of (919 + 9.019 + 0.919 + 9.0019) is
NTPC CBT II Level 3 (14/06/2022) Shift 1
(a) 937.3999 (b) 973.9399
(c) 937.9399 (d) 973.9939

Q.29. By how much does
$\frac{12}{(\frac{13}{14})}$ exceed $\frac{(\frac{12}{13})}{14}$?
NTPC CBT II Level 2 (16/06/2022) Shift 1
(a) $13\frac{6}{7}$ (b) $5\frac{5}{17}$ (c) $12\frac{6}{7}$ (d) $13\frac{1}{6}$

Q.30. Simplify the following expression :
$\frac{5.5^3 - 4^3}{30.25 + 22 + 16}$
NTPC CBT II Level 2 (16/06/2022) Shift 2
(a) 9.5 (b) 0.75 (c) 1.5 (d) 14.25

Q.31. What will be value of
$\frac{1}{0.0001191}$, if $\frac{1}{11.91}$ = 0.083963
NTPC CBT II Level 2 (16/06/2022) Shift 3
(a) $10^6 \times 0.083963$ (b) $10^4 \times 0.083963$
(c) $10^7 \times 0.083963$ (d) $10^5 \times 0.083963$

Q.32. If, P = 2 + 0.2 ÷ (0.2 x 2) - 1 x 2 and Q = 2 - 0.2 ÷ (0.2 x 2) - $\frac{1}{2}$ x 2, then $\frac{P}{Q}$ is the equal to :
NTPC CBT - I 28/12/2020 (Evening)
(a) 1.0 (b) 1.5 (c) - 0.5 (d) 0.5

Q.33. In his career, a tennis player won 5 matches, lost 12 matches and had 3 matches as draw. The fraction of the matches he lost in his career is :
NTPC CBT - I 29/12/2020 (Evening)
(a) $\frac{2}{5}$ (b) $\frac{1}{5}$ (c) $\frac{3}{5}$ (d) $\frac{12}{5}$

Q.34. Sunila had $9\frac{1}{4}$ kg of flour to make bread with. If the recipe says, she needs $1\frac{1}{8}$ kg to make one loaf of bread, how many bread can she make ? Estimate to the nearest whole number.
NTPC CBT - I 30/12/2020 (Morning)
(a) 7.22 (b) 10 (c) 8.22 (d) 9

Q.35. If $f(x) = \frac{x+1}{x-1}$, find the value of f (f (f (2))) .
NTPC CBT - I 12/01/2021 (Evening)
(a) 2 (b) 1 (c) - 1 (d) 3

Q.36. If $\sqrt{54} + \sqrt{150} = 19.60$, then what will the value of $\sqrt{216} + \sqrt{96}$ *be*? Give your answer, correct to one decimal place.
NTPC CBT - I 17/01/2021 (Evening)
(a) 24.6 (b) 24.5 (c) 23.9 (d) 17.7

Q.37. What is the sum of the following two series ?
(8 + 27 + 64 + ……+ 1000) + (2 + 4 + 6 + ……+ 20) = ?
NTPC CBT - I 21/01/2021 (Morning)
(a) 3133 (b) 3134 (c) 3135 (d) 3136

Q.38. On simplification , $\frac{2^{10} - 3^{10}}{5^{10} - 6^{10}}$ is:
NTPC CBT - I 21/01/2021 (Evening)
(a) Cannot be defined
(b) a negative rational number
(c) neither a positive nor a negative rational number
(d) a positive rational number

Q.39. The mixed surd form of $\sqrt{1350}$ is ?
NTPC CBT - I 21/01/2021 (Evening)
(a) $12\sqrt{6}$ (b) $15\sqrt{6}$ (c) $13\sqrt{6}$ (d) $14\sqrt{6}$

Q.40. How many one-thirds are there in 72 ?
NTPC CBT - I 21/01/2021 (Evening)
(a) 144 (b) 24 (c) 216 (d) 288

Q.41. The numerator of a fraction is increased by 20% and the denominator is decreased by 50%. If the resultant fraction is $\frac{5}{6}$, Then what will be the original fraction?
NTPC CBT - I 23/01/2021 (Evening)
(a) $\frac{25}{84}$ (b) $\frac{25}{72}$ (c) $\frac{72}{25}$ (d) $\frac{25}{12}$

Q.42. What will be the value after simplifying this continued fraction?
$$\frac{1}{2 + \frac{1}{3 + \frac{1}{1 + \frac{1}{4}}}}$$
NTPC CBT - I 03/02/2021 (Evening)
(a) $\frac{43}{5}$ (b) $\frac{43}{19}$ (c) $\frac{5}{19}$ (d) $\frac{19}{43}$

Q.43. If $\sqrt{2116}$ = 46 then find the value of $\sqrt{21.16} + \sqrt{0.2116} + \sqrt{0.002116} + \sqrt{0.00002116}$.
NTPC CBT - I 27/02/2021 (Evening)
(a) 5.1106 (b) 5.1116
(c) 5.0016 (d) 5.0006

Q.44. If a ⊕ b = a - b + $\frac{1}{\sqrt{ab}} + \sqrt{(\frac{a}{b})}$, *then* 0.9 ⊕ 0.1 = ?
NTPC CBT - I 01/03/2021 (Morning)
(a) $\frac{30}{212}$ (b) $\frac{214}{30}$ (c) $\frac{212}{30}$ (d) $\frac{30}{214}$

Q.45. The sum of
$\frac{1}{2} + \frac{1}{6} + \frac{1}{12} + ... + \frac{1}{n(n+1)}$ is:
NTPC CBT - I 02/03/2021 (Evening)
(a) $\frac{n(n+1)}{22}$ (b) $\frac{n+1}{n}$
(c) $\frac{n+1}{2n}$ (d) $\frac{n}{n+1}$

Q.46. Select the number that can replace the question mark (?) in the following equation.
$47^{7.5} \div 47^{3/2} \times 47^{-3} = (\sqrt{47})^?$
NTPC CBT - I 05/03/2021 (Morning)
(a) 2.5 (b) 5 (c) 6 (d) 4

Q.47. The positive value of
$\sqrt{6 + \sqrt{6 + \sqrt{6 + ...}}}$ is:
NTPC CBT - I 11/03/2021 (Morning)
(a) 4 (b) 3.5 (c) 3 (d) 2

Q.48. Find the value of
$\frac{3\sqrt{2}}{\sqrt{6} + \sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6} + \sqrt{2}} - \frac{6}{\sqrt{8} - \sqrt{12}}$.
NTPC CBT - I 11/03/2021 (Evening)
(a) $5\sqrt{3}$ (b) $5\sqrt{2}$ (c) $4\sqrt{2}$ (d) $6\sqrt{3}$

Q.49. Find the value of the following.
$\sqrt{0.0025} \times \sqrt{2.25} \times \sqrt{0.0625}$
NTPC CBT - I 12/03/2021 (Morning)
(a) 0.01275 (b) 0.01245
(c) 0.01875 (d) 0.02255

Q.50. Simplify.
$\frac{1}{5.8} + \frac{1}{8.11} + \frac{1}{11.14} + \frac{1}{14.17}$
NTPC CBT - I 15/03/2021 (Morning)
(a) $\frac{24}{85}$ (b) $\frac{4}{17}$ (c) $\frac{4}{85}$ (d) $\frac{2}{85}$

Q.51. Find the value of
(0.00314)(0.0393)(0.0001)
NTPC CBT - I 01/04/2021 (Evening)
(a) (0.0314)(0.393)(0.0001).
(b) (0.0314)(0.00393)(0.0001).
(c) (0.00314)(0.00393)(0.0001)
(d) (0.314)(0.00393)(0.00001)

Q.52. The non-terminating repeating decimal among the following fractions is:
NTPC CBT - I 07/04/2021 (Morning)
(a) $\frac{13}{4}$ (b) $\frac{7}{5}$ (c) $\frac{3}{40}$ (d) $\frac{100}{11}$

Q.53. Which of the following rational numbers have a non-terminating decimal expansion ?
NTPC CBT - I 07/04/2021 (Evening)
(a) $\frac{11}{1000}$ (b) $\frac{23}{2^3 5^2}$ (c) $\frac{19}{2^3 5^2 7^5}$ (d) $\frac{4^2}{3^2 5^2}$

Q.54. Select the number that can replace both the instances of '*' in the following equation to make it correct.
$\left(\frac{*}{21}\right) \times \left(\frac{*}{189}\right) = 1$
NTPC CBT - I 07/04/2021 (Evening)
(a) 63 (b) 147 (c) 21 (d) 4848

Q.55. If 1.5 X = 0.05Y, then the value of $\frac{Y-X}{Y+X}$ is closest to:
NTPC CBT - I 08/04/2021 (Evening)
(a) 0.5 (b) 0.194 (c) 0.935 (d) 0.94

Q.56. The difference between $\frac{1}{3}$ and $\frac{1}{4}$ of a number is equal to its square root. Find the number.
RRB JE 23/05/2019 (Evening)
(a) 136 (b) 72 (c) 120 (d) 144

Q.57. Find the value of
$\frac{1}{1\times 2} + \frac{1}{2\times 3} + \frac{1}{3\times 4} + \frac{1}{4\times 5}$
$+ \frac{1}{5\times 6} + \_\_\_\_\_ + \frac{1}{9\times 10}$
RRB JE 24/05/2019 (Evening)
(a) $\frac{1}{10}$ (b) $\frac{9}{10}$ (c) $\frac{5}{11}$ (d) $\frac{2}{5}$

Q.58. If two-thirds of one quarter of a number is 32, then find the number.
RRB JE 26/06/2019 (Evening)
(a) 202 (b) 198 (c) 196 (d) 192

Q.59. A worker has to cut as many pieces as possible of length 5.25 m from a 50 m long steel rod. What part of this whole rod will be left (find in decimal fraction) ?
ALP Tier II 23/01/2019 (Afternoon)
(a) 0.02 (b) 0.05 (c) 0.04 (d) 0.03

Q.60. The sum of two fractions is $\frac{5}{6}$. One of them is $\frac{3}{4}$. What is the other fraction?
RRB ALP Tier - I 10/08/2018 (Morning)
(a) $\frac{2}{5}$ (b) $\frac{2}{2}$ (c) $\frac{1}{10}$ (d) $\frac{1}{12}$

Q.61. The square root of 5776 is:
RRB ALP Tier - I 14/08/2018 (Morning)
(a) 76 (b) 84 (c) 64 (d) 66

Q.62. The reciprocal of the value of 3 $\frac{1}{12} - [1 - \frac{3}{4} + \{2\frac{1}{2} - (1\frac{1}{2} - \frac{1}{3})\}]$ is.
RRB ALP Tier - I 29/08/2018 (Afternoon)
(a) 1 (b) 2 (c) 0 (d) $\frac{2}{3}$

Q.63. $\frac{1}{300}$ written as a recurring decimal is:
RRB ALP Tier - I 29/08/2018 (Evening)
(a) $0.000\overline{3}$ (b) $0.00\overline{3}$ (c) $0.0\overline{3}$ (d) $0.\overline{3}$

Q.64. x = 0.5747474, find the fractional value of x.
RPF Constable 17/01/2019 (Morning)
(a) 567/990 (b) 568/990
(c) 569/990 (d) 566/990

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.65. Convert 36 cm to km.
Group D 17/08/2022 (Morning)
(a) 0.00036 km (b) 0.0036 km
(c) 0.00063 k (d) 0.000036 km

Q.66. Which of the following options is the closest approximate value which will come in place of question mark (?) in the following equation ?
25.19 x 3 + 4.41 - 0.9 = ?
Group D 17/08/2022 (Morning)
(a) 100 (b) 95 (c) 78 (d) 79

Q.67. The value of 27 ÷ 3 - 27 x 0 + 1 =
Group D 17/08/2022 (Morning)
(a) 12 (b) -18 (c) 13 (d) 10

Q.68. The value of
0.6 + ($\sqrt{0.81}$ - ($\sqrt{0.0144}$ + 0.4 ÷ 0.5)) is:
Group D 17/08/2022 (Morning)
(a) 0.8 (b) 0.62 (c) 0.78 (d) 0.58

Q.69. 6124.8 × 625.5 × 0.0043 is equal in value to:
Group D 17/08/2022 (Afternoon)
(a) 61.248 x 6255 x 0.043
(b) 6.1248 x 62.55 x 0.43
(c) 612.48 x 625.5 x 0.43
(d) 6.1248 x 62.55 x 0.043

Q.70. Simplify: $(3^2)^3 + (2^3)^2$
Group D 17/08/2022 (Afternoon)
(a) 379 (b) 793 (c) 729 (d) 739

Q.71. If $2^x \times 4^{12} \times 8^3 = 16^{11}$, then the value of x is:
Group D 17/08/2022 (Evening)
(a) 14 (b) 12 (c) 11 (d) 13

Q.72. If $\frac{x}{y} = \frac{3}{2}$, then find $\frac{x^2+y^2}{x^2-y^2}$
Group D 17/08/2022 (Evening)
(a) $\frac{9}{5}$ (b) $\frac{11}{5}$ (c) $\frac{13}{5}$ (d) $\frac{7}{5}$

Q.73. 2.666...+ 2.77... in fraction form is:
Group D 18/08/2022 (Morning)
(a) $\frac{31}{9}$ (b) $\frac{47}{9}$ (c) $\frac{49}{9}$ (d) $\frac{29}{9}$

Q.74. The fraction equivalent to 0.474747... is :
Group D 18/08/2022 (Afternoon)
(a) $\frac{27}{9}$ (b) $\frac{27}{100}$ (c) $\frac{11}{27}$ (d) $\frac{47}{99}$

Q.75. If 10% of 24% of x is 240, then x = ?
Group D 18/08/2022 (Afternoon)
(a)100000 (b)10000 (c) 1000 (d) 100

Q.76. Which of the following options is the closest approximate value which will come in place of question mark (?) in the following equation ?
26.52 x 3.89 - 7.79 × 2 + 27.39 = ?
Group D 18/08/2022 (Afternoon)
(a) 136 (b) 82 (c) 119 (d) 181

Q.77. Simplify:
6 (x^3 - $2x^2$ + 3x) − (x^3 + 2x − 3).
Group D 18/08/2022 (Evening)
(a) $5x^3 - 12x^2 + 16x - 3$
(b) $5x^3 - 12x^2 + 16x + 3$
(c) $5x^3 + 12x^2 + 16x - 3$
(d) $5x^3 + 12x^2 + 16x + 3$

Q.78. Simplify $\frac{8^2 \times 3^3}{\sqrt{64} \times \sqrt{81}}$
Group D 18/08/2022 (Evening)
(a) 72 (b) 27 (c) 24 (d) 64

Q.79. Find the value of
325 x 5 + 31 x 21 - 22 x (63 - 52).
Group D 18/08/2022 (Evening)
(a) 2044 (b) 2024 (c) 2034 (d) 2014

Q.80. Simplify: $6^2 + 7^2 + \sqrt{16}$
Group D 22/08/2022 (Morning)
(a) 89 (b) 80 (c) 94 (d) 98

Q.81. Simplify $1.\overline{24}$ as an improper fraction.
Group D 22/08/2022 (Morning)
(a) $\frac{123}{90}$ (b) $\frac{41}{33}$ (c) $\frac{91}{90}$ (d) $\frac{124}{99}$

Q.82. The equivalent fraction of 4.2222 ... is:
Group D 22/08/2022 (Afternoon)
(a) $\frac{38}{100}$ (b) $\frac{38}{9}$ (c) $\frac{42}{99}$ (d) $\frac{422}{99}$

Q.83. Simplify
234 x [8 - (6 + 2) x 3] + 4234.

Group D 22/08/2022 (Afternoon)
(a) 490 (b) 423 (c) 940 (d) 324

Q.84. If $3^{(x-2)} + 3^x = 7290$, then the value of x is:
Group D 22/08/2022 (Evening)
(a) 8 (b) 9 (c) 6 (d) 7

Q.85. Simplify:
$\frac{3}{2}x^2 + 2x - \frac{3}{2} + \frac{x^2}{2} - 6x + \frac{1}{2}$.
Group D 22/08/2022 (Evening)
(a) $2x^2 - 4x + 1$ (b) $2x^2 + 4x + 1$
(c) $2x^2 - 4x - 1$ (d) $2x^2 + 4x - 1$

Q.86. Find the value of $\sqrt{\frac{0.030625}{0.001225}}$
Group D 22/08/2022 (Evening)
(a) 25 (b) 15 (c) 20 (d) 5

Q.87. The value of
$\sqrt{144} + \sqrt{0.0169} - \sqrt{4.41} = ?$
Group D 23/08/2022 (Morning)
(a) 15.4 (b) 10.03 (c) 14.23 (d) 11.2

Q.88. The value of
$(3^0 + 3^{-2} + 3^{-1}) \times 27 = ?$
Group D 23/08/2022 (Morning)
(a) 3 (b) 32 (c) 23 (d) 39

Q.89. Which of the following options is the closest approximate value which will come in place of question mark(?) in the following equation ?
$125.99 - 35.92 + 3.89 \times 16.11 = ?$
Group D 23/08/2022 (Morning)
(a) 158 (b) 166 (c) 154 (d) 150

Q.90. The value of $4^2 + \sqrt{8^2} - 4\sqrt{25} - 10 =$
Group D 23/08/2022 (Afternoon)
(a) - 6 (b) - 32 (c) 12 (d) - 25

Q.91. The value of $\sqrt{29\frac{4}{25}}$ is :
Group D 23/08/2022 (Afternoon)
(a) 5.4 (b) 5.5 (c) 5.6 (d) 5.2

Q.92. The value of
$\sqrt{729} + \sqrt{1681} + \sqrt{576} - \sqrt{1849}$ is :
Group D 23/08/2022 (Afternoon)
(a) 55 (b) 49 (c) 64 (d) 37

Q.93. Simplify $4\frac{7}{9} \times 7\frac{8}{9} \times 81 + 2\frac{3}{4}$
Group D 23/08/2022 (Evening)
(a) 3053.75 (b) 3053.25
(c) 3055.25 (d) 3055.75

Q.94. Find the value of the following:
$(\frac{-2}{5})^{-2} \times (\frac{-4}{5})^4$
Group D 23/08/2022 (Evening)
(a) $\frac{26}{25}$ (b) $\frac{25}{64}$ (c) $\frac{64}{25}$ (d) $\frac{25}{26}$

Q.95. Which of the following represents the closest approximate value that should come in place of the question mark (?) in the following equation ?
12.999 - 3.998 + 14.002 x 3.998 + 27.008 ÷ 3.001 + 35.999 ÷ 5.998 = ?
Group D 23/08/2022 (Evening)
(a) 68 (b) 89 (c) 72 (d) 80

Q.96. Simplify : $x^2 + 5x - 12 - 3(x^2 - 2x + 9)$
Group D 23/08/2022 (Evening)
(a) $-2x^2 + 11x + 39$ (b) $2x^2 - 11x - 39$
(c) $-2x^2 + 11x - 39$ (d) $2x^2 + 11x - 39$

Q.97. Express $0.2\overline{7}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.
Group D 24/08/2022 (Morning)
(a) $\frac{5}{18}$ (b) $\frac{18}{7}$ (c) $\frac{7}{18}$ (d) $\frac{18}{5}$

Q.98. Simplify $\frac{423 \times 423 - 325 \times 325}{423 - 325}$
Group D 24/08/2022 (Morning)
(a) 748 (b) 487 (c) 478 (d) 874

Q.99. Which of the following options is the closest approximate value which will come in place of question mark (?) in the following equation ?
Group D 24/08/2022 (Morning)
68.27 - 140.1 + 9.99 x 7.7 = ?
(a) 8 (b) 35 (c) 16 (d) 25

Q.100. The value of 12 + 12 x 12 - 12 ÷ 12 =
Group D 24/08/2022 (Morning)
(a) 23 (b) 140 (c) 155 (d) 0

Q.101. Simplify: $(\frac{2}{3} + \frac{1}{3}) \times 23 - 13 + 6$
Group D 24/08/2022 (Afternoon)
(a) 23 (b) 10 (c) 29 (d) 16

Q.102. Simplify $\sqrt{625} - \sqrt{324} + 33^2$.
Group D 24/08/2022 (Evening)
(a) 1609 (b) 1906 (c) 1096 (d) 1069

Q.103. The value of $\sqrt{1234321} = ?$
Group D 24/08/2022 (Evening)
(a) 1111 (b) 121 (c) 139 (d) 1219

Q.104. The value of $\frac{2}{3} + \frac{1}{1 + \frac{4}{5}} - \frac{5}{6}$ is:
Group D 25/08/2022 (Morning)
(a) $\frac{5}{18}$ (b) $\frac{13}{18}$ (c) $\frac{7}{18}$ (d) $\frac{11}{18}$

Q.105. Five-fourths of a number is greater than three-fourths of the number by 6. Find the number.
Group D 25/08/2022 (Morning)
(a) 10 (b) 14 (c) 12 (d) 8

Q.106. Simplify $\sqrt{729} - \sqrt{400}$
Group D 25/08/2022 (Afternoon)
(a) 6 (b) 8 (c) 5 (d) 7

Q.107. Simplify:
$(1.5a^2 - 2.5b^2)(1.5a^2 + 2.5b^2) + 6.25ab$
Group D 25/08/2022 (Afternoon)
(a) $2.25^4 - 6.25b^4$
(b) $2.25a^4 - 6.5b^4 + 6.25ab$
(c) $2.5a^4 - 6.25b^4 + 6.25ab$
(d) $2.25a^4 - 6.25b^4 + 6.25ab$

Q.108. Which vulgar fraction is equal in value to the mixed recurring decimal 0.3125125125...?
Group D 25/08/2022 (Evening)
(a) $\frac{1783}{4995}$ (b) $\frac{1653}{4995}$ (c) $\frac{1967}{4995}$ (d) $\frac{1561}{4995}$

Q.109. Find the value of
$\frac{\sqrt{729}}{15} \times \frac{25}{\sqrt{81}} \times \frac{15}{\sqrt{225}}$.
Group D 25/08/2022 (Evening)
(a) 5 (b) 2 (c) 4 (d) 3

Q.110. What approximate value should come in place of the question mark(?) in the followin Equation ?
$126.012 \times 14.987 - 603.045 = ?$
+ 261.987
Group D 25/08/2022 (Evening)
(a) 845 (b) 1235 (c) 875 (d) 1025

Q.111. If $25x^3 = 1600$, then which of the following is a possible value of x ?
Group D 26/08/2022 (Morning)
(a) 5 (b) 3 (c) 4 (d) 2

Q.112. If $5 \times 7 - [23 - \{35 - (20 - x)\}] = 42$, then find the value of x.
Group D 26/08/2022 (Afternoon)
(a) -15 (b) 15 (c) 17 (d) -17

Q.113. Which of the following represents the closest approximate value that should come in place of the question mark (?) in the following equation?
$(\sqrt{530} + 85 \div 24 \times 4 - \sqrt{255}) \div 3 = ?$
Group D 26/08/2022 (Afternoon)
(a) 7 (b) 15 (c) 4 (d) 1

Q.114. Express $0.4\overline{32}$ in the form of $\frac{p}{q}$, where p and q are integers, and $q \neq 0$.
Group D 26/08/2022 (Afternoon)
(a) $\frac{465}{173}$ (b) $\frac{214}{495}$ (c) $\frac{173}{465}$ (d) $\frac{495}{214}$

Q.115. If one third of a number is 4 less than the number itself, find the number.
Group D 26/08/2022 (Afternoon)
(a) 4 (b) 5 (c) 6 (d) 3

Q.116. $0.13\overline{241}$ in the form of $\frac{p}{q}$, where p and q are integers, and $q \neq 0$.
Group D 26/08/2022 (Evening)

(a) $\frac{3287}{21780}$ (b) $\frac{3807}{24975}$
(c) $\frac{3337}{34160}$ (d) $\frac{3307}{24975}$

Q.117. What approximate value should come in place of the question mark (?) in the following equation ?
99.01 ÷ 10.93 + 6.987 × 16.01 = ?
Group D 26/08/2022 (Evening)
(a) 133 (b) 129 (c) 121 (d) 145

Q.118. Find the remainder when 171 × 172 × 173 is divided by 17.
Group D 26/08/2022 (Evening)
(a) 9 (b) 7 (c) 8 (d) 6

Q.119. Solve :
$3(5x^2 - 7) - 5(3x^2 + 2x - 7) = -16$
Group D 26/08/2022 (Evening)
(a) 4 (b) 5 (c) 3 (d) 2

Q.120. The value of
$\{(234^5 - 243^8 + \frac{1}{72})^{-8}\}^0 + 8 =$
Group D 29/08/2022 (Morning)
(a) 234 (b) 9 (c) 243 (d) 10

Q.121. The value of
$\frac{1}{4} + \frac{2}{5} \div [\{2\frac{1}{5} - 2\} \times 5] - \frac{2}{3} \times \frac{3}{5}$ is :
Group D 29/08/2022 (Morning)
(a) $\frac{3}{5}$ (b) $\frac{2}{3}$ (c) $\frac{1}{4}$ (d) $\frac{5}{6}$

Q.122. The fraction equivalent to 0.4363636..... is:
Group D 29/08/2022 (Morning)
(a) $\frac{24}{55}$ (b) $\frac{236}{99}$ (c) $\frac{42}{99}$ (d) $\frac{42}{100}$

Q.123. Subtract the sum of 2x - 3y + 7z and 4z - 5x from 12x - z
Group D 29/08/2022 (Morning)
(a)15x + 3y - 12z (b) 1x + 12y - 12z
(c) 3x + 3y - 32 (d) 4x + 7y

Q.124. Find the value of $\sqrt{9604}$.
Group D 29/08/2022 (Afternoon)
(a) 74 (b) 98 (c) 89 (d) 72

Q.125. The value of $\frac{3}{7} + \frac{2}{7} + \frac{1}{14} + \frac{2}{7} - 3$
Group D 29/08/2022 (Afternoon)
(a) $\frac{27}{14}$ (b) $-\frac{27}{14}$ (c) $\frac{13}{14}$ (d) $-\frac{13}{14}$

Q.126. The value of
$\frac{0.2 \times 0.2 \times 0.2 - 0.02 \times 0.02 \times 0.02}{2 \times 2 \times 2}$ =
Group D 29/08/2022 (Afternoon)
(a) 0.0090 (b) 0.000999
(c) 0.999 (d) 0.00999

Q.127. Simplify :
$x(2x - 5) + 6(x^2 - 4) + 18$
Group D 29/08/2022 (Afternoon)
(a) $8x^2 + 5x + 6$ (b) $8x^2 + 5x - 6$
(c) $8x^2 - 5x + 6$ (d) $8x^2 - 5x - 6$

Q.128. Simplify : 9991×10009
Group D 29/08/2022 (Afternoon)
(a) 91,999,919 (b) 99,999,19
(c) 99,999,919 (d) 99,999,99

Q.129. Simplify:
$2(\frac{3}{2}x^2 - 24x + 12) - 3(x^2 + 4x - 13)$.
Group D 29/08/2022 (Evening)
(a) - 60x + 63 (b) 60x - 63
(c) 60x + 63 (d) - 60x - 63

Q.130. Which of the following options is the closest approximate value which will come in place of question mark(?) in the following equation ?
$(\sqrt{142} + 52 \div 26 \times 5 - \sqrt{80}) \times 2 = ?$
Group D 29/08/2022 (Evening)
(a) 32 (b) 30 (c) 26 (d) 20

Q.131. 7.44 ... + 3.77 ... - 2.55 ... =
Group D 29/08/2022 (Evening)
(a) $\frac{78}{9}$ (b) $\frac{83}{9}$ (c) $\frac{124}{9}$ (d) $\frac{74}{9}$

Q.132. Simplify $\frac{2.46 \times 2.46 - 1.46 \times 1.46}{2.46 - 1.46}$
, giving your answer as a fraction.
Group D 30/08/2022 (Morning)
(a) $\frac{392}{10}$ (b) $\frac{392}{10000}$ (c) $\frac{392}{1000}$ (d) $\frac{392}{100}$

Q.133. The value of
(18 ÷ 9) x (- 7 + 9) - 7 x 2 = ?
Group D 30/08/2022 (Morning)
(a) -10 (b) -13 (c) -6 (d) -12

Q.134. The Value of
$\frac{0.5 \times 10.6 - 0.2 \times 1.4}{0.4}$
Group D 30/08/2022 (Afternoon)
(a) 12.25 (b) 12.55 (c) 1.255 (d) 125.5

Q.135. The value of 121.12 x 0.121 is:
Group D 30/08/2022 (Evening)
(a) 14.65552 (b) 1.465552
(c) 1465.552 (d) 146.5552

Q.136. Simplify:
$x^3 - 3x^2 + 9x - 12 - x^3 - 7x^2 - 8x - 16$.
Group D 30/08/2022 (Evening)
(a) 10 x^2 + x - 28 (b) -10 x^2 + x + 28
(c) -10 x^2 + x - 28 (d) 10x^2 - x - 28

Q.137. The value of $\sqrt{1.0201}$ = ?
Group D 30/08/2022 (Evening)
(a) 10.1 (b) 1.02 (c) 1.01 (d) 101

Q.138. Simplify:
$3(9x^3 - 6x^2 + 30) - 9(3x^3 - 2x + 30)$
Group D 01/09/2022 (Morning)
(a) 18(x^2 + x + 10) (b) 18(x^2 + x - 10)
(c) -18(x^2 - x + 10) (d) 18(x^2 + x - 18)

Q.139. The value of
$(\frac{-5}{3}) \times (\frac{9}{25}) + (\frac{1}{5} - 2) = ?$
Group D 01/09/2022 (Morning)
(a) $\frac{-4}{5}$ (b) $\frac{-12}{5}$ (c) 0 (d) $\frac{9}{5}$

Q.140. Simplify $2^3 \times 3^2 \times 7$.
Group D 01/09/2022 (Afternoon)
(a) 702 (b) 504 (c) 506 (d) 603

Q.141. The simplified value of
$\frac{(0.11)^2 + (0.06)^2 + (0.031)^2}{(0.011)^2 + (0.006)^2 + (0.0031)^2}$ iss:
Group D 01/09/2022 (Evening)
(a) 10 (b) 1 (c) 1000 (d) 100

Q.142. The positive square root of ($34^2 - 16^2$) is:
Group D 02/09/2022 (Morning)
(a) 60 (b) 40 (c) 30 (d) 50

Q.143. Simplify the given expression.
$(13^2 - 5^2)^{\frac{3}{2}} \times 8^{\frac{2}{3}} \div (\frac{1}{6})^{-3}$
Group D 02/09/2022 (Morning)
(a)12 (b) 24 (c) 32 (d) 16

Q.144. Express 0.7 $\overline{94}$ + 0.8 $\overline{76}$ in the form $\frac{p}{q}$, where p and q are integers and q # 0.
Group D 02/09/2022 (Morning)
(a) $1\frac{676}{990}$ (b) $1\frac{15}{22}$ (c) $1\frac{133}{198}$ (d) $1\frac{37}{55}$

Q.145. The expression
$\frac{1+x}{1-x} - \frac{1-x}{1+x} + \frac{4x}{1+x^2} + \frac{8x^3}{1-x^4}$
is equal to :
Group D 02/09/2022 (Afternoon)
(a) $\frac{4x}{1-x^2}$ (b) $\frac{8x}{1+x^2}$
(c) $\frac{4x}{1+x^2}$ (d) $\frac{8x}{1-x^2}$

Q.146. The value of $\sqrt{74529}$ is :
Group D 02/09/2022 (Evening)
(a) 239 (b) 243 (c) 273 (d) 259

Q.147. If a = 5, then
$\sqrt{(4a^2 - 4a + 1)} + 6a$ is
Group D 02/09/2022 (Evening)
(a) 69 (b) 59 (c) 49 (d) 39

Q.148. The value of
$(\frac{64}{25})^{-\frac{3}{2}} \times (\frac{2}{5})^4 \div \sqrt[5]{(32)^{-3}}$ is:
Group D 05/09/2022 (Morning)

(a) $\frac{8}{25}$ (b) $\frac{1}{20}$ (c) $\frac{1}{5}$ (d) $\frac{2}{5}$

Q.149. The value of $\frac{1\frac{2}{3}+2\frac{1}{2}\times\frac{2}{3}}{5-4\frac{1}{2}\div\frac{3}{2}}$ is:
Group D 05/09/2022 (Afternoon)
(a) $3\frac{1}{3}$ (b) $1\frac{2}{3}$ (c) $2\frac{1}{3}$ (d) $4\frac{2}{3}$

Q.150. Express $0.9\overline{87}$ - $0.7\overline{56}$ in the form $\frac{p}{q}$, where p and q are integers and q ≠0.
Group D 05/09/2022 (Evening)
(a) $\frac{88}{165}$ (b $\frac{164}{495}$ (c) $\frac{229}{990}$ (d) $\frac{219}{495}$

Q.151. Simplify the given expression.
$\frac{3-5x^2}{1-x^3}+\frac{1}{1-x}-\frac{5x+4}{1+x+x^2}$
Group D 05/09/2022 (Evening)
(a) $\frac{x}{1-x^3}$ (b) $\frac{2x^2}{1-x^3}$
(c) $\frac{x^2}{1-x^3}$ (d) $\frac{2x}{1-x^3}$

Q.152. Simplify the given expression.
$(\frac{8}{125})^{\frac{2}{3}}\times(\frac{27}{64})^{-\frac{2}{3}}\div(\frac{5}{4})^{-2}$
Group D 05/09/2022 (Evening)
(a) $\frac{4}{9}$ (b) $\frac{2}{3}$ (c) $\frac{3}{5}$ (d) $\frac{3}{8}$

Q.153. Convert 25 grams to kilograms and express the answer in the form of a fraction.
Group D 06/09/2022 (Morning)
(a) $\frac{1}{4}$ kg (b) $\frac{1}{4000}$ kg
(c) $\frac{1}{400}$kg (d) $\frac{1}{40}$ kg

Q.154. Express $4.5\overline{67}$ in the form of $\frac{P}{Q}$, where p and q are integers, and q≠0.
Group D 06/09/2022 (Morning)
(a) $4\frac{281}{495}$ (b) $4\frac{63}{110}$ (c) $4\frac{94}{165}$ (d) $4\frac{283}{495}$

Q.155. If $(\frac{512}{125})^3\times(\frac{512}{125})^k=(\frac{8}{5})^{15}$, then find the value of k.
Group D 06/09/2022 (Afternoon)
(a) -1 (b) 3 (c) -2 (d) 2

Q.156. Which of the following represents the closest approximate value that should come in place of the question mark (?) in the following equation?
√1025 + 98 ÷ 14 × 4 - √170 = ?
Group D 06/09/2022 (Afternoon)
(a) 47 (b) 60 (c) 70 (d) 27

Q.157. Express $7.8\overline{964}$ in the $\frac{a}{b}$ form, where p and q are integers, and q ≠ 0.
Group D 06/09/2022 (Evening)
(a) $7\frac{166}{185}$ (b) $7\frac{996}{1111}$
(c) $7\frac{4478}{4995}$ (d) $7\frac{8956}{9999}$

Q.158. Find the value of
$\frac{183\times183\times183-73\times73\times73}{183\times183+183\times73+73\times73}$.
Group D 06/09/2022 (Evening)
(a) 210 (b) 110 (c) 256 (d) 136

Q.159. Express $0.3\overline{59}$ in the form $\frac{p}{q}$, where p and q are integers and q ≠0.
Group D 08/09/2022 (Morning)
(a) $\frac{178}{495}$ (b) $\frac{359}{990}$ (c) $\frac{119}{330}$ (d) $\frac{179}{495}$

Q.160. The value of $\frac{(9.8\times9.8-5.8\times5.8)}{2\times(7.8)}$ is:
Group D 08/09/2022 (Afternoon)
(a) 4 (b) 6 (c) 3 (d) 5

Q.161. The value of
$5\sqrt{6}-\sqrt{[3(4-2)]}+(\frac{12}{\sqrt{6}})$ is:
Group D 08/09/2022 (Evening)
(a) $8\sqrt{6}$ (b) $7\sqrt{6}$ (c) $5\sqrt{6}$ (d) $6\sqrt{6}$

Q.162. The value of
$\sqrt{625}+\sqrt{0.25}-\sqrt{0.000025}$ is:
Group D 08/09/2022 (Evening)
(a) 25.405 (b) 25.5 (c) 25.395 (d) 25.495

Q.163. The value of 39 ÷ {6 × ($\frac{6}{7}$ of $\frac{7}{8}$)} is:
Group D 09/09/2022 (Morning)
(a) $\frac{25}{3}$ (b) $\frac{28}{3}$ (c)$\frac{26}{3}$ (d) $\frac{23}{3}$

Q.164. The value of
(0.1 x 0.001 × 0.0001 × 10^6) is:
Group D 09/09/2022 (Morning)
(a) 1 (b) $\frac{1}{10}$ (c) 100 (d) $\frac{1}{100}$

Q.165. If 9x = 55^2-35^2,then the value of x is:
Group D 09/09/2022 (Morning)
(a) 400 (b) 200 (c) 300 (d) 500

Q.166. Express $0.4\overline{35}$ in the form $\frac{p}{q}$, where p and q are integers and q≠0.
Group D 09/09/2022 (Afternoon)
(a) $\frac{456}{991}$ (b) $\frac{425}{990}$ (c) $\frac{431}{990}$ (d) $\frac{430}{991}$

Q.167. The value of (279 ÷ 31) + (363 ÷ 33) - (512 ÷ 16) is:
Group D 09/09/2022 (Afternoon)
(a) 1.9 (b) -11 (c) 10 (d) -12

Q.168. If $\sqrt{(1-\frac{99}{2500})}=\frac{49}{\sqrt{x}}$ then then value of x is:
Group D 09/09/2022 (Afternoon)
(a) 49 (b) 2500 (c) 2401 (d) 50

Q.169. Express $0.1\overline{7}$ in the form $\frac{p}{q}$, where p and q are integers and q ≠ 0.
Group D 09/09/2022 (Evening)
(a) $\frac{7}{45}$ (b) $\frac{6}{49}$ (c) $\frac{8}{45}$ (d) $\frac{5}{49}$

Q.170. The value of $(2^{25}\div2^{15})\times2^4$ is:
Group D 12/09/2022 (Morning)
(a) 2^{14} (b) 2^{10} (c) 2^{11} (d) 2^{13}

Q.171. The value of
{14 + ($2\frac{4}{5}$ + 1)} × $\frac{1}{100}$ is:
Group D 12/09/2022 (Morning)
(a) 0.0183 (b) 0.183 (c) 1.83 (d) 18.3

Q.172.
The value of $\frac{9}{10}\div(\frac{4}{5}+\frac{1}{10})$ is :
Group D 12/09/2022 (Afternoon)
(a) 0 (b) 1 (c) $\frac{1}{10}$ (d $\frac{81}{100}$

Q.173. Express $0.\overline{3}$ in the form $\frac{p}{q}$, where p and q are integers and q ≠ 0
Group D 12/09/2022 (Evening
(a) $\frac{2}{3}$ (b) $\frac{2}{5}$ (c) $\frac{3}{4}$ (d) $\frac{1}{3}$

Q.174. The value of 597 × 603 is:
Group D 13/09/2022 (Morning)
(a) 559991 (b) 659991
(c) 359991 (d) 459991

Q.175. What is the value of
222.22 + 22.22 + 12 + 0.22 + 0.02 ?
Group D 13/09/2022 (Morning)
(a) 256.08 (b) 256.86
(c) 255.68 (d) 256.68

Q.176. What is the value of
$5^5\times125^{\frac{-2}{3}}\times(25)^{\frac{-1}{2}}$?
Group D 13/09/2022 (Afternoon)
(a) $\frac{1}{25}$ (b) $\frac{1}{5}$ (c) 5 (d) 25

Q.177. Simplify $\frac{12^3\times6^2\times8}{4^5\times3^5}$
Group D 13/09/2022 (Afternoon)
(a) 8 (b) 4 (c) 1 (d) 2

Q.178. $(34)^3$ is equal to:
Group D 13/09/2022 (Afternoon)
(a) 39304 (b) 39204 (c) 40304 (d) 29304

Q.179. If 1.5x = 0.02y, then the value of $\frac{1}{\left(\frac{y+x}{y-x}\right)}$ is _____.
Group D 13/09/2022 (Afternoon)
(a) $\frac{38}{37}$ (b) $\frac{370}{38}$ (c) $\frac{37}{38}$ (d) $\frac{37}{380}$

Q.180. The correct expression of $8.\overline{46}$ in the fractional form is_____.
Group D 13/09/2022 (Evening)
(a) $\frac{846}{99}$ (b) $\frac{838}{99}$ (c) $\frac{83}{99}$ (d) $\frac{84}{99}$

Q.181. The value of $\sqrt{0.04}$ + $\sqrt{6.25}$ + $\sqrt{12.25}$ − 8.2 is ____.
Group D 14/09/2022 (Morning)
(a) −2.2 (b) −2 (c) 2.2 (d) 2

Q.182. The value of $(625)^{-\frac{1}{2}}$ is _____.
Group D 14/09/2022 (Afternoon)
(a) 2.5 (b) 25 (c) 0.04 (d) 0.25

Q.183. The value of $\sqrt{190 + \sqrt{11 + \sqrt{617 + 8}}}$ is _____.
Group D 14/09/2022 (Afternoon)
(a) 14 (b) 12 (c) 13 (d) 16

Q.184. Evaluate $0.\overline{696} \times 0.\overline{27}$
Group D 14/09/2022 (Evening)
(a) $\frac{2085}{10989}$ (b) $\frac{2088}{10989}$
(c) $\frac{2083}{10989}$ (d) $\frac{2087}{10989}$

Q.185. Evaluate 9.46 $\overline{7}$ - 2.46 $\overline{7}$ + 4.46 $\overline{7}$.
Group D 15/09/2022 (Morning)
(a) $\frac{10521}{1100}$ (b) $\frac{10521}{900}$
(c) $\frac{10321}{900}$ (d) $\frac{10321}{1100}$

Q.186. The value of [[(0.413) ÷(0.00413)] - 74.27 - 25.72] is_____.
Group D 15/09/2022 (Afternoon)
(a) 0.01 (b) 0 (c) 1 (d) 0.1

Q.187. The value of $\sqrt{1225}$ + $\sqrt{6.25}$ + $\sqrt{12.25}$ - 8 is_____.
Group D 15/09/2022 (Afternoon)
(a) 33 (b) 0.75 (c) 50 (d) 0.16

Q.188. Simplify:
25 - [7 + 7 of (33 - 4 × 23)].
Group D 15/09/2022 (Afternoon)
(a) 431 (b) - 4651 (c) - 395 (d) - 9313

Q.189. Evaluate $\frac{1}{\frac{4}{5}+\frac{3}{7}} . \div \frac{8}{35}$
Group D 15/09/2022 (Evening)
(a) $3\frac{193}{344}$ (b) $3\frac{191}{344}$
(c) $3\frac{197}{344}$ (d) $3\frac{199}{344}$

Q.190. Find the value of $3^{-5} \times 4^{-5} \times 5^{-5}$.
Group D 16/09/2022 (Morning)
(a) $\frac{1}{30^5}$ (b) $\frac{1}{50^5}$ (c) $\frac{1}{60^5}$ (d) $\frac{1}{40^5}$

Q.191. If 5^{n+2} = 3125, then n =_____.
Group D 16/09/2022 (Morning)
(a) 5 (b) 4 (c) 3 (d) 2

Q.192. The value of $\frac{\sqrt{1296}}{\sqrt{121}} \times \frac{15}{(216)^{\frac{1}{3}}} \times \frac{11}{\sqrt{225}}$ is ____.
Group D 16/09/2022 (Morning)
(a) 36 (b) 6 (c) 11 (d) 15

Q.193. Find the value of
$[(\frac{5}{8})^{-7} \times (\frac{8}{5})^{-4} \times (\frac{1}{4})^{-3}]^{-3}$
Group D 16/09/2022 (Afternoon)
(a) $(\frac{5}{4})^7$ (b) $(\frac{5}{4})^9$ (c) $(\frac{32}{5})^9$ (d) $(\frac{5}{32})^9$

Q.194. Simplify $(4pq + 3q)^2 - (4pq - 3q)^2$.
Group D 16/09/2022 (Afternoon)
(a) $24p^2q^2$ (b) $48p^2q^2$ (c) $24pq^2$ (d) $48pq^2$

Q.195. Find the value of
$(\frac{1}{2})^{-2} + (\frac{1}{3})^{-2} + (\frac{1}{4})^{-2}$
Group D 16/09/2022 (Afternoon)
(a) 29 (b) 25 (c) 21 (d) 13

Q.196. Which of the following optious is the closest approximate value which will come in place of question mark(?) in the following equation ?
11.96 + 4.96 + 12.16 - 11.89 × 2.04 = ?
Group D 16/09/2022 (Afternoon)
(a) 7 (b) 9 (c) 13 (d) 5

Q.197. Convert $\frac{23}{11}$ to its recurring decimal form.
Group D 16/09/2022 (Evening)
(a) $2.\overline{32}$ (b) $2.\overline{09}$ (c) $2.\overline{23}$ (d) $2.\overline{18}$

Q.198. $(\frac{25}{9})^{x+1}(\frac{81}{625})^{x-1} = \frac{9}{25}$, then find the value of x.
Group D 16/09/2022 (Evening)
(a) 8 (b) 6 (c) 5 (d) 4

Q.199. The value of $(6 - 3) \div [(9 - 6) \div \{(6 - 4) \div (2 + \frac{8}{13})\}]$ is.
Group D 16/09/2022 (Evening)
(a) $\frac{1}{17}$ (b) $\frac{13}{17}$ (c) $\frac{26}{17}$ (d) $\frac{5}{17}$

Q.200. If 5^{x+y} = 125 and 5^{x-y} = 3125, then the value of Y is :
Group D 17/09/2022 (Morning)
(a) −4 (b) −3 (c) −1 (d) −2

Q.201. The value of
$20 - [12 - \{14 - (12 - \overline{16 - 10})\}]$ is:
Group D 17/09/2022 (Morning)
(a) 8 (b) 10 (c) 16 (d) 20

Q.202. Express $0.5\overline{323}$ in the form, $\frac{P}{Q}$ where p and q are integers and q ≠ 0.
Group D 17/09/2022 (Morning)
(a) $\frac{5323}{9990}$ (b) $\frac{2661}{4990}$ (c) $\frac{2659}{4995}$ (d) $\frac{5333}{9990}$

Q.203. Express $0.\overline{64}$ in the form $\frac{p}{q}$, where p and q are integers and q≠0.
Group D 17/09/2022 (Afternoon)
(a) $\frac{7}{9}$ (b) $\frac{9}{11}$ (c) $\frac{67}{95}$ (d) $\frac{64}{99}$

Q.204. Which of the following fractions is the largest?
$\frac{5}{7}, \frac{9}{14}, \frac{16}{21}, \frac{29}{42}$
Group D 17/09/2022 (Afternoon)
(a) $\frac{16}{21}$ (b) $\frac{29}{42}$ (c) $\frac{5}{7}$ (d) $\frac{9}{14}$

Q.205. The difference between the smallest and the largest fractions among $\frac{5}{6}, \frac{7}{8}, \frac{11}{12}, \frac{13}{16}$ is :
Group D 17/09/2022 (Afternoon)
(a) $\frac{5}{41}$ (b) $\frac{5}{47}$ (c) $\frac{5}{43}$ (d) $\frac{5}{48}$

Q.206. The value of 3 + 3 x [{11 − 2 } ÷ 3] − 2 × 3 is
Group D 17/09/2022 (Evening)
(a) 7 (b) 6 (c) 8 (d) 9

Q.207. Find the value of
$[(12 \div 4) \times \{\frac{12}{3} + \frac{5}{3} \times (7 - 4)\}]$
Group D 17/09/2022 (Evening)
(a) 54 (b) 45 (c) 27 (d) 36

Q.208. Using the fact that 4515 ÷12.9 = 350, find the value of 4.515 + 12.9?
Group D 17/09/2022 (Evening)
(a) 3.5 (b) 0.035 (c) 35 (d) 0.35

Q.209. Evaluate $23^3 + (-11)^3 + (-12)^3$
Group D 17/09/2022 (Evening)
(a) 8708 (b) 8908 (c) 9108 (d) 8608

Q.210. Evaluate:
$\frac{(40.25 \div 5) + (0.07 \times 5)}{(0.15 \times 8) + (0.18 \div 0.2)}$
Group D 18/09/2022 (Morning)
(a) 3 (b) 5 (c) 4 (d) 7.5

Q.211. Using the fact that $\sqrt{18496}$ = 136 , find the value of $\sqrt{184.96} - \sqrt{1.8496}$.
Group D 18/09/2022 (Morning)

(a) 12.24 (b) 18.49 (c) 10 (d) 14.96

Q.212. The value of 60% of 28% of 250 = _____.
Group D 18/09/2022 (Afternoon)
(a) 42 (b) 56 (c) 22 (d) 68

Q.213. Find the value of $4^{-5} \div 4^{7} \times 4^{-6}$
Group D 18/09/2022 (Afternoon)
(a) 4^{-18} (b) 4^{-20} (c) 4^{-16} (d) 4^{-14}

Q.214. Find the value of [$(12 \div \frac{4}{3})$ x $\{6 \div 4 \times (\frac{12-7}{6})\} \div \{4 \times 6 \div 3\}$]
Group D 18/09/2022 (Afternoon)
(a) $1\frac{15}{32}$ (b) $1\frac{11}{32}$ (c) $1\frac{13}{32}$ (d) $1\frac{17}{32}$

Q.215. The value of $4^2 - 3\,(8)^{\frac{2}{3}} + (\frac{16}{9})^{\frac{1}{2}}$
Group D 18/09/2022 (Afternoon)
(a) 1 (b) 0 (c) $3\frac{1}{3}$ (d) $5\frac{1}{3}$

Q.216. The value of 2405 ÷ 13 × 6 + 35 is:
Group D 18/09/2022 (Evening)
(a) 1035 (b) 1305 (c) 1235 (d) 1145

Q.217. Convert $0.2\overline{6}$ into a proper fraction.
Group D 18/09/2022 (Evening)
(a) $\frac{5}{17}$ (b) $\frac{7}{33}$ (c) $\frac{8}{21}$ (d) $\frac{4}{15}$

Q.218. The value of $16^3 - 12^3$ is:
Group D 18/09/2022 (Evening)
(a) 2388 (b) 2368 (c) 2378 (d) 2358

Q.219. What is $6^0 \times 4^2 \times 2^{-4}$?
Group D 18/09/2022 (Evening)
(a) 2 (b) 4 (c) 0 (d) 1

Q.220. Evaluate
$\frac{.1 \times .1 \times .1 + .02 \times .02 \times .02}{.2 \times .2 \times .2 + .04 \times .04 \times .04}$
Group D 18/09/2022 (Evening)
(a) 0.0125 (b) 0.25 (c) 0.5 (d) 0.125

Q.221. Which of the following options is the closest approximate value which will come in place of question mark(?) in the following equation?
7.98 × 2 + 3.96 × 6 -18 ÷ 2 + 1 = ?
Group D 18/09/2022 (Evening)
(a) 25 (b) 36 (c) 32 (d) 40

Q.222. Simplify the given expression.
$11.45\overline{65} \div 2.\overline{67}$
Group D 19/09/2022 (Morning)
(a) $4\frac{2}{25}$ (b) $3\frac{7}{25}$ (c) $4\frac{7}{25}$ (d) $3\frac{4}{25}$

Q.223. The value of $0.8\overline{7}$ is _____.
Group D 19/09/2022 (Morning)
(a) $\frac{87}{9}$ (b) $\frac{79}{90}$ (c) $\frac{7}{90}$ (d) $\frac{8}{90}$

Q.224. The value of
$216^{\frac{2}{3}} + \frac{1}{256^{\frac{-3}{4}}} + 32^{\frac{1}{5}} - \frac{1}{10^{-2}} - 2$ is ____.
Group D 19/09/2022 (Afternoon)
(a) −1 (b) −2 (c) 0 (d) 1

Q.225. The value of $326.\overline{786} - 10.19\overline{3}$ is:
Group D 19/09/2022 (Afternoon)
(a) $316.65\overline{345}$ (b) $316.49\overline{575}$
(c) $316.50\overline{365}$ (d) $316.59\overline{345}$

Q.226. The product of (x - 5) and (x + 3) is:
Group D 19/09/2022 (Afternoon)
(a) x^2- 2x -15 (b) x^2+ 2x +15
(c) x^2+ 3x -15 (d) x^2+ 3x +15

Q.227. If m = - 9 and n = 13, find the value of 25 m² + 40mn + $16n^2$.
Group D 19/09/2022 (Evening)
(a) 64 (b) 49 (c) 81 (d) 100

Q.228. The number $0.3\overline{35}$ can be represented in the form of $\frac{p}{Q}$ (where P and Q are natural numbers) as:
Group D 19/09/2022 (Evening)
(a) $\frac{332}{895}$ (b) $\frac{332}{990}$ (c) $\frac{332}{995}$ (d) $\frac{332}{980}$

Q.229. The expression $(3.7)^3 - 3 \times (3.7)^2 \times (0.7) + 3 \times (3.7) \times (0.7)^2 - (0.7)^3$ is equal to:
Group D 19/09/2022 (Evening)
(a) 30 (b) 27 (c) 35 (d) 10

Q.230. The value of
$40 - [3 - \{4 - (6 - \overline{6 - 4})\}]$ is_____.
Group D 19/09/2022 (Evening)
(a) 47 (b) 100 (c) 300 (d) 37

Q.231. If $\sqrt{21} = 4.58$, then the value of $\sqrt{\frac{7}{3}}$, correct or 3 decimal places is:
Group D 20/09/2022 (Morning)
(a) 1.520 (b) 1.521 (c) 1.523 (d) 1.527

Q.232. What is the smallest positive fraction that must be added to the fraction $\frac{3}{5} \times \frac{16}{21} \times \frac{7}{10} \times \frac{3}{4}$ to make it a whole mumber ?
Group D 20/09/2022 (Morning)
(a) $\frac{20}{5}$ (b) $\frac{19}{25}$ (c) $\frac{23}{2}$ (d) $\frac{19}{16}$

Q.233. $If\ \frac{y}{x} = \frac{5}{6}$, then $\frac{x^2 - y^2}{x^2 + y^2}$ = _____.
Group D 20/09/2022 (Afternoon)
(a) $\frac{25}{36}$ (b) $\frac{11}{61}$ (c) $\frac{9}{61}$ (d) $\frac{36}{25}$

Q.234. If $\sqrt{6}$ = 2.45, then the value of $\sqrt{6} + \sqrt{24} + \sqrt{54}$ is :
Group D 20/09/2022 (Afternoon)
(a) 13.75 (b) 15.75 (c) 15.70 (d) 14.70

Q.235. Express $123.4\overline{7}$ in $\frac{p}{q}$ form, where p and q are integers and $q \neq 0$.
Group D 20/09/2022 (Evening)
(a) $\frac{12347}{99}$ (b) $\frac{11113}{90}$
(c) $\frac{12347}{90}$ (d) $\frac{11113}{9}$

Q.236. What is the smallest natural number that must be added to 369 to make the result a perfect square?
Group D 20/09/2022 (Evening)
(a) 30 (b) 25 (c) 40 (d) 31

Q.237. A number added to its one-third is equal to 12. The number is_____.
Group D 22/09/2022 (Morning)
(a) 9 (b) 3 (c) 4 (d) 6

Q.238. If 128 is divided into two parts such that one part is three times the other, then the larger part is_____.
Group D 22/09/2022 (Afternoon)
(a) 84 (b) 96 (c) 104 (d) 92

Q.239. Simplify $(\frac{1}{512})^{\frac{-2}{3}} \div (\frac{1}{64})^{\frac{-4}{3}}$ =?
Group D 22/09/2022 (Afternoon)
(a) $\frac{2}{3}$ (b) $\frac{3}{4}$ (c) $\frac{1}{4}$ (d) $\frac{1}{6}$

Q.240. Express $5.\overline{7}$ in $\frac{p}{q}$ form, where p and q are integers and q ≠ 0.
Group D 22/09/2022 (Afternoon)
(a) $\frac{52}{7}$ (b) $\frac{52}{9}$ (c) $\frac{57}{10}$ (d) $\frac{57}{7}$

Q.241. 68 is divided into three parts. When the first part is increased by 2, the second part is diminished by 2 and the third part is divided by 2, the resultant numbers all become equal. Find the value of the third part.
Group D 22/09/2022 (Afternoon)
(a) 34 (b) 68 (c) 19 (d) 15

Q.242. $\sqrt{\frac{\sqrt{211600} + \sqrt{400}}{48000}}\ equals$:
Group D 22/09/2022 (Evening)
(a) $\frac{1}{4}$ (b) $\frac{1}{10}$ (c) $\frac{1}{48}$ (d) $\frac{1}{12}$

Q.243. Simplify the given expression.
$\frac{140 \times 140 + 280 \times 450 \div 3 + 150 \times 150}{290}$
Group D 22/09/2022 (Evening)
(a) 270 (b) 290 (c) 280 (d) 275

Q.244. $\frac{9^4 \times 10^3 \times 4^{-4} \times 16^{\frac{1}{2}}}{5^6 \times 3^6}$ equal:
Group D 26/09/2022 (Morning)
(a) $\frac{1}{4000}$ (b) $\frac{4}{9000}$ (c) $\frac{1}{9000}$ (d) $\frac{9}{1000}$

Q.245. If $0.3\overline{72} = \frac{x}{y}$, where x and y are coprime, then what is the value of (x + y)?
Group D 26/09/2022 (Morning)
(a) 186 (b) 134 (c) 151 (d) 143

Q.246. The value of
$\frac{[(34.45)]^2 - (11.75)^2] \times 5.15}{[(25.75)^2 + (25.75 \times 20.45)] \times 22.7}$ is :
Group D 26/09/2022 (Morning)
(a) $\frac{1}{5}$ (b) $\frac{1}{2}$ (c) $\frac{2}{3}$ (d) $\frac{1}{10}$

Q.247. Express $4.\overline{142}$ in the form $\frac{p}{q}$, where p and q are integers q ≠ 0.
Group D 26/09/2022 (Afternoon)
(a) $\frac{4138}{999}$ (b) $\frac{4136}{999}$ (c) $\frac{4142}{999}$ (d) $\frac{4140}{999}$

Q.248. If $0.72\overline{45} = \frac{a}{b}$, where the HCF of a and b is 1, then what is the value of (b - a) ?
Group D 26/09/2022 (Afternoon)
(a) 113 (b) 313 (c) 303 (d) 606

Q.249. Simplify
$(x + 2)(2x + 5)(x - 4) + x^2 + 5x - 12.$
Group D 26/09/2022 (Afternoon)
(a) $2x^3 + 2x^2 - 21x - 12$
(b) $x^3 + 2x^2 - 21x - 52$
(c) $2x^3 + 2x^2 - 21x - 52$
(d) $2x^3 + x^2 - 21x - 52$

Q.250. Simplify
$(3x + 4)^2 + (3x - 4)^2 + (3x + 4)(3x - 4)$
Group D 26/09/2022 (Evening)
(a) $27x^2 - 24x + 16$ (b) $27x^2 + 16$
(c) $27x^2 + 48x + 32$ (d) $27x^2 - 16$

Q.251. The value of
$\frac{[(0.68)^2 + (0.32)^2 + 16 \times 0.0136]}{[(0.68)^3 - (0.32)^3] \div (0.3)^2}$ is
Group D 26/09/2022 (Evening)
(a) $\frac{1}{4}$ (b) $\frac{3}{5}$ (c) $\frac{3}{8}$ (d) $\frac{1}{2}$

Q.252. If $0.0\overline{216}$ is written as a fraction in lowest terms, then what is the difference between the denominator and the numerator of the fraction ?
Group D 26/09/2022 (Evening)
(a) 187 (b) 183 (c) 181 (d) 179

Q.253. $[\{(9261)^{\frac{1}{3}} \div 81^{\frac{1}{4}}\}^2 \times \sqrt[4]{1296}]$ equals :
Group D 26/09/2022 (Evening)
(a) 147 (b) 174 (c) 294 (d) 249

Q.254. If $(\frac{32}{243})^k = \frac{8}{27}$, $then\ k$ = _____.
Group D 26/09/2022 (Evening)
(a) $\frac{5}{3}$ (b) $\frac{2}{3}$ (c) $\frac{3}{5}$ (d) $\frac{3}{2}$

Q.255. The value of $\frac{(0.42)^2 + 36(0.05)^2}{9(0.21)^2 + (0.45)^2}$
Group D 27/09/2022 (Morning)
(a) $\frac{2}{9}$ (b) $\frac{5}{18}$ (c) $\frac{2}{3}$ (d) $\frac{4}{9}$

Q.256. If x = $\left(\sqrt{2352} \div \sqrt{1200}\right) \div \sqrt{0.04}$,then the value of $\frac{x+1}{x-1}$ is:
Group D 27/09/2022 (Morning)
(a) $\frac{3}{2}$ (b) $\frac{4}{3}$ (c) $\frac{2}{3}$ (d) $\frac{3}{4}$

Q.257. If 0.25 a = 0.05 b, then which of the options below gives the best approximation of the value of $\frac{b-a}{b+a}$?
Group D 27/09/2022 (Morning)
(a) 0.16 (b) 1.6 (c) 0.67 (d) 6.6

Q.258. If one-third of a number is 6 more than the number itself, then find the number.
Group D 27/09/2022 (Morning)
(a) -5 (b) -9 (c) -7 (d) -6

Q.259. Simplify the given expression.
$4(\frac{3}{2}x^2 - 4x + 3) - \frac{1}{2}(4x^2 + 8x - 18)$
Group D 27/09/2022 (Morning)
(a) $4x^2 - 20x + 21$ (b) $4x^2 + 20x - 21$
(c) $4x^2 + 20x + 21$ (d) $4x^2 - 20x - 21$

Q.260. Simplify the following :
$0.\overline{06} \times 8.\overline{3}$
Group D 27/09/2022 (Afternoon)
(a) $0.\overline{050}$ (b) $0.0\overline{50}$ (c) $0.\overline{50}$ (d) $0.1\overline{50}$

Q.261. Simplify the given expression.
$\frac{5}{2}x^2 + 4x + \frac{3}{2} + \frac{x^2}{2} - 6x + \frac{5}{2}$
Group D 27/09/2022 (Afternoon)
(a) $3x^2 + 2x + 4$ (b) $3x^2 - 2x + 4$
(c) $3x^2 - 2x - 4$ (d) $3x^2 + 2x - 4$

Q.262. Simplify the given expression.
$(\sqrt{1008} \div \sqrt{448}) \times \sqrt{0.16}$
Group D 27/09/2022 (Afternoon)
(a) 0.8 (b) 0.9 (c) 0.3 (d) 0.6

Q.263. Express $0.\overline{12}$ in the form $\frac{p}{q}$, where p and q are integers and q ≠ 0.
Group D 27/09/2022 (Afternoon)
(a) $\frac{5}{33}$ (b) $\frac{6}{33}$ (c) $\frac{7}{33}$ (d) $\frac{4}{33}$

Q.264. If 0.045 + 0.154 – 0.09 + 1.5 – (0.3 × 0.8) = x – 0.231, then the value of x lies between:
Group D 27/09/2022 (Evening)
(a) 1.8 and 2.0 (b) 1.1 and 1.3
(c) 1.3 and 1.5 (d) 1.5 and 1.8

Q.265. Express $3.\overline{31}$ in the form $\frac{p}{q}$, where p and q are integers and q ‡ 0.
Group D 27/09/2022 (Evening)
(a) $\frac{329}{99}$ (b) $\frac{109}{33}$ (c) $\frac{10}{3}$ (d) $\frac{328}{99}$

Q.266. The simplest form of the ratio 722 : 1083 is:
Group D 28/09/2022 (Morning)
(a) 3 : 2 (b) 3 : 5 (c) 2 : 3 (d) 1 : 3

Q.267. Express $0.\overline{25}$ in the form $\frac{p}{q}$, where p and q are integers and q ≠ 0.
Group D 28/09/2022 (Afternoon)
(a) $\frac{25}{10000}$ (b) $\frac{25}{90}$ (c) $\frac{25}{100}$ (d) $\frac{25}{99}$

Q.268. Find x and y in the equivalent fraction given below.
$\frac{x}{9} = \frac{105}{63} = \frac{5}{y}$
Group D 28/09/2022 (Evening)
(a) x = 3, y = 5 (b) x = 15, y = 9
(c) x = 12, y = 3 (d) x = 15, y = 3

Q.269. Simplify
$3x(x + 2) - 5x(x - 3) + 7$
Group D 28/09/2022 (Evening)
(a) $-2x^2 + 21x + 7$ (b) $2x^2 + 11x + 7$
(c) $2x^2 + 21x + 7$ (d) $-2x^2 + 21x + 6$

Q.270. Express $0.2\overline{7}$ in the form $\frac{p}{q}$, where p and q are integers and q ≠ 0.
Group D 28/09/2022 (Evening)
(a) $\frac{2}{9}$ (b) $\frac{1}{3}$ (c) $\frac{1}{6}$ (d) $\frac{5}{18}$

Q.271. If $x = \frac{\sqrt{1125} \times \sqrt{405}}{\sqrt{729}}$, then the value of $\sqrt{x}$ is :
Group D 28/09/2022 (Evening)
(a) 9 (b) 3 (c) 5 (d) 25

Q.272. $\frac{5}{12}$ is the same as
Group D 29/09/2022 (Morning)
(a) $0.41\overline{6}$ (b) $0.41\overline{7}$ (c) $0.\overline{416}$ (d) $0.4\overline{16}$

Q.273. Evaluate $\sqrt{21+\sqrt{19-\sqrt{6+3.}}}$.
Group D 29/09/2022 (Morning)
(a) 7 (b) 4 (c) 3 (d) 5

Q.274. Simplify the given expression.
$3x(x-9)-9x^2+2x+24-x^3$
Group D 29/09/2022 (Afternoon)
(a) $24+25x-6x^2-x^3$
(b) $24-25x-6x^2-x^3$
(c) $24-25x+6x^2-x^3$
(d) $24-25x-6x^2+x^3$

Q.275. Simplify $\left(\frac{16a^{\frac{4}{3}}b^{\frac{-5}{6}}}{a^{\frac{-2}{3}}b^{\frac{1}{6}}}\right)^{\frac{1}{2}}$
Group D 29/09/2022 (Afternoon)
(a) $\frac{4a}{b^2}$ (b) $\frac{a}{b^{\frac{1}{2}}}$ (c) $\frac{4a}{b^{\frac{1}{2}}}$ (d) $\frac{1}{(ab)^{\frac{1}{2}}}$

Q.276. If $\sqrt{y}\div\sqrt{121}$= 0.03, then find the value of y, giving your answer correct to 3 decimal places.
Group D 29/09/2022 (Afternoon)
(a) 1.760 (b) 0.109 (c) 0.176 (d) 1.640

Q.277. Simplify the given expression.
$3x(x-3)+2(3x^2-4)$
Group D 29/09/2022 (Evening)
(a) $9x^2-9x+8$ (b) $9x^2-9x-8$
(c) $9x^2+9x+8$ (d) $9x^2+9x-8$

Q.278. Find the value of n, when $216^{\frac{2}{n}}$ = 36.
Group D 30/09/2022 (Morning)
(a) 1 (b) 6 (c) 3 (d) 9

Q.279. Evaluate $(\frac{-5}{7})^{-6}\times(\frac{-5}{7})^{4}$
Group D 30/09/2022 (Morning)
(a) $\frac{49}{25}$ (b) $\frac{125}{343}$ (c) $\frac{25}{49}$ (d) $\frac{343}{125}$

Q.280. The value of
$\sqrt{2+\sqrt{2+\sqrt{2\ldots\ldots\ldots\ldots is}}}$
Group D 30/09/2022 (Morning)
(a) 2 (b) 2.5 (c) 1.5 (d) 1.75

Q.281. Which of the following is equal to $0.1\overline{82}$?
Group D 30/09/2022 (Afternoon)
(a) $\frac{181}{990}$ (b) $\frac{81}{500}$ (c) $\frac{1}{999}$ (d) $\frac{1}{9}$

Q.282. Simplify $(3^{-1}\times 6^{-1})^{-1}\div 3^{-1}$
Group D 30/09/2022 (Evening)
(a) 65 (b) 56 (c) 45 (d) 54

Q.283. $\sqrt{\frac{(0.05)^2+(0.15)^2+(0.053)^2}{0.005^2+0.015^2+0.0053^2}}$ find the value ?
Group D 30/09/2022 (Evening)
(a) 10^4 (b) 10 (c) 10^2 (d) 10^3

Q.284. Which is the smallest fraction among the options given below ?
Group D 06/10/2022 (Morning)
(a) $\frac{1981}{150}$ (b) $\frac{1981}{155}$ (c) $\frac{1981}{153}$ (d) $\frac{1981}{152}$

Q.285. Find the value of n, when $2^{-7}\times 2^{3n+4}=2^{11}\div 2^5$.
Group D 06/10/2022 (Morning)
(a) 2 (b) 5 (c) 3 (d) 4

Q.286. $\sqrt{8836}+\sqrt{6084}-\sqrt{1849}$ equals:
Group D 06/10/2022 (Afternoon)
(a) 121 (b) 162 (c) 129 (d) 126

Q.287. If a = $(0.\overline{29}+0.3\overline{2})\times(0.\overline{2}+0.\overline{15})+0.\overline{3}$, then the value of a is:
Group D 06/10/2022 (Afternoon)
(a) 0.5632 (b) 2.33 (c) 3.66 (d) 1.33

Q.288. Let. $0.\overline{27}\div 3.\overline{2}$ = x, where x is a proper fraction in the simplest form. Then the sum of the numerator and the denominator of x is:
Group D 06/10/2022 (Afternoon)
(a) 346 (b) 340 (c) 342 (d) 296

Q.289. Express $2.\overline{6}$ as an improper fraction.
Group D 06/10/2022 (Evening)
(a) $\frac{22}{9}$ (b) $\frac{20}{9}$ (c) $\frac{7}{3}$ (d) $\frac{8}{3}$

Q.290. Simplify the following
$(-2)^4\div(-2)^6$
Group D 07/10/2022 (Morning)
(a) 4 (b) - $\frac{1}{4}$ (c) - 4 (d) $\frac{1}{4}$

Q.291. Find the value of 'y' in the equation given below .
$3\frac{1}{2}+2\frac{5}{7}\times y-\frac{1}{2}\div 2=4\frac{1}{4}$
Group D 07/10/2022 (Afternoon)
(a) $\frac{7}{19}$ (b) 0 (c) $\frac{19}{7}$ (d) $\frac{7}{5}$

Q.292. Simplify the following $(\frac{(xy^2z)^{-3}}{y^{-3}})^2$
Group D 07/10/2022 (Evening)
(a) $x^6y^{18}z^6$ (b) $\frac{1}{x^6y^6z^6}$
(c) $\frac{1}{x^6y^{18}z^6}$ (d) $x^6y^6z^6$

Q.293. Simplify the following.
$-2-[3-\{3-(4-5)\}]$
Group D 07/10/2022 (Evening)
(a) - 2 (b) 1 (c) - 3 (d) - 1

Q.294. Simplify the following.
$1-2\times[\{-2(2+3)\times 20\}\div 2]$
Group D 11/10/2022 (Morning)
(a) - 200 (b) - 50 (c) - $\frac{1}{50}$ (d) 201

Q.295. If 1.345 + 13.45 + 0.1354 + 0.0596 = 11.453 − 0.543 + k , then what is the value of k ?
Group D 11/10/2022 (Afternoon)
(a) 4.08 (b) 4.48 (c) 3.06 (d) 3.28

RRB NTPC CBT - 2 (09/05/2022 to 17/06/2022)

Q.296. If $56\div 14\times 2^2-12\times 6\div 3+10$ = z, then find the value of z.
Level 6 (09/05/2022) Shift 1
(a) 3 (b) 4 (c) 6 (d) 2

Q.297. If 0.17y = 10.2, find the value of y.
Level 6 (09/05/2022) Shift 1
(a) 0.6 (b) 60 (c) 600 (d) 6

Q.298. Simplify the following expression.
$\frac{12-6\div 2+4}{3^2\times 3-7+6}$
Level 6 (09/05/2022) Shift 1
(a) $\frac{1}{2}$ (b) $\frac{11}{26}$ (c) $\frac{13}{18}$ (d) $\frac{11}{18}$

Q.299. Find the value of the expression:
$1-\frac{(4\div 5-1\times 3+2)\times 8}{3^2\times 8-4\times 2}$
Level 6 (09/05/2022) Shift 1
(a) $\frac{39}{40}$ (b) $\frac{41}{40}$ (c) 0 (d) $\frac{5}{8}$

Q.300. Simplify the expression
$\sqrt{0.25}+2\sqrt{0.0049}-0.3\sqrt{0.09}$
Level 6 (09/05/2022) Shift 2
(a) 0.1 (b) 2.73 (c) 5.05 (d) 0.55

Q.301. The value of $4\frac{1}{3}\div[2\frac{2}{3}-\frac{1}{3}\times 4\frac{1}{2}-3\frac{1}{3}]$ is:
Level 4 (10/05/2022) Shift 1
(a) $1\frac{14}{25}$ (b) $1\frac{1}{25}$ (c) $1\frac{37}{41}$ (d) $1\frac{2}{5}$

Q.302. The value of
$\frac{12-[(3-5)\times 4]\div 8-8+[6\div(12\times 2)]}{9\times 15\div(12\times 10)-[12\div(6\times 2)]}$
is :
Level 4 (10/05/2022) Shift 1
(a) 42 (b) $\frac{21}{17}$ (c) 48 (d) $\frac{3}{4}$

Q.303. Simplify the following expression.
81.7100 + 198.0020 − 2071.1985 + 9.0900 + 1591.42
Level 4 (10/05/2022) Shift 1
(a) −190.8765 (b) − 190.9865
(c) 190.9865 (d) −190.9865

Q.304. Which of the following options is the closest approximate value which will come in place of question mark (?) in the following equation?
6.05 − 15.95 ÷ 3.95 + 2.99 × 7.04 = ?
Level 4 (10/05/2022) Shift 1
(a) 30 (b) 13 (c) 18 (d) 23

Q.305. If 32% of 22.5 − $\frac{2}{3}$ × $\sqrt[3]{512}$ × $\sqrt{81}$ = y , then the value of y is:
Level 5 (12/06/2022) Shift 1
(a) −40.2 (b) −41.2 (c) −40.8 (d) −41.8

Q.306. If 27 × 3 × 896 ÷ $\sqrt{3136}$ = y + 640, then find the value of y.
Level 5 (12/06/2022) Shift 2
(a) 666 (b) 648 (c) 664 (d) 656

Q.307. Simplify: $\sqrt{\frac{\sqrt{1875}}{\sqrt{3888}} \times \frac{\sqrt{768}}{\sqrt{1200}}}$
Level 2 (13/06/2022) Shift 1
(a) $\frac{\sqrt{5}}{6}$ (b) $\frac{\sqrt{5}}{3}$ (c) $\frac{5}{12}$ (d) $\frac{5}{6}$

Q.308. The value of 36 ÷ (8 × 3) − [3 ÷ {4 × {3 × 4 ÷ (5 − 9) + 6}}] lies between
Level 2 (13/06/2022) Shift 1
(a) 0.7 and 1 (b) 1 and 1.3
(c) 1.3 and 1.6 (d) 1.6 and 1.9

Q.309. Simplify the following expression:
$\frac{2}{3} + \frac{4}{9} \div (\frac{7}{2} - \frac{5}{6})$
Level 2 (13/06/2022) Shift 1
(a) $\frac{11}{12}$ (b) $\frac{5}{6}$ (c) 1 (d) $\frac{7}{6}$

Q.310. Simplify: 5 + $\frac{5 \times 5}{5}$ − 5
Level 2 (13/06/2022) Shift 1
(a) 25 (b) 15 (c) 10 (d) 5

Q.311. The value of
$\frac{(11\frac{11}{12} \times 1\frac{3}{13} \div 2\frac{3}{4}) \div (\frac{7}{10} \div (\frac{3}{4} \times 1\frac{2}{5}))}{\frac{1}{4} \times \frac{2}{3} \times 2\frac{2}{5}}$
is
Level 2 (13/06/2022) Shift 2
(a) $1\frac{1}{5}$ (b) 20 (c) $3\frac{1}{5}$ (d) 10

Q.312. Find the value of .
$(13)^3 + (-8)^3 + (-5)^3$
Level 2 (13/06/2022) Shift 2
(a) -40 × 41 (b) 39 × 40
(c) -39 × 40 (d) 41 × 38

Q.313. The value of 49 − [35 + {12 ÷ 3 of (6 + $\overline{7 - 12}$)}] is:
Level 2 (13/06/2022) Shift 2
(a) -8 (b) -12 (c) 10 (d) 9

Q.314. Which of the following fractions should be added to $\frac{5}{9}$ to obtain $\frac{11}{6}$ as the sum ?
Level 2 (13/06/2022) Shift 2
(a) $1\frac{7}{18}$ (b) $1\frac{1}{15}$ (c) $1\frac{5}{18}$ (d) $1\frac{1}{3}$

Q.315. The value of:
$(1\frac{1}{3} \times 1\frac{4}{5} \div \frac{3}{5}) \times \frac{3}{8} - \frac{2}{3}$
Level 3 (14/06/2022) Shift 1
(a) $\frac{3}{2}$ (b) $\frac{1}{4}$ (c) $\frac{5}{6}$ (d) $\frac{7}{2}$

Q.316. If $\sqrt{64}$ − $\sqrt[3]{64}$ = $\sqrt[4]{y}$, where y > 0, then the value of y is:
Level 3 (14/06/2022) Shift 1
(a) 256 (b) 16 (c) 625 (d) 81

Q.317. Find the reciprocal of the sum of the reciprocals of the numbers.
$\frac{1}{4}, \frac{4}{3}, \frac{5}{7}, \frac{5}{4}, \frac{8}{5}$
Level 3 (14/06/2022) Shift 2
(a) $\frac{23}{22}$ (b) $\frac{22}{23}$ (c) $\frac{40}{303}$ (d) $\frac{607}{120}$

Q.318. Which of the following values can replace K in $7\frac{3}{5} \times 4\frac{1}{2} - K = 26\frac{3}{4}$?
Level 3 (14/06/2022) Shift 2
(a) $2\frac{1}{2}$ (b) $9\frac{7}{20}$ (c) $7\frac{9}{20}$ (d) 2

Q.319. Simplify $\frac{7 + 3\sqrt{5}}{3 + \sqrt{5}} + \frac{7 - 3\sqrt{5}}{3 - \sqrt{5}}$.
Level 3 (14/06/2022) Shift 2
(a) 14 (b) 6 (c) 3 (d) 4

Q.320. Simplify :
$\sqrt[6]{4096} + \sqrt[4]{4096} + \sqrt[3]{4096} + \sqrt{4096}$
Level 5 (15/06/2022) Shift 1
(a) 92 (b) $\frac{\sqrt{2}}{2}$ (c) 90 (d) $\sqrt{2}$

Q.321. Which of the following fractions is the greatest?
Level 5 (15/06/2022) Shift 1
(a) $\frac{8}{9}$ (b) $\frac{17}{20}$ (c) $\frac{37}{40}$ (d) $\frac{22}{25}$

Q.322. Evaluate: $\frac{2.91^2 - 1.09^2}{1.82}$
Level 5 (15/06/2022) Shift 1
(a) 3 (b) 2 (c) 5 (d) 4

Q.323. Simplify :
65 − [40 − (60 ÷ 5 − (18 − 24 ÷ 4) ÷ 6)]
Level 5 (15/06/2022) Shift 1
(a) 30 (b) 40 (c) 37 (d) 35

Q.324. Simplify the following expression.
$0.\overline{12} - 0.\overline{6} + 0.\overline{3}$
Level 5 (15/06/2022) Shift 2
(a) $\frac{9}{100}$ (b) $\frac{37}{33}$ (c) − $\frac{5}{11}$ (d) − $\frac{7}{33}$

Q.325. Simplify the expression:
$\frac{4^{524} - 4^{522} + 30}{4^{522} + 2}$
Level 5 (15/06/2022) Shift 2
(a) $\frac{25}{4}$ (b) $\frac{15}{4}$ (c) 30 (d) 15

Q.326. Evaluate
$\frac{0.4 \times 0.4 \times 0.4 + 0.05 \times 0.05 \times 0.05}{0.8 \times 0.8 \times 0.8 + 0.1 \times 0.1 \times 0.1}$
Level 5 (15/06/2022) Shift 2
(a) $\frac{1}{7}$ (b) $\frac{1}{4}$ (c) $\frac{1}{8}$ (d) $\frac{1}{10}$

Q.327. Evaluate: $\sqrt[3]{16384} \div \sqrt[3]{256}$
Level 5 (15/06/2022) Shift 3
(a) 6 (b) 4 (c) 2 (d) 3

Q.328. Simplify the following expression,
0.002 + 5.025 − 35.08 − 5.058
Level 5 (15/06/2022) Shift 3
(a) − 45.165 (b) − 35.111
(c) 35.111 (d) 45.165

Q.329. The value of $\frac{3}{4}$ of $2\frac{2}{3} \div \frac{5}{9}$ of 1 $\frac{1}{5} - \frac{3}{5}$ of ($\frac{2}{3} \div \frac{2}{3}$ of $\frac{3}{2}$) + $\frac{4}{5} \times 1\frac{1}{9} \div \frac{8}{15} - \frac{2}{3}$ is :
Level 2 (16/06/2022) Shift 1
(a) $1\frac{3}{10}$ (b) $3\frac{3}{5}$ (c) $3\frac{9}{10}$ (d) $4\frac{2}{5}$

Q.330. The value of the expression
$43\frac{2}{3} \div [35 + \frac{3}{4}$ of 24 + (42 ÷ 7 − $5\frac{1}{3}$)]
is
Level 2 (16/06/2022) Shift 1
(a) $\frac{91}{161}$ (b) $\frac{131}{161}$ (c) $\frac{121}{161}$ (d) $\frac{109}{161}$

Q.331. Simplify the following expression:
$\sqrt{12.5 \times 8 \times 1.44}$
Level 2 (16/06/2022) Shift 1
(a) 12 (b) 15 (c) 10 (d) 13

Q.332. Simplify the following expression:
$\frac{15^3 + 20^3 + 25^3 - 22500}{15^2 + 20^2 + 25^2 - 300 - 500 - 375}$
Level 2 (16/06/2022) Shift 1
(a) 75 (b) 80 (c) 50 (d) 60

Q.333. Simplify the following:
$\frac{10 - \left[\frac{3}{4} + \left\{4\frac{1}{2} - \left(\frac{1}{4} + \frac{1}{84}\right)\right\}\right]}{4}$
Level 2 (16/06/2022) Shift 2
(a) $3\frac{85}{336}$ (b) $4\frac{85}{336}$ (c) $2\frac{85}{336}$ (d) $1\frac{85}{336}$

Q.334. Find the value of k, if k% of 280 = 50% of 350
Level 2 (16/06/2022) Shift 2
(a) 75 (b) 62.5 (c) 72.5 (d) 60

Q.335. Which of the following fractions is the largest?
$\frac{7}{9}, \frac{6}{7}, \frac{22}{25}$, and $\frac{11}{13}$
Level 2 (16/06/2022) Shift 2
(a) $\frac{7}{9}$ (b) $\frac{11}{13}$ (c) $\frac{6}{7}$ (d) $\frac{22}{25}$

Q.336. Simplify the following expression:
$\frac{\frac{17}{2} \div \frac{15}{2} \times \frac{13}{2}}{\frac{17}{2} \div \left(\frac{15}{2} \times \frac{13}{2}\right)} \div \frac{169}{30}$
Level 2 (16/06/2022) Shift 2
(a) 6 (b) $7\frac{1}{2}$ (c) 7 (d) $6\frac{1}{2}$

Q.337. Which of the following options is the closest approximate value which will come in place of question mark(?) in the following equation?
24.99% of 799.897 + 29.989% of 120.010 = 190 + 22.998% of ?
Level 2 (16/06/2022) Shift 3
(a) 150 (b) 180 (c) 220 (d) 200

Q.338. The value of
$\frac{(34.2 \times 6.84) \div (102.6 \times 0.00171)}{(12.5 \times 0.8) \div 0.03}$
Level 2 (16/06/2022) Shift 3
(a) 0.4 (b) 4 (c) 0.04 (d) 0.004

Q.339. Find the value of
$\frac{32}{46} \times \frac{94}{576} \times \frac{184}{282}$
Level 2 (16/06/2022) Shift 3
(a) $\frac{2}{9}$ (b) $\frac{2}{27}$ (c) $\frac{2}{3}$ (d) $\frac{27}{2}$

Q.340. If $1\frac{1}{4} \times (5\frac{3}{4} \div \frac{2}{7} of k) \div 2\frac{7}{8} - 3\frac{3}{4} = (17 - 4) \div 2$ of 2, when is the value of $\frac{k+1}{k-1}$?
Level 2 (16/06/2022) Shift 3
(a) 7 (b) 9 (c) $\frac{5}{2}$ (d) $\frac{11}{3}$

Q.341. The positive value of
$\frac{1}{1+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} + \ldots\ldots\ldots + \frac{1}{\sqrt{15}+\sqrt{16}}$ is
Level 2 (16/06/2022) Shift 3
(a) 3 (b) 4 (c) 1 (d) 2

Q.342. Simplify the following expression:
$2\frac{1}{6} \times \{1\frac{19}{26} + \frac{15}{13} \times (\frac{5}{7} \div \frac{25}{14})\}$
Level 2 (16/06/2022) Shift 3
(a) $4\frac{5}{6}$ (b) $4\frac{2}{3}$ (c) $4\frac{3}{4}$ (d) $4\frac{4}{5}$

Q.343. What should come in place of p in the following equation.
43240 – 30608 = p × 160
Level 2 (16/06/2022) Shift 3
(a) 79.85 (b) 78.95 (c) 75.89 (d) 78.59

Q.344. Simplify:
484.71 + 285.33 - 827.38 + 73.9 = ?
Level 3 (17/06/2022) Shift 1
(a) 16.56 (b) 36.54 (c) 15.78 (d) 19.78

Q.345. The value of $5\sqrt{12} + 6\sqrt{27} - 4\sqrt{75} + \sqrt{192}$ is:
Level 3 (17/06/2022) Shift 1
(a) $22\sqrt{3}$ (b) $16\sqrt{3}$ (c) $18\sqrt{3}$ (d) $20\sqrt{3}$

Q.346. What is the value of $\frac{9}{15} \times \frac{45}{81}$ $\{\frac{49}{6} \times (\frac{16}{7} - 2) \times \frac{24}{5} \times \frac{15}{16}\}$?
Level 3 (17/06/2022) Shift 1
(a) 6.5 (b) 3.5 (c) 7.5 (d) 4.5

Q.347. If a = $\frac{17}{99}$, b = $\frac{13}{47}$ and c = $\frac{34}{33}$, then what is the value of (ab) ÷ c = ?
Level 3 (17/06/2022) Shift 2
(a) $\frac{17}{264}$ (b) $\frac{13}{282}$ (c) $\frac{19}{289}$ (d) $\frac{21}{354}$

Q.348. $\frac{5}{6} \times \frac{3}{7} + y = \frac{29}{63}$.
What is the value of (10y - 1) ?
Level 3 (17/06/2022) Shift 2
(a) $\frac{13}{126}$ (b) $\frac{2}{63}$ (c) $-\frac{3}{63}$ (d) $\frac{5}{42}$

Q.349. The value of the expression $7\frac{2}{3} \times 5\frac{3}{4} + 9\frac{1}{2} \times 6\frac{3}{4}$ is
Level 3 (17/06/2022) Shift 3
(a) $114\frac{1}{24}$ (b) $98\frac{3}{24}$
(c) $108\frac{5}{24}$ (d) $103\frac{7}{24}$

Q.350. Find the value of x in the following equation:
$[1 + \frac{1}{1+\frac{1}{1+\frac{1}{5}}}] \div 1\frac{6}{11} = \frac{x}{2}$
Level 3 (17/06/2022) Shift 3
(a) 2 (b) 1 (c) $\frac{1}{2}$ (d) $\frac{2}{3}$

RRB NTPC CBT - 1
(28/12/2020 to 31/07/2021)

Q.351. The value of $\frac{6}{5}$ of $(\frac{1}{3} + \frac{2}{4})$ - $\frac{5}{6}$ of $(\frac{3}{10} + \frac{12}{20})$ - $\frac{1}{6}$ is
RRB NTPC 28/12/2020 (Morning)
(a) $\frac{1}{3}$ (b) $\frac{3}{4}$ (c) $\frac{5}{6}$ (d) $\frac{1}{12}$

Q.352. The value of:
$5\frac{2}{3}$ + 0.73 - 3.123 is equal to
RRB NTPC 28/12/2020 (Morning)
(a) 3.27 (b) 3.12 (c) 2.55 (d) 5.73

Q.353. The value of $\frac{\sqrt{54} \times \sqrt{125}}{\sqrt{24} \times \sqrt{45}}$ is
RRB NTPC 28/12/2020 (Morning)
(a) $4\sqrt{6}$ (b) 4 (c) $2\sqrt{5}$ (d) 2.5

Q.354. If P = 0.3 × 0.3 + 0.03 × 0.03 - 0.6 × 0.03 and Q = 0.54, then $\frac{P}{Q}$ is equal to
RRB NTPC 28/12/2020 (Evening)
(a) 4.5 (b) 0.45 (c) 4.05 (d) 0.135

Q.355. Solve the following:
$\frac{1}{2} \times \frac{2}{3} - \frac{3}{4} (\frac{1}{2} \times \frac{1}{3} + \frac{5}{6}) \times \frac{4}{21}$ = ?
RRB NTPC 28/12/2020 (Evening)
(a) 2 (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) $\frac{4}{21}$

Q.356. If $\frac{\sqrt{19 - x\sqrt{12}}}{1} = \sqrt{4} - \sqrt{3}$, then the value of x is equal to
RRB NTPC 28/12/2020 (Evening)
(a) $\sqrt{3} + 2$ (b) $2 + 2\sqrt{3}$
(c) $\sqrt{3} - 2$ (d) $2 + 4\sqrt{3}$

Q.357. If $\sqrt{2} + \sqrt{x} = \sqrt{3}$, then the value of x is equal to
RRB NTPC 28/12/2020 (Evening)
(a) $-2\sqrt{6} - 5$ (b) $2\sqrt{6} - 5$
(c) $5 + 2\sqrt{6}$ (d) $5 - 2\sqrt{6}$

Q.358. If $\sqrt{4624} = 68$, then the value of $\sqrt{46.24} + \sqrt{0.4624} + \sqrt{0.004624}$ is
RRB NTPC 29/12/2020 (Morning)
(a) 7.648 (b) 7.548 (c) 7.854 (d) 7.458

Q.359. Simplify :
$62 \div 5 - (\frac{8}{9} \times \frac{18}{7}) \times \frac{7}{5} + \frac{5}{4} \times \frac{16}{25}$
RRB NTPC 29/12/2020 (Morning)
(a) 12 (b) 15 (c) 5 (d) 10

Q.360. Find the value of $\sqrt{150} - \sqrt{54} - \sqrt{24}$
RRB NTPC 29/12/2020 (Morning)
(a) 1 (b) 72 (c) 0 (d) 75

Q.361. The value of
$\sqrt{72 \times 18} + \sqrt{0.04} + \sqrt{0.64}$ is
RRB NTPC 29/12/2020 (Evening)
(a) 37 (b) 12 (c) 24 (d) 36

Q.362. The value of
$\frac{11}{5} - (\frac{2}{3}$ of $\frac{3}{5} - \frac{1}{5}) + (\frac{6}{5} \div \frac{4}{5})$ is

RRB NTPC 29/12/2020 (Evening)
(a) $\frac{1}{5}$ (b) $\frac{7}{2}$ (c) $\frac{2}{3}$ (d) $\frac{3}{5}$

Q.363. The value of $\frac{1}{0.24}$ of 1.44 is
RRB NTPC 29/12/2020 (Evening)
(a) 12 (b) 140 (c) 6 (d) 166

Q.364. Solve the following.
6202.5 + 620.25 + 62.025 + 6.2025 + 0.62025 = ?
RRB NTPC 30/12/2020 (Morning)
(a) 6791.59775 (b) 6891.59775
(c) 6891.59675 (d) 5892.59775

Q.365. Solve the following.
$\frac{(5-\frac{42}{14}+65)+\{\frac{(2+63)}{13}\}\times[(72-19)]+(19-195)}{369}$
RRB NTPC 30/12/2020 (Morning)
(a) $\frac{156}{369}$ (b) 224 (c) -24 (d) -25

Q.366. Value of the square root of $\frac{36.1}{102.4}$ is
RRB NTPC 30/12/2020 (Morning)
(a) $\frac{19}{31}$ (b) $\frac{19}{34}$ (c) $\frac{19}{32}$ (d) $\frac{61}{340}$

Q.367. Simplify. $\frac{25+3\ of\ 8-4}{27-3\ of\ (8-4)}$
RRB NTPC 30/12/2020 (Evening)
(a) 4 (b) $\frac{37}{15}$ (c) 3 (d) 5

Q.368. If $\sqrt{3^n}$= 729, then the value of n is equal to
RRB NTPC 04/01/2021 (Morning)
(a) 8 (b) 9 (c) 6 (d) 12

Q.369. A class has 48 students. On a specific day, only $\frac{3}{8}$ of the students were present. The number of absentees on the same day would be
RRB NTPC 04/01/2021 (Morning)
(a) 38 (b) 28 (c) 18 (d) 30

Q.370. The value of $\frac{(0.27)^2-(0.13)^2}{0.27+0.13}$ is
RRB NTPC 04/01/2021 (Morning)
(a) 1.40 (b) 0.40 (c) 0.03 (d) 0.14

Q.371. Simplify. $25 \div 10 - \{\frac{7}{4}\times\frac{1}{3}\}\times\frac{6}{5}+\frac{14}{3}\times\frac{9}{10}-\{\frac{1}{5}\div\frac{1}{25}\}$
RRB NTPC 04/01/2021 (Evening)
(a) 1 (b) 10 (c) 5 (d) 11

Q.372. The value of
$1\div\{\frac{1}{2}+\frac{1}{3}+\frac{1}{6}\div(\frac{3}{4}-\frac{1}{3})\}$ is
RRB NTPC 05/01/2021 (Morning)
(a) $\frac{5}{12}$ (b) $\frac{1}{12}$ (c) 1 (d) $\frac{30}{37}$

Q.373. The value of $\sqrt{\frac{36.1}{102.4}}$ is
RRB NTPC 05/01/2021 (Morning)
(a) $\frac{6.1}{34}$ (b) $\frac{19}{32}$ (c) $\frac{19}{34}$ (d) $\frac{19}{31}$

Q.374. Find the value of $0.4+\frac{404}{1000}$.
RRB NTPC 05/01/2021 (Evening)
(a) 80.4 (b) 804 (c) 0.804 (d) 0.0804

Q.375. Find the value of $[\{(2)^2\}^2]^2$
RRB NTPC 05/01/2021 (Evening)
(a) 2^4 (b) 2^{16} (c) 2^8 (d) 2^{32}

Q.376. The value of $0.\overline{23}+0.\overline{22}$ is
RRB NTPC 05/01/2021 (Evening)
(a) 0.45 (b) 0.434343....
(c) 0.4555.... (d) 0.454545....

Q.377. The denominator of a fraction is 2 more than the numerator. When the numerator is multiplied by 3 and the denominator is multiplied by 2 the fraction becomes $\frac{1}{2}$. The given fraction is
RRB NTPC 07/01/2021 (Morning)
(a) $\frac{2}{3}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) $\frac{2}{5}$

Q.378. Simplify the following $2.2\times0.2\div(0.4\times\frac{1}{2})-\frac{1}{2}\times4\ (1.04-0.2\times0.2)$
RRB NTPC 07/01/2021 (Morning)
(a) 0.3 (b) 0.6 (c) 0.2 (d) 0.5

Q.379. Select the number that can replace the question mark (?) in the following equation.
$12+8-5\times\frac{1}{2}\times12-\{45\div(34-19)\}$ = ?
RRB NTPC 07/01/2021 (Evening)
(a) 25 (b) 13 (c) -13 (d) -10

Q.380. The fractions $\frac{1}{3}, \frac{4}{7}, \frac{2}{5}$ written in ascending order are:
RRB NTPC 07/01/2021 (Evening)
(a) $\frac{4}{7}, \frac{1}{3}, \frac{2}{5}$
(b) $\frac{2}{5}, \frac{4}{7}, \frac{1}{3}$
(c) $\frac{1}{3}, \frac{2}{5}, \frac{4}{7}$
(d) All the fractions are equivalent fractions.

Q.381. Simplify the following equation:
$(4\frac{3}{4}-3\frac{1}{3})\div(\frac{3}{4}-\frac{3}{5})\frac{3}{5}\times\frac{5}{7}\times\frac{7}{9}$
RRB NTPC 07/01/2021 (Evening)
(a) $9\frac{7}{9}$ (b) $\frac{85}{29}$ (c) $\frac{452}{135}$ (d) $\frac{131}{240}$

Q.382. $\sqrt{8-2\sqrt{15}}$ is equal to:
RRB NTPC 07/01/2021 (Evening)
(a) 3 - $\sqrt{5}$ (b) $\sqrt{5}$ - $\sqrt{3}$ (c) $\sqrt{5}$ + $\sqrt{3}$ (d) 5 -$\sqrt{3}$

Q.383. Simplify $1.8+2\times\frac{3}{2}\times\frac{1}{2}\{\frac{2}{5}\div(\frac{3}{5}\times\frac{2}{3})\times\frac{3}{2}-1\}$
RRB NTPC 08/01/2021 (Morning)
(a) 0.2 (b) 1 (c) -1 (d) 2.55

Q.384. The difference between the fraction 5 minutes of an hour and 20 seconds of an hour is
RRB NTPC 08/01/2021 (Morning)
(a) $\frac{0.7}{9}$ (b) $\frac{7}{12}$ (c) $\frac{16}{180}$ (d) $\frac{28}{270}$

Q.385. Find the approximate value of $(2.697+0.498)^2-(2.697-0.498)^2$
RRB NTPC 08/01/2021 (Morning)
(a) 5.37 (b) 2.00 (c) 2.199 (d) 3.195

Q.386. Simplify.
$\frac{6.25+\frac{5}{7}\times28-5}{\frac{3}{4}\times(15.8-3.4)+5\times2.39}$
RRB NTPC 08/01/2021 (Evening)
(a) 3 (b) 1 (c) 5 (d) 4

Q.387. Solve the following.
$\sqrt{37+\sqrt{130+2\sqrt{56-\sqrt{16}-\sqrt{9}}}}$ = ?
RRB NTPC 09/01/2021 (Morning)
(a) 7 (b) 229 (c) 252 (d) 200

Q.388. Solve the following.
3.03 + 31.003 + 13.33 + 3.331
RRB NTPC 09/01/2021 (Morning)
(a) 3.597 (b) 50.370 (c) 35.97 (d) 50.694

Q.389. Solve the following.
$\{1-\frac{1}{4}\}\{1-\frac{2}{4}\}....\{1-\frac{5}{4}\}\{1-\frac{6}{4}\}$ = ?
RRB NTPC 09/01/2021 (Morning)
(a) $\frac{3}{256}$ (b) $\frac{3}{64}$ (c) $-\frac{3}{256}$ (d) 0

Q.390. Simplify.
$\sqrt{56+\sqrt{185+88\sqrt{\sqrt{36}+19}}}$
RRB NTPC 09/01/2021 (Evening)
(a) $\sqrt{91}$ (b) 81 (c) 9 (d) 3

Q.391. Simplify. $1800\div10\times\{45\div(17-2)\}\times2+\{-2(1+2)\}$
RRB NTPC 09/01/2021 (Evening)
(a) 180 (b) 1074 (c) 114 (d) 0

Q.392. Simplify. 8.8 + .08 + 8.88 + .808
RRB NTPC 10/01/2021 (Morning)
(a) 1.792 (b) 2.656 (c) 18.568 (d) 185.68

Q.393. Simplify.

$\left(0.3 \div 0.6 \times \frac{2}{3}\right) \times 0.2\ (0.2 \times 2 \div \frac{1}{2} + 0.2)$
RRB NTPC 10/01/2021 (Evening)
(a) 0.05 (b) 1.5 (c) 0.15 (d) 0.02

Q.394. Simplify:
$\frac{1}{1.2.3} + \frac{1}{2.3.4} + \frac{1}{3.4.5} + \frac{1}{4.5.6}$
RRB NTPC 10/01/2021 (Evening)
(a) $\frac{7}{30}$ (b) $\frac{19}{30}$ (c) $\frac{2}{60}$ (d) $\frac{5}{30}$

Q.395. Find the value of $\frac{1}{4} + \frac{1}{4 \times 5} + \frac{1}{4 \times 5 \times 6}$ (rounded upto 2 decimals)
RRB NTPC 11/01/2021 (Morning)
(a) 0.31 (b) 0.21 (c) 0.33 (d) 0.38

Q.396. Simplify.
1.1 + 1.001 + 10.01 + 11.11
RRB NTPC 11/01/2021 (Evening)
(a) 23.221 (b) 23.14 (c) 4.213 (d) 3.124

Q.397. The conversion of $0.0\overline{37}$ in the form $\frac{p}{q}$ is:
RRB NTPC 11/01/2021 (Evening)
(a) $\frac{37}{999}$ (b) $\frac{37}{990}$ (c) $\frac{37}{1000}$ (d) $\frac{37}{100}$

Q.398. Simplify :
$(1 - \frac{1}{2})(1 - \frac{1}{3})$ ..... $(1 - \frac{1}{9})(1 - \frac{1}{10})$
RRB NTPC 11/01/2021 (Evening)
(a) $-\frac{1}{10}$ (b) $\frac{5}{6}$ (c) 0 (d) $\frac{1}{10}$

Q.399. What is the value of the following expression ?
394 × 394 + 2 × 394 × 106 + 106 × 106
RRB NTPC 12/01/2021 (Morning)
(a) 25000 (b) 250000 (c) 2500 (d) 500

Q.400. If $19\frac{2}{3} - 7\frac{1}{4} = x + 2\frac{1}{2}$, then what will be the value of x ?
RRB NTPC 12/01/2021 (Morning)
(a) $9\frac{11}{12}$ (b) $9\frac{1}{12}$ (c) $\frac{11}{12}$ (d) $11\frac{9}{12}$

Q.401. What is the value of the following expression ?
$(-20)^3 + (13)^3 + (7)^3$
RRB NTPC 12/01/2021 (Morning)
(a) 4566 (b) - 5460 (c) 4560 (d) - 4650

Q.402. If $\sqrt{45} + \sqrt{125}$ = 17.89, then what will be the value of $\sqrt{180} + \sqrt{80}$?
(Give your answer to one decimal place.)
RRB NTPC 12/01/2021 (Evening)
(a) 71.9 (b) 13.5 (c) 22.4 (d) 21.6

Q.403. 1.236576576 can be written in the form of :
RRB NTPC 12/01/2021 (Evening)
(a) $\frac{125434}{99900}$ (b) $\frac{125334}{99000}$
(c) $\frac{123534}{99900}$ (d) $\frac{123534}{99000}$

Q.404. Which of the following options is equal to 16 ÷ 4 x 2 - 5 + 1 ?
RRB NTPC 13/01/2021 (Morning)
(a) {(16 ÷ 4) x 2} - (5 + 1)
(b) [{16 ÷ (4 x 2)} - 5] + 1
(c) {16 ÷ (4 x 2)} - (5 + 1)
(d) [{(16 ÷ 4) x 2} - 5] + 1

Q.405. The ratio in lowest terms of 4767 and 11123 is:
RRB NTPC 13/01/2021 (Morning)
(a) 3 : 17 (b) 3 : 13 (c) 3 : 7 (d) 3 : 27

Q.406. The value of $\sqrt{4}$ is:
RRB NTPC 13/01/2021 (Morning)
(a) 2 or -2 (b) 4 (c) only 2 (d) only -2

Q.407. If $(a + b\sqrt{2})^2 = 19 + 6\sqrt{2}$, then a is equal to.
RRB NTPC 13/01/2021 (Morning)
(a) 1 (b) 3 (c) 4 (d) 2

Q.408. Find the value of
$\frac{0.868 \times 0.237 + 0.868 \times 0.763}{0.7 \times 0.936 + 0.7 \times 0.064}$
RRB NTPC 13/01/2021 (Evening)
(a) 0.124 (b) 12.4 (c) 1.42 (d) 1.24

Q.409. Find the value of
$(\frac{\sqrt{3}-1}{\sqrt{3}+1} + \frac{\sqrt{3}+1}{\sqrt{3}-1} + \frac{2-\sqrt{3}}{2+\sqrt{3}} + \frac{2+\sqrt{3}}{2-\sqrt{3}})$.
RRB NTPC 13/01/2021 (Evening)
(a) 18 (b) 14 (c) 20 (d) 16

Q.410. If x is the closest approximation to the product 0.3333 x 0.25 x 0.499 x 0.125 x 24 , then find the value of x.
RRB NTPC 16/01/2021 (Morning)
(a) $\frac{3}{8}$ (b) $\frac{1}{8}$ (c) $\frac{3}{4}$ (d) $\frac{2}{5}$

Q.411. If a : b = $\sqrt{7} : \sqrt{3}$ then the value of (3a + 2b) : (3a - 2b) is equal to:
RRB NTPC 16/01/2021 (Evening)
(a) $\frac{2+\sqrt{21}}{(2-\sqrt{21})}$ (b) $\frac{2+\sqrt{21}}{(-2+\sqrt{21})}$
(c) $\frac{2+\sqrt{21}}{(-2-\sqrt{21})}$ (d) $\frac{2-\sqrt{21}}{(2+\sqrt{21})}$

Q.412. The value of $8 + (\frac{1}{2} + \frac{1}{4}) \times 16$ is
RRB NTPC 16/01/2021 (Evening)
(a) 10 (b) 4 (c) 20 (d) 35

Q.413. If $\sqrt{45} + \sqrt{125}$ = 17.88 then what will be the value of $\sqrt{180} + \sqrt{80}$?
RRB NTPC 17/01/2021 (Morning)
(a) 21.6 (b) 22.35 (c) 13.4 (d) 22.2

Q.414. Select the number that can replace the question mark (?) in the following equation.
? + $\frac{18}{24}$ + $3\frac{3}{4} = 23\frac{13}{24}$
RRB NTPC 17/01/2021 (Morning)
(a) $19\frac{13}{24}$ (b) $19\frac{11}{24}$ (c) 1 (d) $19\frac{1}{24}$

Q.415. The value of 987 × 999 is..
RRB NTPC 17/01/2021 (Morning)
(a) 986013 (b) 980613
(c) 996023 (d) 976023

Q.416. If (1 + 2 + x) - (0.12 - 0.42 + 0.94) = 4, then what will be the value of x ?
RRB NTPC 17/01/2021 (Morning)
(a) 1.64 (b) 1.54 (c) 2.64 (d) 2.54

Q.417. Select the option that will replace the question mark (?) in the given equation.
? + $\frac{18}{24} + 3\frac{3}{4} = 23\frac{13}{24}$
RRB NTPC 17/01/2021 (Evening)
(a) 0 (b) $19\frac{1}{24}$ (c) 1 (d) $19\frac{13}{24}$

Q.418. Simplify $(1^3 + 2^3 + 3^3 + \ldots + 8^3)^{\frac{-5}{2}}$
RRB NTPC 17/01/2021 (Evening)
(a) 10^3 (b) 6^{-10} (c) $36^{-7.5}$ (d) $8^{-7.5}$

Q.419. Solve the following :
11 + 11 ÷ 11 + 11 x 11 - 11 = ?
RRB NTPC 17/01/2021 (Evening)
(a) 1 (b) $\frac{13}{11} - 11$ (c) 0 (d) 122

Q.420. Solve the following
$(625)^{0.17}$ x $(625)^{0.08}$ = ?
RRB NTPC 17/01/2021 (Evening)
(a) 1 (b) 25 (c) 5 (d) 2.5

Q.421. If $\frac{9^m \times 3^5 \times 27^3}{3 \times 81^4} = 3^9$, then the value of m is:
RRB NTPC 17/01/2021 (Evening)
(a) 5 (b) 7 (c) 6 (d) 12

Q.422. Write the ratios 5 : 3, 7 : 5, 6 : 4 in descending order.
RRB NTPC 18/01/2021 (Morning)
(a) $\frac{5}{3} > \frac{6}{4} > \frac{7}{5}$ (b) $\frac{5}{3} > \frac{7}{5} > \frac{6}{4}$
(c) $\frac{7}{5} > \frac{6}{4} > \frac{5}{3}$ (d) $\frac{6}{4} > \frac{7}{5} > \frac{5}{3}$

Q.423. If $\frac{3x}{2y} = \frac{48}{72}$ then $\frac{x}{y}$ in its lowest term is :
RRB NTPC 18/01/2021 (Morning)
(a) $\frac{4}{9}$ (b) $\frac{5}{9}$ (c) $\frac{3}{9}$ (d) $\frac{2}{9}$

Q.424. The value of $(\frac{32}{5}) \times 92 + (\frac{3}{5}) \times$ is
RRB NTPC 18/01/2021 (Evening)
(a) 401 (b) 590 (c) 812 (d) 502

Q.425. What is the value of the following expression ?
$\frac{\sqrt{7}-\sqrt{3}}{\sqrt{7}+\sqrt{3}} + \frac{\sqrt{7}+\sqrt{3}}{\sqrt{7}-\sqrt{3}} + \frac{\sqrt{3}+1}{\sqrt{3}-1} + \frac{\sqrt{3}-1}{\sqrt{3}+1}$
RRB NTPC 18/01/2021 (Evening)
(a) 1 (b) 9 (c) $\frac{1}{2}$ (d) 0

Q.426. What is the value of the following expression ?
$\frac{(2.7)^2-(0.8)^2}{2.7 - 0.8}$
RRB NTPC 18/01/2021 (Evening)
(a) 0 (b) 7.0 (c) 3.5 (d) 2.5

Q.427. Which of the following options is equivalent to
$\frac{(x^3-y^3)(x^2+5x+6)(x^4-16)}{(x-y)(x+3)(x-2)(x^2+4)}$ = ?
RRB NTPC 18/01/2021 (Evening)
(a) $(x^2 + y^2 - xy)$ (b) $(x^2+ y^2 - xy)(x + 2)^2$
(c) $(x + 2)^2$ (d) $(x^2 + y^2 + xy)(x + 2)^2$

Q.428. The value of $\frac{(-\frac{1}{2})^5}{(-\frac{1}{2})^4}$ + is
RRB NTPC 19/01/2021 (Morning)
(a) 3 (b) 2 (c) 1 (d) 0

Q.429. If $\sqrt{15}$ = 3.88, then $\sqrt{\frac{5}{3}}$ = ?
RRB NTPC 19/01/2021 (Morning)
(a) $4.29\overline{3}$ (b) $2.29\overline{3}$ (c) $3.29\overline{3}$ (d) $1.29\overline{3}$

Q.430. Find the value of $\sqrt{2025}$.
RRB NTPC 19/01/2021 (Morning)
(a) 25 (b) 45 (c) 55 (d) 65

Q.431. $(\sqrt{2} + \sqrt{3})(\sqrt{2} - \sqrt{3})$ is equal to:
RRB NTPC 19/01/2021 (Evening)
(a) 2 (b) -3 (c) -1 (d) 3

Q.432. The value of $\sqrt{8} + \sqrt{18}$ is:
RRB NTPC 19/01/2021 (Evening)
(a) $\sqrt{26}$ (b) 12 (c) $5\sqrt{2}$ (d) $2(\sqrt{2} + \sqrt{3})$

Q.433. Solve the following:
$(\sqrt{3} - \sqrt{2}) \times (\sqrt{3} + \sqrt{2})$ = ?
RRB NTPC 20/01/2021 (Evening)
(a) 2 (b) 3 (c) $(\sqrt{3} + \sqrt{2})$ (d) 1

Q.434. The value of $\frac{32 \div 4 - 5 \times 8 \div 3}{5 \times 3 - \{6 + 3\}}$ is:
RRB NTPC 21/01/2021 (Morning)
(a) $-\frac{8}{9}$ (b) $\frac{1}{9}$ (c) $\frac{8}{9}$ (d) $\frac{4}{9}$

Q.435. What is the value of $\sqrt{\frac{1.21 \times 0.9}{1.1 \times 0.11}}$
RRB NTPC 21/01/2021 (Morning)
(a) 12 (b) 3 (c) 6 (d) 9

Q.436. The value of
$\frac{\{(13)^3 - 4^3\}}{13 - 8 \div 2} \div 8 - \{2 + 6 \times 9\}$ is
RRB NTPC 21/01/2021 (Morning)
(a) $-\frac{211}{8}$ (b) $\frac{685}{8}$ (c) $-\frac{217}{8}$ (d) $-\frac{685}{8}$

Q.437. What is the value of the following expression ?
$\frac{81}{7} \times \frac{21}{3} - 4\frac{2}{3} \div \frac{7}{9} \times \frac{121}{6}$
RRB NTPC 21/01/2021 (Morning)
(a) -45 (b) -40 (c) 40 (d) 45

Q.438. Find the value of:
$\sqrt{(1 + 3 + 5)(1 + 3 + 5 + 7)(1 + 3 + 5 + 7 + 9)}$
RRB NTPC 21/01/2021 (Evening)
(a) 600 (b) 300 (c) 30 (d) 60

Q.439. If $7\frac{8}{9}$ is converted into a mixed fraction and its numerator is 70 + x, then the value of x is:
RRB NTPC 21/01/2021 (Evening)
(a) 1 (b) 2 (c) 3 (d) 0

Q.440. 200 g as a fraction of 1 kg is:
RRB NTPC 21/01/2021 (Evening)
(a) $\frac{2}{5}$ (b) $\frac{1}{10}$ (c) $\frac{1}{5}$ (d) $\frac{3}{10}$

Q.441. The value of $0.\overline{23} + 0.\overline{22}$ *is*:
RRB NTPC 22/01/2021 (Morning)
(a) $0.\overline{45}$ (b) 0.45 (c) $0.\overline{43}$ (d) $0.4\overline{5}$

Q.442. Which of the following option is equal to $\sqrt{2 - \sqrt{3}}$?
RRB NTPC 22/01/2021 (Evening)
(a) $\frac{\sqrt{6}-\sqrt{2}}{2}$ (b) $\frac{2-\sqrt{3}}{2}$
(c) $\frac{\sqrt{6}-\sqrt{3}}{2}$ (d) $\frac{\sqrt{2}-\sqrt{3}}{2}$

Q.443 25.12 × 37.5 = 942. What is the value of 2512 × 0.00375 ?
RRB NTPC 22/01/2021 (Evening)
(a) 0.0942 (b) 9.42 (c) 94.2 (d) 0.942

Q.444. The value of $3 \div 1 - 2 + 3$ is:
RRB NTPC 22/01/2021 (Evening)
(a) 4 (b) -1 (c) 7 (d) -3

Q.445. If $\frac{121}{0.121} = \frac{12.1}{x}$, then the value of x will be :
RRB NTPC 23/01/2021 (Evening)
(a) 0.0121 (b) 0.1210 (c) 1.210 (d) 0.1121

Q.446. Simplify the following.
$\frac{289 \times 289 \times 289 + 111 \times 111 \times 111}{289 \times 289 - 289 \times 111 + 111 \times 111}$
RRB NTPC 23/01/2021 (Evening)
(a) 400 (b) 0 (c) 289 (d) 300

Q.447. The square root of
$\frac{(3\frac{1}{4})^4 - (4\frac{1}{3})^4}{(3\frac{1}{4})^2 - (4\frac{1}{3})^2}$ is.
RRB NTPC 23/01/2021 (Evening)
(a) $1\frac{1}{12}$ (b) $5\frac{5}{12}$ (c) $1\frac{1}{7}$ (d) $7\frac{7}{12}$

Q.448. Solve the following.
$\frac{3}{\sqrt{0.0009}} + \frac{4}{\sqrt{0.0016}}$ = ?
RRB NTPC 23/01/2021 (Evening)
(a) $\frac{1}{200}$ (b) $\frac{1}{50}$ (c) 200 (d) 100

Q.449. $\frac{225^{0.2} \times 2\,25^{0.3}}{225^{0.6} \times 225^{0.4}}$ is equal to
RRB NTPC 23/01/2021 (Evening)
(a) 15 (b) 1.5 (c) 1/15 (d) 1/25

Q.450. Solve:
$\frac{0.6 \times 0.6 \times 0.6 + 0.7 \times 0.7 \times 0.7}{0.6 \times 0.6 - 0.42 + 0.7 \times 0.7}$ = ?
RRB NTPC 25/01/2021 (Evening)
(a) 1.3 (b) 1.5 (c) 1.4 (d) 1.6

Q.451. Express following in the simplest form: $\frac{1}{5} \div (\frac{5}{3} \times \frac{3}{25})$
RRB NTPC 25/01/2021 (Evening)
(a) 0 (b) 1 (c) 3 (d) 2

Q.452. Solve the following:
$\sqrt{7 + \sqrt{7 + \sqrt{7 + \sqrt{7 + \ldots}}}}$
RRB NTPC 25/01/2021 (Evening)
(a) $\frac{1 \pm \sqrt{31}}{2}$ (b) $\frac{1 \pm \sqrt{29}}{2}$
(c) $\frac{1 \pm \sqrt{30}}{2}$ (d) $\frac{1 \pm \sqrt{28}}{2}$

Q.453. Solve the following
64.916 + 1.456 - 25.326 = ?
RRB NTPC 27/01/2021 (Morning)
(a) 41.46 (b) 40.46 (c) 41.046 (d) 40.04

Q.454. Solve the following:
$25 + [20 - \{2((20 \times \frac{1}{5}) \div \frac{1}{8} \times \frac{1}{16} - 8)\}]$ = ?
RRB NTPC 27/01/2021 (Morning)
(a) 26 (b) 57 (c) 27 (d) 37

Q.455. Simplify the following.
$\frac{1}{\sqrt{2}+\sqrt{1}} + \frac{1}{\sqrt{3}+\sqrt{2}} + \frac{1}{\sqrt{4}+\sqrt{3}} + \ldots + \frac{1}{\sqrt{100}+\sqrt{99}}$
RRB NTPC 27/01/2021 (Morning)
(a) 4 (b) 10 (c) 9 (d) 3

Q.456. Simplify the expression
$(\sqrt{81} + \sqrt{0.81} + \sqrt{0.0081})\sqrt{10000}$.

RRB NTPC 27/01/2021 (Evening)
(a) 9.99 (b) 99.9 (c) 999 (d) 0.999

Q.457. Find the value of m in
$(\frac{2}{7})^{-3} \times (\frac{2}{7})^{-5} = (\frac{2}{7})^{-3m+1}$
RRB NTPC 27/01/2021 (Evening)
(a) 5 (b) 3 (c) -2 (d) -3

Q.458. Simplify the given expression
$4\frac{1}{10} - [\{(2\frac{1}{2} - \frac{5}{6} - \frac{2}{5} + \frac{3}{10})\}]$
RRB NTPC 28/01/2021(Morning)
(a) $\frac{19}{15}$ (b) $\frac{12}{25}$ (c) $\frac{26}{15}$ (d) $\frac{31}{25}$

Q.459. Using BODMAS, simplify the following.
$\frac{7}{9} \times \frac{21}{5} \times 25\,(65^2 - 55^2)$
RRB NTPC 28/01/2021(Morning)
(a) 98000 (b) 84000 (c) 86000 (d) 42000

Q.460. Simplify the following.
5 × 0.5 × 0.05 × 0.005 × 500
RRB NTPC 28/01/2021(Morning)
(a) 3125 (b) 0.3125
(c) 31.25 (d) 0.003125

Q.461. What smallest fraction should be added to $3\frac{2}{3} + 6\frac{7}{12} + 4\frac{9}{36} + 5 + 7\frac{1}{12}$ to make the sum a whole number?
RRB NTPC 28/01/2021(Morning)
(a) $\frac{13}{12}$ (b) $\frac{5}{12}$ (c) $\frac{11}{12}$ (d) $\frac{7}{12}$

Q.462. Solve the following.
(0.032 x 0.0032) + 0.00032 = ?
RRB NTPC 29/01/2021 (Morning)
(a) 0.0004221 (b) 0.00004224
(c) 0.004224 (d) 0.0004224

Q.463. Find the value of $\frac{7^{\frac{1}{5}}}{7^{\frac{1}{3}}}$
RRB NTPC 29/01/2021 (Morning)
(a) $7^{\frac{5}{3}}$ (b) $7^{\frac{3}{5}}$ (c) $7^{\frac{4}{15}}$ (d) $7^{-\frac{2}{15}}$

Q.464. Find the value of
$\frac{(3.17 + 9.12)^2 + (3.17 - 9.12)^2}{3.17 \times 3.17 + 9.12 \times 9.12}$.
RRB NTPC 29/01/2021 (Evening)
(a) 2 (b) 3 (c) 1 (d) 4

Q.465. The value of $3.1\overline{4}$ is:
RRB NTPC 29/01/2021 (Evening)
(a) $3\frac{12}{90}$ (b) $3\frac{13}{90}$ (c) $3\frac{14}{90}$ (d) $3\frac{11}{90}$

Q.466. Simplify the given expression using BODMAS.
$\frac{4}{11} \times \frac{121}{16} \times 24(75^2 - 55^2) \times \frac{1}{100}$
RRB NTPC 30/01/2021 (Morning)
(a) 1746 (b) 1716 (c) 1736 (d) 1726

Q.467. Simplify the given expression.
$9 \times 0.9 \times 0.09 \times 0.009 \times \frac{1}{0.3} \times \frac{1}{0.03} \times \frac{1}{0.003}$
RRB NTPC 30/01/2021 (Morning)
(a) 24.3 (b) 0.243 (c) 243 (d) 2.43

Q.468. Simplify the given expression.
$\frac{5+5\times5}{5\times5+5} \times \frac{\frac{1}{5} \div (\frac{1}{5} \times \frac{1}{5})}{(\frac{1}{5} \times \frac{1}{5}) \div \frac{1}{5}} - (5 - \frac{1}{5}) \times \frac{10}{2}$
RRB NTPC 30/01/2021 (Morning)
(a) 1 (b) 0 (c) 2 (d) 3

Q.469. When 0.434343.... is converted into a fraction, then the result will be ?
RRB NTPC 30/01/2021 (Evening)
(a) $\frac{43}{100}$ (b) $\frac{4.3}{0.1}$ (c) $\frac{43}{9.9}$ (d) $\frac{43}{99}$

Q.470. Solve the following:
176 + 17.6 + 1.76 + 0.176 + 0.0176 = ?
RRB NTPC 31/01/2021 (Morning)
(a) 195.5536 (b) 195.5556
(c) 195.5356 (d) 195.5336

Q.471. What is the sum of $\frac{5}{2}$ and $\frac{2}{5}$?
RRB NTPC 31/01/2021 (Morning)
(a) $\frac{20}{7}$ (b) $\frac{7}{7}$ (c) $\frac{10}{7}$ (d) $\frac{29}{10}$

Q.472. Find $\sqrt{\frac{1521}{1849}}$
RRB NTPC 01/02/2021 (Morning)
(a) $\frac{32}{33}$ (b) $\frac{39}{43}$ (c) $\frac{37}{56}$ (d) $\frac{29}{23}$

Q.473. What will the value of the following expression be ?
$(\frac{6+3}{3}) - 5 \times (4 + 5)$
RRB NTPC 01/02/2021 (Evening)
(a) 24 (b) - 42 (c) - 24 (d) 42

Q.474. What is the value of $\frac{4+\sqrt{2}}{\sqrt{2}+1}$?
RRB NTPC 01/02/2021 (Evening)
(a) $2 - 3\sqrt{2}$ (b) $3\sqrt{2} - 2$ (c) $3\sqrt{2}$ (d) $3\sqrt{2} + 2$

Q.475. What is the sum of $\frac{1}{3}$, $\frac{4}{3}$ and $\frac{3}{4}$?
RRB NTPC 01/02/2021 (Evening)
(a) 2 (b) $\frac{29}{12}$ (c) $\frac{27}{12}$ (d) $\frac{26}{12}$

Q.476. If $\sqrt{2916}$ = 54 Then what is the value of the following ?
$\sqrt{29.16} + \sqrt{0.2916} + \sqrt{0.002916} + \sqrt{0.00002916}$
RRB NTPC 01/02/2021 (Evening)
(a) 6.00 (b) 5.9994 (c) 5.90 (d) 5.999

Q.477. What will the value of the following expression be ?
20 - [15 - {4 - (8 - 6 + 3)}]
RRB NTPC 01/02/2021 (Evening)
(a) 8 (b) 4 (c) 5 (d) 6

Q.478. What is the value of the following equation ?
$\frac{\sqrt{225}}{14} \times \frac{\sqrt{196}}{22} \times \frac{\sqrt{484}}{15}$
RRB NTPC 02/02/2021 (Morning)
(a) 3 (b) 1 (c) 2 (d) 14

Q.479. What is the value of the following expression ?
$103 - [144 \div (12 \times 12) + 5 + 12 \div (6 - 2) + 10]$
RRB NTPC 02/02/2021 (Morning)
(a) 86 (b) 90 (c) 85 (d) 84

Q.480. The value of $\frac{(5.4)^3 - 0.064}{(5.4)^2 + 2.16 + 0.16}$ is:
RRB NTPC 02/02/2021 (Morning)
(a) 8 (b) 5 (c) 3 (d) 3.6

Q.481. The value of
$\sqrt{10 + \sqrt{221 + \sqrt{12 + \sqrt{16}}}}$ is:
RRB NTPC 02/02/2021 (Morning)
(a) 3 (b) 6 (c) 5 (d) 4

Q.482. The value of $\sqrt{0.04} + \sqrt{1.44} + \sqrt{1.69} + \sqrt{0.0009}$ is:
RRB NTPC 02/02/2021 (Morning)
(a) 1.70 (b) 2.73 (c) 10.3 (d) 2.03

Q.483. If the value of $\frac{1}{36.18}$ is 0.0276, then what is the value of $\frac{1}{0.0003618}$?
RRB NTPC 02/02/2021 (Evening)
(a) 2760 (b) 276.0 (c) 27.60 (d) 2.76

Q.484. What is the value of
$\frac{7}{9} - \frac{11}{12} + \frac{13}{16} - \frac{1}{8}$ = ?
RRB NTPC 02/02/2021 (Evening)
(a) $\frac{79}{144}$ (b) $\frac{150}{144}$ (c) $\frac{144}{79}$ (d) $\frac{34}{144}$

Q.485. What is the value of $\frac{(6 \times 2)}{(8 - 1 + 5)}$?
RRB NTPC 02/02/2021 (Evening)
(a) 1 (b) 6 (c) 2 (d) 9

Q.486. What will be the value of the following expression ?
0.25 ÷ 0.0025 x 0.025 x 25
RRB NTPC 03/02/2021 (Evening)
(a) 625 (b) 62.5 (c) 0.625 (d) 6.25

Q.487. Find the quotient of 0.5 ÷ 0.71 (correct to 3 decimal places).
RRB NTPC 03/02/2021 (Evening)
(a) 0.714 (b) 0.706 (c) 0.704 (d) 0.705

Q.488. Which fraction bears the same ratio to $\frac{1}{27}$ as $\frac{3}{11}$ does to $\frac{5}{9}$?
RRB NTPC 03/02/2021 (Evening)
(a) $\frac{1}{15}$ (b) $\frac{1}{99}$ (c) $\frac{1}{27}$ (d) $\frac{1}{55}$

Q.489. What is the value of $\frac{\sqrt{5}+1}{\sqrt{5}-1}$?
RRB NTPC 03/02/2021 (Evening)
(a) $\frac{3-\sqrt{5}}{2}$ (b) $\frac{\sqrt{5}}{2}$ (c) $\frac{3\sqrt{5}}{2}$ (d) $\frac{3+\sqrt{5}}{2}$

Q.490. Which of the following options gives the value of $1999^2 - 999^2$?
RRB NTPC 03/02/2021 (Evening)
(a) 3000000 (b) 2988000
(c) 2998000 (d) 1000000

Q.491. $0.5\overline{32}$ is equivalent to the fraction.
RRB NTPC 04/02/2021 (Evening)
(a) $\frac{537}{990}$ (b) $\frac{572}{990}$ (c) $\frac{32}{99}$ (d) $\frac{527}{990}$

Q.492. Find the value of
18 - [6 - {4 - (8 - (6 + 3)}]
RRB NTPC 05/02/2021 (Morning)
(a) 3 (b) 11 (c) 6 (d) 17

Q.493. Simplification of
$\frac{0.2 \times 0.2 + 0.02 \times 0.02 - 0.4 \times 0.02}{0.36}$
gives:
RRB NTPC 09/02/2021 (Morning)
(a) 2 (b) 0.09 (c) 3.195 (d) 2.199

Q.494. The value of
$\sqrt{16 + \sqrt{80 + \sqrt{5000 - 4999}}}$ is
RRB NTPC 11/02/2021 (Morning)
(a) 1 (b) 5 (c) 50 (d) 25

Q.495. Find the value of
$4 - \cfrac{5}{1+\cfrac{1}{3+\cfrac{1}{2+\frac{1}{4}}}}$
RRB NTPC 11/02/2021 (Morning)
(a) $\frac{1}{8}$ (b) $\frac{1}{4}$ (c) $\frac{2}{9}$ (d) $\frac{8}{3}$

Q.496. Find the value of $\frac{1}{1+\frac{1}{3}} - \frac{1}{1+\frac{1}{2}}$.
RRB NTPC 11/02/2021 (Evening)
(a) $\frac{1}{12}$ (b) $\frac{1}{6}$ (c) $\frac{-1}{6}$ (d) $\frac{1}{3}$

Q.497. The value of $\left(\frac{2020}{2000}\right)^{-2008} \times \left(\frac{2020}{2000}\right)^{2008} \times 2020$
RRB NTPC 12/02/2021 (Morning)
(a) 0 (b) 220 (c) 2020 (d) 2220

Q.498. Find the value of
$\frac{0.5 \times 0.5 + 0.09 - 0.15}{0.125 + 0.027}$?
RRB NTPC 15/02/2021 (Evening)
(a) $\frac{4}{5}$ (b) $\frac{5}{4}$ (c) $\frac{5}{6}$ (d) $\frac{3}{4}$

Q.499. Solve the following:
$\frac{4+3 \times 3-2}{4-3 \times (3-2)}$
RRB NTPC 16/02/2021 (Morning)
(a) 12 (b) 2 (c) 11 (d) 10

Q.500. Find the value of
$2.\overline{43} - 3.\overline{04} + 4.\overline{44}$
RRB NTPC 16/02/2021 (Morning)
(a) 3.63 (b) 3.60 (c) 3.83 (d) $3.\overline{83}$

Q.501. The square root of $1\frac{11}{25}$ is:
RRB NTPC 16/02/2021 (Morning)
(a) $2\frac{1}{5}$ (b) $1\frac{3}{5}$ (c) $1\frac{1}{5}$ (d) $1\frac{2}{5}$

Q.502. The sum of $3.\overline{26} - 2.\overline{14} + 1.\overline{33}$ is :
RRB NTPC 16/02/2021 (Evening)
(a) $2.\overline{45}$ (b) $2.\overline{25}$ (c) $2.\overline{15}$ (d) $2.\overline{55}$

Q.503. Solve the given equation.
$\sqrt{12321} \times \sqrt{?} = 13431$
RRB NTPC 16/02/2021 (Evening)
(a) 14631 (b) 14541 (c) 14641 (d) 14621

Q.504. Solve the following.
$8 \div 8 \times \frac{8+8}{8 \div 8 \times 8 + 8} = ?$
RRB NTPC 17/02/2021 (Morning)
(a) 64 (b) 128 (c) $\frac{1}{128}$ (d) 1

Q.505. If $\frac{a}{b} = 0.25$, then the value of
$\left(\frac{2a-b}{2a+b}\right) + \frac{2}{9}$ is
RRB NTPC 17/02/2021 (Morning)
(a) $\frac{4}{9}$ (b) $\frac{5}{9}$ (c) $-\frac{2}{9}$ (d) $-\frac{1}{9}$

Q.506. What is the value of $1 - \left(\frac{5}{6}\right)^2$?
RRB NTPC 17/02/2021 (Evening)
(a) $\frac{1}{6}$ (b) $\frac{11}{36}$ (c) $\frac{1}{36}$ (d) $\frac{4}{9}$

Q.507. 19 × 19 = 361. What will be the value of 190 × 0.0019 ?
RRB NTPC 17/02/2021 (Evening)
(a) 0.00361 (b) 3.61 (c) 0.361 (d) 0.0361

Q.508. Find the value of x.
if $\frac{52}{x} = \sqrt{\frac{169}{289}}$?
RRB NTPC 22/02/2021 (Morning)
(a) 62 (b) 58 (c) 52 (d) 68

Q.509. If $x = \frac{1}{\sqrt{2}+1}$ then what will be the value of x + 1?
RRB NTPC 22/02/2021 (Morning)
(a) $\sqrt{2} - 1$ (b) 2 (c) $\sqrt{2}$ (d) $\sqrt{2} + 1$

Q.510. Express the decimal number $3.12\overline{7}$ in fraction form.
RRB NTPC 22/02/2021 (Morning)
(a) $\frac{180}{563}$ (b) $\frac{563}{180}$ (c) $\frac{281}{900}$ (d) $\frac{365}{180}$

Q.511. If y = 5, then what will be the value of $10y\sqrt{y^3 - y^2}$?
RRB NTPC 22/02/2021 (Morning)
(a) 500 (b) $50\sqrt{2}$ (c) 100 (d) $200\sqrt{5}$

Q.512. What number must be subtracted from both the numerator and denominator of the fraction $\frac{15}{19}$ so as to make it $\frac{3}{4}$?
RRB NTPC 22/02/2021 (Morning)
(a) 6 (b) 3 (c) 9 (d) 5

Q.513. How will you write 3.33 hours in hours, minutes and seconds ?
RRB NTPC 22/02/2021 (Evening)
(a) 3 hours, 19 minutes, 48 seconds
(b) 3 hours, 30 minutes, 3 seconds
(c) 3 hours, 33 minutes
(d) 3 hours, 30 minutes, 30 seconds

Q.514. If $a \times b = a + b + \left(\sqrt{\frac{a}{b}}\right) + \sqrt{(ab)}$, then what will be the value of 16 × 4 ?
RRB NTPC 22/02/2021 (Evening)
(a) 32 (b) 28 (c) 30 (d) 26

Q.515. Solve the following.
$3.\overline{36} - 2.\overline{05} + 1.\overline{33} = ?$
RRB NTPC 22/02/2021 (Evening)
(a) $2.\overline{63}$ (b) $2.\overline{64}$ (c) $2.\overline{60}$ (d) $2.\overline{61}$

Q.516. If $x^{11} = y^0$ and x = 2y, then y is equal to:
RRB NTPC 22/02/2021 (Evening)
(a) 1 (b) -1 (c) -2 (d) $\frac{1}{2}$

Q.517. Which of the following fractions is the smallest ?
RRB NTPC 23/02/2021 (Morning)
(a) $\frac{7}{8}$ (b) $\frac{7}{10}$ (c) $\frac{5}{7}$ (d) $\frac{3}{4}$

Q.518. If $\sqrt{x} + 10 = \sqrt{529}$, then the value of x is;
RRB NTPC 23/02/2021 (Morning)

(a) 166 (b) 169 (c) 168 (d) 167

Q.519. Find the value of
$\frac{(74+47)^2+(74-47)^2}{74^2+47^2}$
RRB NTPC 23/02/2021 (Morning)
(a) 2 (b) 47 (c) 1 (d) 74

Q.520. The value of $0.\overline{56} + 0.\overline{43} + 0.\overline{89}$ is:
RRB NTPC 23/02/2021 (Morning)
(a) $1.\overline{98}$ (b) $1.\overline{87}$ (c) $1.\overline{89}$ (d) $1.\overline{88}$

Q.521. If $\sqrt{15 \times 27 \times x}$ = 180, then x is equal to :
RRB NTPC 23/02/2021 (Morning)
(a) 70 (b) 50 (c) 80 (d) 60

Q.522. If $\sqrt{0.03 \times 0.3 \times p}$ = 0.3 × 0.03 × $\sqrt{q}$, then $\frac{p}{q}$ is :
RRB NTPC 27/02/2021 (Morning)
(a) 0.09 (b) 0.009 (c) 0.0009 (d) 0.9

Q.523. The value of $\frac{(0.3)^4-(0.2)^4}{(0.3)^2+(0.2)^2}$ is:
RRB NTPC 27/02/2021 (Morning)
(a) 0.05 (b) 0.15 (c) 0.51 (d) 0.5

Q.524. Find the value of
$\frac{1}{2\times4}+\frac{1}{4\times6}+\frac{1}{6\times8}+\ldots\ldots+\frac{1}{48\times50}$.
RRB NTPC 27/02/2021 (Evening)
(a) 0.48 (b) 0.42 (c) 0.46 (d) 0.24

Q.525. If 0.17 ÷ p² = 17, then the value of p is:
RRB NTPC 27/02/2021 (Evening)
(a) 0.001 (b) 1 (c) 0.1 (d) 0.01

Q.526. Find the value of
$\frac{(19\times9+31\times10+32\times11)}{(233.25\times2-50)}$?
RRB NTPC 01/03/2021 (Morning)
(a) 2 (b) 4 (c) 6 (d) 8

Q.527. If $\frac{5+2\sqrt{3}}{2-\sqrt{3}} = x + y\sqrt{3}$, then (x ,y) = ?
RRB NTPC 01/03/2021 (Morning)
(a) (4, 9) (b) (2, 3) (c) (9, 16) (d) (16, 9)

Q.528. The value of
$\frac{(3\frac{1}{5}-\frac{3}{5})\div\frac{8}{5}}{1\frac{1}{7}\div\{\frac{1}{7}-(\frac{1}{7}\div\frac{1}{5})\}}$ is.
RRB NTPC 01/03/2021 (Evening)
(a) $\frac{13}{16}$ (b) $-\frac{13}{16}$ (c) $\frac{3}{16}$ (d) $-\frac{1}{16}$

Q.529. Find the value of x.
$\frac{(17)^3+7^3}{(17)^2+7^2-x}$ = 24
RRB NTPC 01/03/2021 (Evening)
(a) x = 127 (b) x = 117
(c) x = 119 (d) x = 121

Q.530. Find the positive value of the following square root
$\sqrt{56+\sqrt{56+\sqrt{56+\ldots\ldots}}}$ = ?
RRB NTPC 02/03/2021 (Morning)
(a) 4 (b) 8 (c) 12 (d) 56

Q.531. By how much is $\frac{4}{5}$th of 3500 more than $\frac{1}{3}$rd of 6000 ?
RRB NTPC 02/03/2021 (Morning)
(a) 2800 (b) 2000 (c) 1800 (d) 800

Q.532. Evaluate the following.
$\frac{2+\sqrt{5}}{2-\sqrt{5}}+\frac{2-\sqrt{5}}{2+\sqrt{5}}+\frac{\sqrt{5}-1}{\sqrt{5}+1}$
RRB NTPC 02/03/2021 (Evening)
(a) $\frac{-31-\sqrt{5}}{2}$ (b) $\frac{-33-\sqrt{5}}{2}$
(c) $\frac{-32-\sqrt{5}}{2}$ (d) $\frac{-35-\sqrt{5}}{2}$

Q.533. Solve the following
$4\frac{1}{3}\times2\frac{4}{5}\div2\frac{1}{3}$ = ?
RRB NTPC 03/03/2021 (Morning)
(a) $6\frac{1}{5}$ (b) $5\frac{1}{5}$ (c) $6\frac{6}{5}$ (d) $1\frac{6}{5}$

Q.534. If 65 × 65 = 4225, then the value of 6.5 × 6.5 = ?
RRB NTPC 03/03/2021 (Morning)
(a) 42.25 (b) 42025
(c) 422.5 (d) 0.004225

Q.535. Find the value of
$777\frac{1}{5}+777\frac{2}{5}+777\frac{3}{5}+777\frac{4}{5}$.
RRB NTPC 03/03/2021 (Morning)
(a) 3110 (b) 3018 (c) 3000 (d) 3108

Q.536. Simplify .
$\frac{320\div8\times8\div4\times\frac{1}{2}}{180\times5\div45-4}$
RRB NTPC 03/03/2021 (Evening)
(a) $\frac{2}{5}$ (b) 10 (c) $\frac{5}{2}$ (d) $\frac{5}{8}$

Q.537. Simplify. 9 + (45 ÷ 9) - 8 × (-4)
RRB NTPC 03/03/2021 (Evening)
(a) 46 (b) -171 (c) 38 (d) 8

Q.538. The value of
$\{\frac{3}{5}\times[3+\{3+(11+5+6)\}]\}$ is:
RRB NTPC 04/03/2021 (Morning)
(a) $12\frac{6}{5}$ (b) $16\frac{4}{5}$ (c) $11\frac{4}{5}$ (d) $10\frac{2}{5}$

Q.539. The value of
27 × 4.15 + 30.8 ÷ 22 is:
RRB NTPC 04/03/2021 (Morning)
(a) 113.45 (b) 110.25
(c) 126.05 (d) 149.85

Q.540. If $(3^x)(3^y)$ = 9 and $(25^x)(5^y)$ = 625, then what is (x, y) ?
RRB NTPC 04/03/2021 (Morning)
(a) (2, 4) (b) (2, 0) (c) (3, -5) (d) (1, 2)

Q.541. The square root of 182.25 is:
RRB NTPC 04/03/2021 (Morning)
(a) 13.5 (b) 12.5 (c) 11.25 (d) 9.25

Q.542. The value of
$\frac{(56+34)^2-(56-34)^2}{4\times56\times34}$ is:
RRB NTPC 04/03/2021 (Morning)
(a) 2 (b) 1 (c) 3 (d) 0

Q.543. Find the value of $\frac{119.5^2-116.4^2}{(119.5-116.4)}$.
RRB NTPC 04/03/2021 (Evening)
(a) 235.1 (b) 217.9 (c) 3.1 (d) 235.9

Q.544. Find the value of $(22+8\sqrt{6})^{\frac{1}{2}}$.
RRB NTPC 04/03/2021 (Evening)
(a) 4 - $\sqrt{6}$ (b) 16 + 2$\sqrt{6}$
(c) 8 + 2$\sqrt{6}$ (d) 4 + $\sqrt{6}$

Q.545. By how much is $\frac{2}{3}$ of 3000 more than $\frac{2}{5}$ of 1500 ?
RRB NTPC 04/03/2021 (Evening)
(a) 1500 (b) 1400 (c) 1000 (d) 2000

Q.546. If $\sqrt{625}\div\sqrt{x}=\frac{1}{5}$, then x = ?
RRB NTPC 04/03/2021 (Evening)
(a) 125 (b) 15625 (c) 3125 (d) 1225

Q.547. If $\sqrt{484\sqrt{25\div x}}=22$, then x = _____.
RRB NTPC 04/03/2021 (Evening)
(a) 25 (b) 100 (c) 75 (d) 50

Q.548. The value of $\sqrt{142884}$ is:
RRB NTPC 05/03/2021 (Morning)
(a) 358 (b) 378 (c) 368 (d) 388

Q.549. Solve the given equation.
$\sqrt{(544)^2-(256)^2}$
RRB NTPC 05/03/2021 (Morning)
(a) 144 (b) 288 (c) 480 (d) 400

Q.550. Convert $\frac{8}{9}$ into a decimal number.
RRB NTPC 05/03/2021 (Evening)
(a) 0.85 (b) 0.88 (c) 0.77 (d) 0.91

Q.551. Solve the following
$\sqrt[3]{\sqrt{0.000064}}$ = ?
RRB NTPC 05/03/2021 (Evening)
(a) 0.2 (b) 2.0 (c) 0.02 (d) 0.002

Q.552. If $\sqrt{7}$ = 2.6, then the value of $\frac{5\sqrt{7}}{4\sqrt{7}-0.4}$ is:
RRB NTPC 05/03/2021 (Evening)
(a) 1.2 (b) 1.1 (c) 1.5 (d) 1.3

Q.553. Which of the following fractions are in ascending orde r?
RRB NTPC 05/03/2021 (Evening)
(a) $\frac{16}{19}, \frac{14}{17}, \frac{12}{18}$ (b) $\frac{12}{18}, \frac{14}{17}, \frac{16}{19}$
(c) $\frac{12}{18}, \frac{16}{19}, \frac{14}{17}$ (d) $\frac{14}{17}, \frac{12}{18}, \frac{16}{19}$

Q.554. Given that a = $\sqrt{4}$, then the value of the following.
$\sqrt{9} + 25a + \sqrt{64}$
RRB NTPC 05/03/2021 (Evening)
(a) 51 (b) 31 (c) 41 (d) 61

Q.555. If x = $\frac{\sqrt{9}+1}{\sqrt{9}-1}$ and y = $\frac{\sqrt{16}+1}{\sqrt{16}-1}$, then the value of $(x^2 - y^2)$ is:
RRB NTPC 07/03/2021 (Morning)
(a) $\frac{11}{9}$ (b) $\frac{6}{5}$ (c) $\frac{7}{6}$ (d) $\frac{9}{8}$

Q.556. If $\sqrt{5^n} = 5$, then n = ?
RRB NTPC 07/03/2021 (Morning)
(a) 4 (b) 5 (c) 2 (d) 3

Q.557. Find the value of
18 - [6 ÷ 3 × {8 - (10 × $\frac{1}{2}$)}] .
RRB NTPC 07/03/2021 (Morning)
(a) 8 (b) 12 (c) 10 (d) 6

Q.558. $\sqrt{176 + \sqrt{2401}}$ is equal to :
RRB NTPC 07/03/2021 (Morning)
(a) 17 (b) 21 (c) 19 (d) 15

Q.559. Simplify: 0.077 ÷ 7 - 0.005 ÷ 5
RRB NTPC 07/03/2021 (Morning)
(a) 0.01 (b) 0.001 (c) 0.0001(d) 0.00001

Q.560. The value of the variable x in the equation 3 (5x + 2) - 4 = 2 (1 - 4x) is:
RRB NTPC 07/03/2021 (Evening)
(a) -1 (b) 10 (c) 2 (d) 0

Q.561. Evaluate:
{(2 - $\frac{1}{3}$) + ($\frac{2}{3}$ × 1$\frac{1}{5}$)} + $\frac{3}{5}$ × 2$\frac{5}{7}$
RRB NTPC 07/03/2021 (Evening)
(a) 2$\frac{4}{27}$ (b) 4$\frac{2}{27}$ (c) 2$\frac{4}{21}$ (d) 4$\frac{2}{21}$

Q.562. Evaluate the positive value of
$\sqrt{107 + \sqrt{192 + \sqrt{11 + \sqrt{25}}}}$
RRB NTPC 07/03/2021 (Evening)
(a) 5 (b) 14 (c) 11 (d) 15

Q.563. Evaluate : $(0.2)^3 - (0.02)^3$
RRB NTPC 07/03/2021 (Evening)
(a) 0.001002 (b) 0.002992
(c) 0.007992 (d) 0.009992

Q.564. The square root of 5$\frac{44}{49}$ is:
RRB NTPC 07/03/2021 (Evening)
(a) $\frac{12}{7}$ (b) $\frac{16}{7}$ (c) $\frac{15}{7}$ (d) $\frac{17}{7}$

Q.565. Solve the following.
$\frac{(28.4)^2 - (24.4)^2}{(28.4 - 24.4)}$ = ?
RRB NTPC 08/03/2021 (Morning)
(a) 52 (b) 8 (c) 52.8 (d) 4

Q.566. Find the positive value of
$\sqrt{12 + \sqrt{12 + \sqrt{12 + \ldots}}}$
RRB NTPC 08/03/2021 (Morning)
(a) 12 (b) 2 (c) 3 (d) 4

Q.567. Solve the following.
$\frac{7}{77}$ × 7777077 = ?
RRB NTPC 08/03/2021 (Morning)
(a) 7007007 (b) 707007
(c) 707077 (d) 707070

Q.568. The product of 0.27 and 3.54 is less than 5.743 by how much ?
RRB NTPC 08/03/2021 (Morning)
(a) 0.7558 (b) 3.89 (c) 5.742 (d) 4.7872

Q.569. If $\sqrt{5^n} = 625$, then the value of n is:
RRB NTPC 08/03/2021 (Evening)
(a) 6 (b) 7 (c) 8 (d) 9

Q.570. If $\sqrt{1 + \frac{x}{121}} = \frac{12}{11}$, then the value of x is;
RRB NTPC 08/03/2021 (Evening)
(a) 48 (b) 23 (c) 26 (d) 75

Q.571. The product of 0.4 x 0.04 x 0.004 is :
RRB NTPC 09/03/2021 (Morning)
(a) 0.00054 (b) 0.04
(c) 0.000064 (d) 0.0044

Q.572. Solve the following
$\sqrt{\frac{225}{729}} - \sqrt{\frac{25}{144}} - \sqrt{\frac{16}{81}}$ = ?
RRB NTPC 09/03/2021 (Morning)
(a) $\frac{-11}{36}$ (b) $\frac{-5}{9}$ (c) $\frac{-20}{27}$ (d) $\frac{-7}{12}$

Q.573. What is the value of the following expression : $\frac{5 \times 1.6 - 2 \times 1.4}{1.3}$
RRB NTPC 09/03/2021 (Morning)
(a) 1 (b) 2 (c) 4 (d) 3

Q.574. Which of the following fractions is the largest ?
$\frac{11}{12}, \frac{12}{13}, \frac{15}{16}, \frac{13}{14}$
RRB NTPC 09/03/2021 (Morning)
(a) $\frac{15}{16}$ (b) $\frac{12}{13}$ (c) $\frac{13}{14}$ (d) $\frac{11}{12}$

Q.575. Select the number that can replace the question mark (?) in the following equation.
0.008 ÷ ? = 0.8
RRB NTPC 09/03/2021 (Morning)
(a) 0.001 (b) 1.0 (c) 0.01 (d) 0.0001

Q.576. If $\sqrt{1296} = x^2$, then the value of x will be :
RRB NTPC 09/03/2021 (Morning)
(a) 5 (b) 7 (c) 6 (d) 4

Q.577. What decimal fraction is 180 ml of a litre ?
RRB NTPC 09/03/2021 (Morning)
(a) 0.18 (b) 0.0018 (c) 0.81 (d) 0.018

Q.578. What should be subtracted from the product of 0.527 and 2.013 to get 1 ?
RRB NTPC 09/03/2021 (Morning)
(a) 1.939085 (b) 2.060851
(c) 0.060851 (d) 0.939085

Q.579. When 0.36 is written in its simplest fractional form, the sum of the numerator and the denominator is :
RRB NTPC 09/03/2021 (Evening)
(a) 32 (b) 34 (c) 35 (d) 33

Q.580. Which of the following is equal to 3.14×10^6 ?
RRB NTPC 09/03/2021 (Evening)
(a) 31400 (b) 31400000
(c) 314000 (d) 3140000

Q.581. Find the value of
$\frac{\sqrt{144}}{7} \times \frac{14}{12} \times \frac{7}{\sqrt{196}}$.
RRB NTPC 09/03/2021 (Evening)
(a) 2 (b) 3 (c) 1 (d) 4

Q.582. Which of the following fractions is the smallest ?
RRB NTPC 09/03/2021 (Evening)
(a) $\frac{11}{12}$ (b) $\frac{8}{13}$ (c) $\frac{9}{11}$ (d) $\frac{10}{14}$

Q.583. Find the value of
$\frac{(0.03)^2 + (0.51)^2 + (0.083)^2}{(0.003)^2 + (0.051)^2 + (0.0083)^2}$.
RRB NTPC 09/03/2021 (Evening)
(a) 1000 (b) 100 (c) 10 (d) 0.1

Q.584. The value of $\frac{(3.6 \times 0.48 \times 2.50)}{(0.12 \times 0.09 \times 0.5)}$ is:
RRB NTPC 11/03/2021 (Morning)

(a) 80000 (b) 8000 (c) 80 (d) 800

Q.585. The value of

$(35.7 - (3 + \frac{1}{3 + \frac{1}{3}}) - (2 + \frac{1}{2 + \frac{1}{2}}))$ is:

RRB NTPC 11/03/2021 (Morning)

(a) 34.8 (b) 36.6 (c) 41.4 (d) 30

Q.586. The square root of $(7 + 3\sqrt{5})(7 - 3)$ is:

RRB NTPC 11/03/2021 (Morning)

(a) 4 (b) $\sqrt{5}$ (c) 2 (d) $3\sqrt{5}$

Q.587. Find the value of

$$\frac{(0.2)^3 + (0.04)^3}{(0.1)^2 \times 0.1 + (0.02) \times (0.02)^2}$$

RRB NTPC 11/03/2021 (Morning)

(a) 9 (b) 6 (c) 7 (d) 8

Q.588. Find the value of

$$\frac{564 \times 564 \times 564 - 246 \times 246 \times 246}{564 \times 564 + 564 \times 246 + 246 \times 246}$$

RRB NTPC 11/03/2021 (Evening)

(a) 664 (b) 358 (c) 700 (d) 318

Q.589. Positive value of

$\sqrt{6 + \sqrt{5 + \sqrt{12 + \sqrt{16}}}}$ is.

RRB NTPC 11/03/2021 (Evening)

(a) $\sqrt{6}$ (b) $3\sqrt{2}$ (c) $\sqrt{10}$ (d) 3

Q.590. Simplify the following :-

$0.\overline{077} \div 7.\overline{33}$

RRB NTPC 12/03/2021 (Morning)

(a) $\frac{7}{333}$ (b) $\frac{7}{666}$ (c) $\frac{7}{33}$ (d) $\frac{7}{66}$

Q.591. If $\sqrt{3^n} = \sqrt{6561}$, then the value of n is...

RRB NTPC 12/03/2021 (Morning)

(a) 6 (b) 3 (c) 8 (d) 4

Q.592. If $\sqrt{x} \div \sqrt{169} = 0.05$, then the value of x is:

RRB NTPC 12/03/2021 (Morning)

(a) 0.4115 (b) 0.4223

(c) 0.4225 (d) 0.4234

Q.593. Find the value of y from the following equation.

$\frac{396 \div 18 \times 5 - 100}{y} = 7^2 \div 8 + 3.875$

RRB NTPC 12/03/2021 (Morning)

(a) y = 2 (b) y = -2 (c) y = 1 (d) y = -1

Q.594. The value of

$\frac{3\sqrt{2}}{\sqrt{6}-\sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6}-\sqrt{2}} - \frac{6}{\sqrt{8}-\sqrt{12}}$ is

RRB NTPC 12/03/2021 (Evening)

(a) $\sqrt{3} + \sqrt{2}$ (b) $\sqrt{3} - \sqrt{2}$

(c) $5\sqrt{3}$ (d) 1

Q.595. The value of $\sqrt{217 + \sqrt{50 + \sqrt{196}}}$ is:

RRB NTPC 13/03/2021 (Morning)

(a) 14 (b) 15 (c) 25 (d) 64

Q.596. If $\sqrt{225} = 15$ then the value of $\sqrt{2.25} + \sqrt{0.0225} + \sqrt{0.000225}$ is?

RRB NTPC 13/03/2021 (Morning)

(a) 1.665 (b) 1.675 (c) 1.689 (d) 1.645

Q.597.

If $\frac{2160}{\sqrt{x}} = 240$ then the value of x is:

RRB NTPC 13/03/2021 (Morning)

(a) 100 (b) 49 (c) 81 (d) 58

Q.598. The value of $(0.2)^3 - (0.02)^3$ is:

RRB NTPC 13/03/2021 (Evening)

(a) 0.009992 (b) 0.002992

(c) 0.007992 (d) 0.001002

Q.599. The value of

$\{(2 - \frac{1}{3}) + (\frac{2}{3} \times 1\frac{1}{5})\} + \frac{3}{5} \times 2\frac{5}{7}$ is:

RRB NTPC 13/03/2021 (Evening)

(a) $4\frac{2}{27}$ (b) $4\frac{2}{21}$ (c) $2\frac{4}{21}$ (d) $2\frac{4}{27}$

Q.600.

The value of $(3\frac{1}{7} + 4\frac{3}{7}) + \frac{7}{6}$ is:

RRB NTPC 13/03/2021 (Evening)

(a) $\frac{432}{42}$ (b) $\frac{367}{42}$ (c) $\frac{267}{42}$ (d) $\frac{342}{42}$

Q.601. The value of $18[4 - 3\{6 - (8 \times \frac{1}{2})\}]$ is :

RRB NTPC 13/03/2021 (Evening)

(a) 20 (b) -36 (c) 16 (d) 36

Q.602. The square root of $5\frac{44}{49}$ is:

RRB NTPC 13/03/2021 (Evening)

(a) $\frac{16}{7}$ (b) $\frac{12}{7}$ (c) $\frac{15}{7}$ (d) $\frac{17}{7}$

Q.603.

The value of $\frac{\frac{8}{3} \div \frac{3}{5} \times \frac{7}{5}}{\frac{5}{3} \div \frac{5}{7} \times \frac{8}{9}} \div 9$ is :

RRB NTPC 14/03/2021 (Morning)

(a) $\frac{3}{5}$ (b) $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) $\frac{1}{5}$

Q.604. The number $0.124\overline{64}$ in the form $\frac{P}{q}$ is equal to :

RRB NTPC 14/03/2021 (Morning)

(a) $\frac{617}{4950}$ (b) $\frac{117}{1950}$ (c) $\frac{67}{4999}$ (d) $\frac{17}{950}$

Q.605. What is the value of x in the following equation?

$8.5 - \{5\frac{1}{2} - (7\frac{1}{2} + 2.8 \div x)\} \times 4.25 \div (0.2)^2 = 306$

RRB NTPC 14/03/2021 (Evening)

(a) 3.08 (b) 3.5 (c) 2.5 (d) 1.8

Q.606. Find the value of x.

$1\frac{1}{5} - 3\frac{2}{4} \div 1\frac{3}{4} \div (x + 3\frac{1}{8}) \div 1\frac{1}{7} = 1$

RRB NTPC 15/03/2021 (Morning)

(a) $7\frac{5}{8}$ (b) $3\frac{3}{8}$ (c) $5\frac{5}{8}$ (d) $3\frac{5}{8}$

Q.607. Find the value of $\sqrt{58\frac{7}{9}}$

RRB NTPC 15/03/2021 (Morning)

(a) $7\frac{2}{3}$ (b) $2\frac{7}{9}$ (c) $7\frac{7}{9}$ (d) $2\frac{2}{3}$

Q.608. The descending order of the fractions $\frac{2}{3}, \frac{1}{6}, \frac{1}{5}, \frac{3}{7}$ is :

RRB NTPC 15/03/2021 (Evening)

(a) $\frac{3}{7}, \frac{2}{3}, \frac{1}{6}, \frac{1}{5}$ (b) $\frac{3}{7}, \frac{1}{6}, \frac{1}{5}, \frac{2}{3}$

(c) $\frac{2}{3}, \frac{3}{7}, \frac{1}{5}, \frac{1}{6}$ (d) $\frac{1}{6}, \frac{1}{5}, \frac{3}{7}, \frac{2}{3}$

Q.609. If $\sqrt{2116 \times \sqrt{48 \div x}} = 92$, find the value of x.

RRB NTPC 15/03/2021 (Evening)

(a) 6 (b) 12 (c) 2 (d) 3

Q.610. Simplify the following. $\frac{0.0625}{0.05}$

RRB NTPC 15/03/2021 (Evening)

(a) 1.25 (b) 125 c) 0.0125 (d) 0.125

Q.611. Simplify the following

$(225 \div 25 - 10) \times 5 + 2 - 7 \times 3$

RRB NTPC 15/03/2021 (Evening)

(a) -24 (b) 84 (c) 0 (d) 56

Q.612. Solve the following.

$\frac{\sqrt{196}}{7} \times \frac{\sqrt{441}}{7} \times \frac{120}{\sqrt{225}} = ?$

RRB NTPC 15/03/2021 (Evening)

(a) 54 (b) 58 (c) 84 (d) 48

Q.613. How much does one have to add to $\frac{4}{5}$ to obtain $\frac{5}{4}$?

RRB NTPC 19/03/2021 (Morning)

(a) $\frac{9}{16}$ (b) $\frac{2}{5}$ (c) $\frac{9}{20}$ (d) $\frac{16}{25}$

Q.614. If $231 \times 326 = 75306$. then what is the value of 2.31×0.326?

RRB NTPC 19/03/2021 (Morning)

(a) 0.75306 (b) 7.5306

(c) 75.306 (d) 0.075306

Q.615. The number 0.1235235235 in the $\frac{p}{q}$ form is equal to:

RRB NTPC 19/03/2021 (Evening)

(a) $\frac{1}{12352}$ (b) $\frac{127}{12352}$
(c) $\frac{617}{4995}$ (d) $\frac{100}{12525}$

Q.616. If A is 55, Z is 11, H is 5 and D is 5, then find the value of $A \div Z \times H - D$
RRB NTPC 19/03/2021 (Evening)
(a) 20 (b) 25 (c) 55 (d) -4

Q.617. Solve the following expression:
3 × 0.3 × 0.03 × 0.003 × 300
RRB NTPC 21/03/2021 (Morning)
(a) 24.30 (b) 0.0243 (c) 2.430 (d) 0.2430

Q.618. Evaluate: 6 ÷ [5 - {4 - (3 - $\overline{2 - 1}$)}]
RRB NTPC 21/03/2021 (Morning)
(a) 3 (b) 6 (c) 1 (d) 2

Q.619. 371 ÷ 16 = 23.1875. What will be the value of 0.00371 ÷ 0.016 ?
RRB NTPC 21/03/2021 (Morning)
(a) 0.0231875 (b) 231.875
(c) 2.31875 (d) 0.231875

Q.620. Find the value of
$\frac{(0.01)^2+(0.22)^2+(0.333)^2+(0.4444)^2+(0.55555)^2}{(0.001)^2+(0.022)^2+(0.0333)^2+(0.04444)^2+(0.055555)^2}$
RRB NTPC 21/03/2021 (Evening)
(a) 50 (b) 100 (c) 125 (d) 75

Q.621. What smallest positive fraction should be added to $3\frac{2}{3} + 6\frac{7}{12} + 4\frac{9}{36} + 5 + 7\frac{1}{12}$ to make the sum a whole number ?
RRB NTPC 21/03/2021 (Evening)
(a) $\frac{5}{12}$ (b) $\frac{11}{12}$ (c) $\frac{7}{12}$ (d) $\frac{13}{12}$

Q.622. If
x = $\sqrt{(1+\frac{\sqrt{3}}{2})} + \sqrt{(1-\frac{\sqrt{3}}{2})}$ then the simplified value of x will be:
RRB NTPC 27/03/2021 (Morning)
(a) $\sqrt{3}$ (b) $\frac{1}{2}$ (c) 1 (d) $-\sqrt{3}$

Q.623. Find the fraction form of 0.666....
RRB NTPC 27/03/2021 (Morning)
(a) $\frac{3}{2}$ (b) $\frac{2}{7}$ (c) $\frac{2}{3}$ (d) $\frac{1}{3}$

Q.624. Solve the following.
55 + [29 - {25 - (6 - 24 ÷ 6 × 8)}] = ?
RRB NTPC 27/03/2021 (Evening)
(a) 33 (b) 41 (c) 63 (d) 59

Q.625. Krishna ate $\frac{1}{3}$ *of* a pizza and Devshya ate $\frac{2}{5}$ of the remaining . What fraction of the pizza is left uneaten ?
RRB NTPC 27/03/2021 (Evening)
(a) $\frac{3}{15}$ (b) $\frac{4}{15}$ (c) $\frac{2}{5}$ (d) $\frac{3}{5}$

Q.626. If $\sqrt{40}$ = 6.3245, then what will be the value of $\sqrt{\frac{8}{5}}$?
RRB NTPC 27/03/2021 (Evening)
(a) 1.2649 (b) 1.2593
(c) 1.3303 (d) 1.4132

Q.627. Simplify: $4\sqrt{0.000081}$
RRB NTPC 01/04/2021 (Morning)
(a) 0.0081 (b) 0.36 (c) 0.0036 (d) 0.036

Q.628. By which number should $2\frac{1}{5}$ be multiplied to get $5\frac{2}{5}$?
RRB NTPC 01/04/2021 (Morning)
(a) $2\frac{5}{11}$ (b) $\frac{11}{27}$ (c) 3 (d) $3\frac{1}{5}$

Q.629. Simplify.
$\frac{1800 \div (24 \div 8 \times 3) + 16}{\frac{3}{4} \times (32 \div 2)}$
RRB NTPC 01/04/2021 (Morning)
(a) 18 (b) $\frac{454}{3}$ (c) $\frac{150}{17}$ (d) $\frac{39}{4}$

Q.630. Select the option that gives decimal numbers 0.25, 1.24, 0.0882 and 2.67 arranged in ascending order.
RRB NTPC 01/04/2021 (Morning)
(a) 0.0882, 0.25, 1.24, 2.67
(b) 0.25, 1.24, 0.0882, 2.67
(c) 2.67, 1.24, 0.25, 0.0882
(d) 1.24, 0.25, 2.67,0.0882

Q.631. If x = -102 - 3 [-2{21 + 16 ÷ (20 ÷ 5) - 3 × 2^2}] - 11, then what is the value of x ?
RRB NTPC 01/04/2021 (Evening)
(a) 17 (b) 35 (c) 24 (d) -35

Q.632. Find the value of $2 + \frac{1}{1+\frac{2}{1\frac{1}{4}}} + 1$
RRB NTPC 01/04/2021 (Evening)
(a) $\frac{44}{13}$ (b) $\frac{45}{13}$ (c) $\frac{42}{13}$ (d) $\frac{43}{13}$

Q.633. What is the ascending order of fractions $\frac{4}{7}$, $\frac{5}{6}$, $\frac{2}{3}$, and $\frac{7}{8}$?
RRB NTPC 01/04/2021 (Evening)
(a) $\frac{4}{7}, \frac{2}{3}, \frac{5}{6}, \frac{7}{8}$ (b) $\frac{4}{7}, \frac{5}{6}, \frac{2}{3}, \frac{7}{8}$
(c) $\frac{2}{3}, \frac{5}{6}, \frac{4}{7}, \frac{7}{8}$ (d) $\frac{2}{3}, \frac{5}{6}, \frac{7}{8}, \frac{4}{7}$

Q.634. Solve the following :-
1498 × 1498 =_____.
RRB NTPC 03/04/2021 (Morning)
(a) 22,56,004 (b) 22,44,004
(c) 22,44,000 (d) 2,25,600

Q.635. Which of the following fractions has terminating decimal expansion ?
RRB NTPC 03/04/2021 (Evening)
(a) $\frac{104}{111}$ (b) $\frac{19}{90}$ (c) $\frac{6}{15}$ (d) $\frac{11}{6}$

Q.636. The value of 24 + 13 - 5 × $\frac{1}{2}$ × 10 - {45 ÷ (17 − 2)} is:
(a) 9 (b) -7 (c) 18 (d) 11

Q.637. The number $0.\overline{13}$ in the form of $\frac{p}{q}$ is equal to :
RRB NTPC 06/04/2021 (Morning)
(a) $\frac{99}{13}$ (b) $\frac{39}{99}$ (c) $\frac{13}{99}$ (d) $\frac{31}{99}$

Q.638. The value of
$\sqrt{(10 + \sqrt{(200 + \sqrt{(596 + \sqrt{841})})})}$
is:
RRB NTPC 06/04/2021 (Morning)
(a) $5\sqrt{3}$ (b) $5\sqrt{2}$ (c) $5\sqrt{5}$ (d) $5\sqrt{1}$

Q.639. One third of one fourth of two seventh of 12 is:
RRB NTPC 06/04/2021 (Evening)
(a) $\frac{32}{7}$ (b) $\frac{2}{7}$ (c) $\frac{7}{2}$ (d) 14

Q.640. Solve the following.
$\frac{70 + 5 \times 2 \div 10 + 15 - 10}{25 \times 6 + 2}$ = ?
RRB NTPC 06/04/2021 (Evening)
(a) $\frac{19}{50}$ (b) $\frac{1}{2}$ (c) $\frac{53}{114}$ (d) $\frac{5}{18}$

Q.641. If $\frac{2}{5} + \frac{2}{10} = \frac{N+1}{N+5}$, then find the value of N.
RRB NTPC 07/04/2021 (Morning)
(a) 5 (b) $\frac{5}{9}$ (c) 9 (d) 4

Q.642. Find the value of N in the following equation $\frac{1}{3} + \frac{2}{9} = \frac{N+1}{N+5}$.
RRB NTPC 07/04/2021 (Morning)
(a) 1 (b) 3 (c) 4 (d) 0

Q.643. If $\frac{\sqrt{5}-1}{\sqrt{5}+1} - \frac{\sqrt{5}+1}{\sqrt{5}-1} = a + b\sqrt{5}$, then the value of (a + b) (a - b) ÷ $a^2 + b^2 is$:
RRB NTPC 07/04/2021 (Morning)
(a) -2 (b) 0 (c) -1 (d) 3

Q.644. Find the value of $\sqrt{54} \times \sqrt{6}$.
RRB NTPC 07/04/2021 (Morning)
(a) 45 (b) 25 (c) 18 (d) 65

Q.645. How many kilometers are there in 1 mm ?
RRB NTPC 07/04/2021 (Evening)
(a) Both $\frac{1}{100000}$ and 0.000001
(b) 0.0000001
(c) 0.000001
(d) $\frac{1}{100000}$

Q.646. Which of the following fractions does NOT lie between $\frac{7}{18}$ and $\frac{3}{5}$?
RRB NTPC 08/04/2021 (Morning)
(a) $\frac{2}{5}$ (b) $\frac{1}{2}$ (c) $\frac{5}{12}$ (d) $\frac{1}{3}$

Q.647. Which of the following is closest to zero ?
RRB NTPC 08/04/2021 (Morning)
(a) $1 - (0.09)^2$ (b) $(1 - 0.09)^2$
(c) 0.009 (d) $(0.09)^2$

Q.648. Find the value of
$$\frac{(0.01)^2+(0.22)^2+(0.333)^2+(0.4444)^2}{(0.001)^2+(0.022)^2+(0.0333)^2+(0.04444)^2}$$
RRB NTPC 08/04/2021 (Morning)
(a) 125 (b) 100 (c) 50 (d) 75

Q.649. Simplify $1.\overline{45} + 0.3\overline{12} - 1.11\overline{2}$.
RRB NTPC 08/04/2021 (Evening)
(a) $\frac{589}{900}$ (b) $\frac{13}{20}$ (c) $\frac{374}{495}$ (d) $\frac{163}{300}$

Q.650. What is the value of $3\frac{21}{23} \div 3\frac{15}{31}$?
RRB NTPC 08/04/2021 (Evening)
(a) $\frac{187}{138}$ (b) 3 (c) $\frac{155}{138}$ (d) 2

Q.651. What is the value of x in the following equation ?
$3^{2x+1} - 3^x = 3^{x+3} - 3^2$
RRB NTPC 08/04/2021 (Evening)
(a) 3, -1 (b) 4, -1 (c) 2, -1 (d) 4, -2

Q.652. How much does one have to subtract from $\frac{8}{5}$ to obtain $\frac{5}{8}$?
RRB NTPC 23/07/2021 (Morning)
(a) $\frac{39}{64}$ (b) $\frac{39}{40}$ (c) $\frac{31}{40}$ (d) $\frac{25}{64}$

Q.653. If 4x - 3y = 9 and x = 6, then what is the value of y ?
RRB NTPC 23/07/2021 (Morning)
(a) 6 (b) 4 (c) 5 (d) 3

Q.654. Express - $\frac{40}{56}$ as a rational number whose numerator is -5.
RRB NTPC 23/07/2021 (Evening)
(a) - $\frac{5}{6}$ (b) - $\frac{5}{7}$ (c) - $\frac{5}{8}$ (d) - $\frac{5}{18}$

Q.655. If $\frac{c}{d} = 1 \div \frac{3}{4}$, then $\frac{c+d}{c-d}$ = ?
RRB NTPC 23/07/2021 (Evening)
(a) $\frac{7}{4}$ (b) -7 (c) 7 (d) $\frac{4}{3}$

Q.656. The value of $\sqrt[5]{\frac{32}{243}}$ is _____.
RRB NTPC 23/07/2021 (Evening)
(a) $\frac{3}{2}$ (b) $\frac{2}{3}$ (c) $\frac{5}{2}$ (d) $\frac{5}{3}$

Q.657. If $\left(\frac{2}{3}\right)^{x+1} = \left(\frac{3}{2}\right)^{x-1}$ then x = ?
RRB NTPC 24/07/2021 (Morning)
(a) 2 (b) -1 (c) 0 (d) 3

Q.658. The cube root of 250 lies between:
RRB NTPC 24/07/2021 (Morning)
(a) 4 and 5 (b) 7 and 8
(c) 5 and 6 (d) 6 and 7

Q.659. The value of
$\sqrt{0.0121} + \sqrt[3]{0.008}$ is :
RRB NTPC 24/07/2021 (Morning)
(a) 0.11 (b) 0.31 (c) 0.21 (d) 0.2

Q.660. What is the value of
$\frac{(0.03)\times(0.05)\times(1.5)}{0.0225}$?
RRB NTPC 24/07/2021 (Morning)
(a) 0.15 (b) 0.1 (c) 0.05 (d) 1.5

Q.661. What is the sum of fractional numbers $1\frac{5}{7}$ and $1\frac{2}{5}$?
RRB NTPC 24/07/2021 (Morning)
(a) $3\frac{4}{35}$ (b) $3\frac{4}{25}$ (c) $3\frac{4}{49}$ (d) $3\frac{5}{35}$

Q.662. What is the value of
$(2+\sqrt{5})^4 - (2-\sqrt{5})^4$?
RRB NTPC 24/07/2021 (Morning)
(a) $144\sqrt{5}$ (b) $120\sqrt{5}$ (c) $96\sqrt{5}$ (d) $12\sqrt{5}$

Q.663. Solve the following.
$\frac{1}{2}\left[\frac{1}{3} - \left(\frac{1}{2} - \frac{1}{4}\right) + \frac{1}{2} - \frac{1}{4}\right]$ = ?
RRB NTPC 24/07/2021 (Evening)
(a) $\frac{1}{2}$ (b) 0 (c) $\frac{1}{4}$ (d) $\frac{1}{6}$

Q.664. What number should be added to $\frac{-5}{7}$ to get $\frac{-2}{3}$?
RRB NTPC 24/07/2021 (Evening)
(a) $\frac{10}{21}$ (b) $\frac{-7}{21}$ (c) $\frac{7}{21}$ (d) $\frac{1}{21}$

Q.665. The value of x in the equation x + $\frac{5}{27} = \frac{12}{27}$.
RRB NTPC 26/07/2021 (Morning)
(a) $\frac{7}{27}$ (b) $\frac{10}{27}$ (c) $\frac{9}{27}$ (d) $\frac{1}{3}$

Q.666. Find the value of $\sqrt{\frac{576}{625}}$
RRB NTPC 26/07/2021 (Evening)
(a) 0.9 (b) 0.99 (c) 0.96 (d) 10

Q.667. Solve the following:
$\frac{1}{2}\left[\frac{3}{4} - \left\{\frac{1}{4} - (-5-3)\right\}\right]$.
RRB NTPC 26/07/2021 (Evening)
(a) $3\frac{1}{4}$ (b) $-3\frac{1}{4}$ (c) $-3\frac{3}{4}$ (d) $3\frac{3}{4}$

Q.668. Find the value of
-5 {-5 - (-5 - 2) - 5}.
RRB NTPC 31/07/2021 (Morning)
(a) 18 (b) -18 (c) -15 (d) 15

Q.669. What should be added to $\left(\frac{1}{2} + \frac{1}{3} + \frac{1}{5}\right)$ to get 3 ?
RRB NTPC 31/07/2021 (Morning)
(a) $\frac{59}{10}$ (b) $\frac{54}{30}$ (c) $\frac{59}{30}$ (d) $\frac{3}{10}$

Q.670. What number should be added to $\frac{-5}{11}$ to obtain $\frac{26}{33}$?
RRB NTPC 31/07/2021 (Morning)
(a) $\frac{11}{33}$ (b) $\frac{21}{33}$ (c) $\frac{41}{33}$ (d) $\frac{33}{33}$

Q.671.
The value of $\frac{(54.542^2 - 45.458^2)}{(61.738 - 52.654)}$ is:
RRB NTPC 31/07/2021 (Evening)
(a) 100 (b) 35.084 (c) 32.458 (d) 67.542

Q.672. If $\sqrt{40}$ is almost equal to 6.325, then $\sqrt{\frac{8}{5}}$ is nearly equal to :
RRB NTPC 31/07/2021 (Evening)
(a) 1.625 (b) 2.825 (c) 0.565 (d) 1.265

Q.673. Solve the following.
$$\frac{3\frac{1}{4} - \frac{4}{5}\times\frac{5}{6}}{4\frac{1}{3} \div \frac{1}{5} - \left(\frac{3}{10} + 21\frac{1}{5}\right)}$$
$-\left(1\frac{2}{3} \times 1\frac{1}{2}\right)$ = ?
RRB NTPC 31/07/2021 (Evening)
(a) 9 (b) 13 (c) $11\frac{1}{2}$ (d) $15\frac{1}{2}$

RRB JE
(22/05/2019 to 28/06/2019)

Q.674. What is the difference between the largest and the smallest fractions among $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$ and $\frac{5}{6}$?
RRB JE 22/05/2019 (Afternoon)

(a) $\frac{3}{5}$ (b) $\frac{1}{7}$ (c) $\frac{1}{6}$ (d) $\frac{2}{5}$

Q.675. Find the smallest among these fractions.
$\frac{1}{2}, \frac{3}{5}, \frac{2}{7}, \frac{5}{6}$
RRB JE 22/05/2019 (Afternoon)
(a) $\frac{2}{7}$ (b) $\frac{3}{5}$ (c) $\frac{1}{2}$ (d) $\frac{5}{6}$

Q.676. What comes in the place of x ?
$1\frac{1}{4} + 1\frac{1}{6} - 1\frac{1}{8} = x + 1\frac{1}{12}$
RRB JE 22/05/2019 (Evening)
(a) $\frac{5}{12}$ (b) $\frac{7}{12}$ (c) $\frac{5}{24}$ (d) $\frac{7}{24}$

Q.677. Arrange the following fractions in descending order.
$\frac{5}{6}, \frac{3}{7}, \frac{8}{9}, \frac{3}{14}$
RRB JE 22/05/2019 (Evening)
(a) $\frac{8}{9}, \frac{5}{6}, \frac{3}{7}, \frac{3}{14}$ (b) $\frac{5}{6}, \frac{8}{9}, \frac{3}{7}, \frac{3}{14}$
(c) $\frac{3}{7}, \frac{8}{9}, \frac{5}{6}, \frac{3}{14}$ (d) $\frac{8}{9}, \frac{3}{14}, \frac{3}{7}, \frac{5}{6}$

Q.678. Simplify: $\sqrt{176 + \sqrt{2401}}$
RRB JE 22/05/2019 (Evening)
(a) 15 (b) 25 (c) 14 (d) 18

Q.679. If $\frac{3}{11} < \frac{x}{3} < \frac{7}{11}$ Which of the following values can 'x' take?
RRB JE 23/05/2019 (Morning)
(a) 2 (b) 0.5 (c) 3 (d) 1

Q.680. Simplify: $\frac{[18 \div 2 + (5 \times 3)]}{[5 \times 3 - 18 \div 2]}$
RRB JE 23/05/2019 (Evening)
(a) $\frac{5}{6}$ (b) $\frac{17}{12}$ (c) $\frac{14}{6}$ (d) 4

Q.681. If $\frac{x}{\sqrt{128}} = \frac{\sqrt{162}}{x}$, then find the value of 'x'.
RRB JE 23/05/2019 (Evening)
(a) 12 (b) 14 (c) 13 (d) 144

Q.682. Simplify:
$8 \div [(9 - 5) \div \{(7 - 2) \div (3 + 9 \div 24)\}]$
RRB JE 23/05/2019 (Evening)
(a) $\frac{80}{27}$ (b) $\frac{20}{27}$ (c) $\frac{60}{27}$ (d) $\frac{160}{27}$

Q.683. If $\frac{1}{7}$ of a number is subtracted from the number, the result is 30 less than the number. Find the number.
RRB JE 24/05/2019 (Evening)
(a) 210 (b) 140 (c) 120 (d) 105

Q.684. Simplify
$\sqrt{25 + 10\sqrt{6}} + \sqrt{25 - 10\sqrt{6}}$
RRB JE 24/05/2019 (Evening)
(a) $2\sqrt{15}$ (b) $2\sqrt{5}$ (c) $\sqrt{50}$ (d) $\sqrt{55}$

Q.685. Simplify:
$[1 + \frac{1}{10 + \frac{1}{10}}] + [1 - \frac{1}{10 + \frac{1}{10}}]$
RRB JE 28/05/2019 (Morning)
(a) 2 (b) $\frac{3}{10}$ (c) $\frac{91}{100}$ (d) $\frac{101}{10}$

Q.686. If 36^3 x $(4096)^{\frac{1}{2}}$ x 144 x 9 ÷ (9^3 × 72²) = 4^x, find the value of 'x'.
RRB JE 28/05/2019 (Afternoon)
(a) 5 (b) 7 (c) 8 (d) 12

Q.687. Simplify:
$\sqrt{(7 + 3\sqrt{5}) \times (7 - 3\sqrt{5})}$
RRB JE 31/05/2019 (Evening)
(a) 3 (b) 2 (c) 1 (d) 4

Q.688. Simplify:
$[2 \times (\frac{3}{2}) - 3 \times (\frac{2}{3})] \times [\frac{2}{5}$ of $\frac{3}{5}$ of 100]
RRB JE 31/05/2019 (Evening)
(a) 24 (b) 0 (c) 25 (d) 12

Q.689. Evaluate:
45 of $\frac{3}{5} \div 1\frac{2}{7} + 3$ of $\frac{1}{3} - 10$
RRB JE 01/06/2019 (Morning)
(a) 10 (b) 15 (c) 14 (d) 12

Q.690. Simplify: 0.032 x 0.2 + 0.32 x 0.002
RRB JE 01/06/2019 (Afternoon)
(a) 0.00704 (b) 0.0064
(c) 0.00064 (d) 0.0664

Q.691. Simplify: $\frac{2}{1 - \sqrt{2}}$
RRB JE 01/06/2019 (Evening)
(a) - (2 + √2) (b) 2 + √2
(c) - 2(1 + √2) (d) 1 - 2√2

Q.692. Find the greatest among these fractions.
$\frac{5}{6}, \frac{6}{11}, \frac{2}{3}, \frac{8}{9}, \frac{6}{7}$
RRB JE 01/06/2019 (Evening)
(a) $\frac{2}{3}$ (b) $\frac{5}{6}$ (c) $\frac{8}{9}$ (d) $\frac{6}{7}$

Q.693. Find the value of
$\frac{1}{\sqrt{2} + \sqrt{3} - \sqrt{5}} + \frac{1}{\sqrt{2} - \sqrt{3} - \sqrt{5}}$
RRB JE 02/06/2019 (Morning)
(a) 1 (b) $\sqrt{2}$ (c) $\frac{1}{\sqrt{2}}$ (d) $\frac{1}{2}$

Q.694. Simplify:
$\left(\frac{2}{3}\right) + \left(\frac{5}{6}\right) - \left(\frac{1}{9}\right) + \left(\frac{7}{9}\right)$
RRB JE 02/06/2019 (Morning)
(a) $\frac{43}{18}$ (b) $\frac{17}{9}$ (c) $\frac{13}{6}$ (d) $\frac{35}{18}$

Q.695. Simplify: $3.\overline{36} - 2.\overline{05} + 1.\overline{33}$
RRB JE 02/06/2019 (Morning)
(a) $2.\overline{61}$ (b) $2.6\overline{4}$ (c) $2.\overline{64}$ (d) 2.64

Q.696. Simplify:
$1035 \div [\frac{3}{4}(71 + 65) - 15\frac{3}{4}]$
RRB JE 02/06/2019 (Afternoon)
(a) 18 (b) 12 (c) 20 (d) 24

Q.697. Which of the following is the greatest?
RRB JE 02/06/2019 (Afternoon)
(a) $\frac{15}{16}$ (b) $\frac{24}{25}$ (c) $\frac{34}{35}$ (d) $\frac{19}{20}$

Q.698. If 0.034 = $\frac{x}{10}$, find the value of 'x'.
RRB JE 02/06/2019 (Afternoon)
(a) 340 (b) 34 (c) 0.34 (d) 3.4

Q.699. Find the smallest fraction.
RRB JE 02/06/2019 (Evening)
(a) $\frac{7}{8}$ (b) $\frac{15}{19}$ (c) $\frac{17}{21}$ (d) $\frac{13}{16}$

Q.700. Evaluate: $(\sqrt{3} - \frac{1}{\sqrt{3}})^2$
RRB JE 02/06/2019 (Evening)
(a) $\frac{3}{4}$ (b) $2\sqrt{3}$ (c) $\frac{4}{3}$ (d) $\frac{4}{\sqrt{3}}$

Q.701. If x = 16% of x + 42, then find the value of 'x'.
RRB JE 26/06/2019 (Morning)
(a) 58 (b) 50 (c) 52 (d) 60

Q.702. Find the decimal equivalent of $\frac{7}{8}$.
RRB JE 26/06/2019 (Morning)
(a) 0.875 (b) 0.675 (c) 0.825 (d) 0.625

Q.703. How many one-fifths are there in 200?
RRB JE 26/06/2019 (Morning)
(a) 200 (b) 800 (c) 500 (d) 1000

Q.704. Find the value of
$(100)^{\frac{1}{2}} \times (0.001)^{\frac{1}{3}} - (0.0016)^{\frac{1}{4}}$
RRB JE 26/06/2019 (Evening)
(a) $\frac{1}{5}$ (b) $\frac{2}{5}$ (c) $\frac{3}{80}$ (d) $\frac{4}{5}$

Q.705. If $\frac{x + a}{x + b} = \frac{x + 3a}{x + a + b}$, find the value of 'x'.
RRB JE 26/06/2019 (Evening)
(a) a + 2b (b) a + b (c) a - 2b (d) a - b

Q.706. Simplify: $\frac{3}{4}[1\frac{1}{6} - (1\frac{1}{2} - \frac{1}{3})]$
RRB JE 26/06/2019 (Evening)

(a) $\frac{7}{12}$ (b) 0 (c) $\frac{5}{12}$ (d) $\frac{3}{14}$

Q.707. Among the four fractions given below, which one is greater than $\frac{7}{12}$ but lesser than $\frac{11}{16}$?
RRB JE 27/06/2019 (Morning)
(a) $\frac{1}{2}$ (b) $\frac{5}{8}$ (c) $\frac{7}{8}$ (d) $\frac{3}{8}$

Q.708. If a * b = (a + b) + ab, then find the value of 3*5 - 2*3.
RRB JE 27/06/2019 (Morning)
(a) 24 (b) 13 (c) 10 (d) 12

Q.709. Find the value of
$(1 - \frac{1}{2})(1 - \frac{1}{3})(1 - \frac{1}{4})....(1 - \frac{1}{50})$.
RRB JE 27/06/2019 (Morning)
(a) $\frac{1}{50}$ (b) $\frac{1}{49}$ (c) $\frac{1}{25}$ (d) $\frac{2}{49}$

Q.710. Simplify :-
$(\frac{1}{4} - \frac{1}{5} + \frac{3}{4} - \frac{4}{5}) \div (\frac{2}{5} - \frac{5}{9} + \frac{3}{5} - \frac{11}{18})$
RRB JE 27/06/2019 (Evening)
(a) 0 (b) $3\frac{1}{4}$ (c) $\frac{5}{18}$ (d) $5\frac{1}{18}$

Q.711. Find the smallest fraction.
RRB JE 27/06/2019 (Evening)
(a) $\frac{3}{4}$ (b) $\frac{11}{13}$ (c) $\frac{5}{7}$ (d) $\frac{9}{11}$

Q.712. Find the value of
$\frac{(82+28)^2-(82-28)^2}{82\times 28}$
RRB JE 28/06/2019 (Evening)
(a) 220 (b) 8 (c) 4 (d) 110

RRB ALP Tier - 2
(21/01/2019 to 08/02/2019)

Q.713. If $\frac{5x}{2} - \frac{5}{3}(\frac{3}{2} + \frac{4x}{3}) = \frac{5}{6}$, then the value of x is:
ALP Tier II 21/01/2019 (Afternoon)
(a) 3 (b) 12 (c) 6 (d) 4

Q.714.
$\sqrt{0.015625} \times \sqrt{0.0256}$ =_____.
ALP Tier II 21/01/2019 (Afternoon)
(a) 0.04 (b) 0.004 (c) 0.02 (d) 0.002

Q.715. $12 - 20\%\ of\ (42 \times 5 \div 15 - 18 \times 10 \div 15 + 8)$ =_____
ALP Tier II 21/01/2019 (Afternoon)
(a) 6 (b)10 (c) 8 (d)12

Q.716. What is the square root of 0.000225
ALP Tier II 21/01/2019 (Evening)
(a) 0.015 (b) 0.005 (c) 0.0015 (d) 0.0125

Q.717. The sum of a number and 16 times its reciprocal is 10. So the number is:
ALP Tier II 21/01/2019 (Evening)
(a) 7 (b) 5 (c) 8 (d) 6

Q.718. If $(x-1)^2 + (y-2)^2 = (x-1)(y-2)$ where x and y are integers, then the value of 2x + 3y is :
ALP Tier II 21/01/2019 (Morning)
(a) 7 (b) 11 (c) 8 (d) 5

Q.719. If √X + 0.24 = 0.1296 , find the value of X
ALP Tier II 23/01/2019 (Morning)
(a) 0.0144 (b) 0.12 (c) 0.0012 (d) 1.44

Q.720. 20 – 2 [25% of (15 × 8 ÷ 6 +12)] = _____ ?
ALP Tier II 23/01/2019 (Morning)
(a) 8 (b) 6 (c) 10 (d) 4

Q.721.
$(0.1^2 - 0.0252^2) \div (0.1 - 0.025)$ = _____ .
ALP Tier II 23/01/2019 (Morning)
(a) 0.25 (b) 0.625 (c) 0.325 (d) 0.125

Q.722. If $\frac{5x}{2} - \frac{1}{4}(6x - \frac{5}{3}) = \frac{7}{6}$ then the value of x is _____.
ALP Tier II 23/01/2019 (Morning)
(a) $\frac{5}{7}$ (b) $\frac{5}{4}$ (c) $\frac{3}{7}$ (d) $\frac{3}{4}$

Q.723. Solve the following.
$\sqrt{0.2025} + \sqrt{0.12225}$ = _____
ALP Tier II 23/01/2019 (Afternoon)
(a) 0.9 (b) 0.6 (c) 0.8 (d) 1.2

Q.724. If $\frac{5x}{3} - \frac{7}{2}(\frac{2x}{5} - \frac{1}{3}) = \frac{1}{3}$, then the value of x is_____
ALP Tier II 23/01/2019 (Afternoon)
(a) 1.25/8 (b) -5/14 (c) -25/8 (d) 5/14

Q.725. Find the value of the given expression: 16 - (25% of (14 x 10 ÷ 35 + 12 x 10 ÷ 15))
ALP Tier II 23/01/2019 (Afternoon)
(a) 9 (b) 13 (c) 7 (d) 11

Q.726. The value of (0.12 x 0.12 x 0.12) x (1.32 x 1.32 x 1.32)/(0.52 x 0.52) :
ALP Tier II 08/02/2019 (Morning)
(a) 0.187 (b) 0.0187
(c) 0.0147 (d) 0.147

Q.727. The value of −7 (2x + 4y) −2 (x − 2y) is:
ALP Tier II 08/02/2019 (Morning)
(a) -4(2x + 3y) (b) -8(2x + 3y)
(c) -8(2x - 3y) (d) -3(2x + 3y)

Q.728. find the unknown (?) number:
$\frac{0.088}{(?)} = 0.02$
ALP Tier II 08/02/2019 (Morning)
(a) 4.2 (b) 3.4 (c) 4.4 (d) 3.2

Q.729. The square root of (10 + √25) (12 – √49) is:
ALP Tier II 08/02/2019 (Morning)
(a) 4√3 (b) 5√3 (c) 3√3 (d) 2√3

Q.730. If x = 15, y = 20 and z = 10 then the value of (5x – 15) / (y + Z) is equal to _____:
ALP Tier II 08/02/2019 (Morning)
(a) 2 (b) 3 (c) 4 (d) 6

RPF Constable
(17/01/2019 to 19/02/2019)

Q.731. Solve the Equation :
$\frac{23\times 552 \div 24 + 23}{552 \div 23 - 1}$ = ?
RPF Constable 17/01/2019 (Morning)
(a) 25 (b) 23 (c) 26 (d) 24

Q.732. Find the fractional value of x, where x = 0.344444 ...
RPF Constable 17/01/2019 (Evening)
(a) 31/990 (b) 35/99
(c) 31/90 (d) 13/99

Q.733. Find the value of x:
$\sqrt{(189 - X)} = \sqrt{(178 - \sqrt{81})}$
RPF Constable 17/01/2019 (Evening)
(a) 20 (b) 27 (c) 38 (d) 49

Q.734. Simplify the following.
128 - [56 ÷ (46 ÷ 23 - [9 - 81 ÷ 9})]
RPF Constable 17/01/2019 (Evening)
(a) 130 (b) 100 (c) 140 (d) 120

Q.735. Simplify the following.
$[2^4 \div 8]^4 + \sqrt{(135 - \sqrt{196})}$
RPF Constable 17/01/2019 (Evening)
(a) 42 (b) 37 (c) 27 (d) 13

Q.736. Find the value of x :
$(x^3) \div 11 = 968$
RPF Constable 18/01/2019 (Morning)
(a) 24 (b) 20 (c) 26 (d) 22

Q.737. Simplify: $\frac{11\times 132 \div 12 + 11}{108 \div 9 - 1}$
RPF Constable 18/01/2019 (Morning)
(a) 14 (b) 13 (c) 12 (d) 11

Q.738. Simplify the expression:-
$\frac{37}{20} + \frac{3}{10} - \frac{5}{4}$ = ?
RPF Constable 18/01/2019 (Afternoon)
(a) 0.90 (b) 0.91 (c) 0.89 (d) 0.92

Q.739. Solve it and Find the value of x :-
$(x^3) \div 29 = 841$
RPF Constable 18/01/2019 (Afternoon)
(a) 29 (b) 31 (c) 30 (d) 28

Q.740. x = 0.5808080, find the fractional value of x.
RPF Constable 18/01/2019 (Afternoon)
(a) 572/990 (b) 574/990
(c) 573/990 (d) 575/990

Q.741. Which of the following is the perfect square ?
RPF Constable 18/01/2019 (Evening)
(a) 5778 (b) 5777 (c) 5776 (d) 5772

Q.742. Find the Value of x :
$(x^3) \div 14 = 1568$
RPF Constable 19/01/2019 (Morning)
(a) 28 (b) 30 (c) 32 (d) 26

Q.743. Solve: $\frac{1}{8} + \frac{3}{4} - \frac{5}{8} = ?$
RPF Constable 19/01/2019 (Morning)
(a) 0.3 (b) 0.45 (c) 0.5 (d) 0.25

Q.744. Solve:
$79 - [23 - \{84 \div 7 - (16 - 16 \div 4) \div 4\}]$
RPF Constable 19/01/2019 (Morning)
(a) 61 (b) 63 (c) 67 (d) 65

RPF S.I. (19/12/2018 to 16/01/2019)

Q.745. Simplify: $((4^4)^2 \times \frac{1}{64^2})^2 + 10 = ?$
RPF S.I. 19/12/2018 (Morning)
(a) 344 (b) 244 (c) 366 (d) 266

Q.746. Simplify: $\sqrt{16.81} + \sqrt{67.24} \div 2 = ?$
RPF S.I. 19/12/2018 (Evening)
(a) 8.4 (b) 8 (c) 8.2 (d) 8.1

Q.747. Simplify: $5 \div 5^{-2} + \sqrt{25} - \sqrt{121} = ?$
RPF S.I. 19/12/2018 (Evening)
(a) 143 (b) 132 (c) 121 (d) 119

Q.748. Simplify:
$\frac{1}{10} \div \frac{1}{10} \div \frac{1}{10} \div \frac{1}{10} \div \frac{1}{10}$
RPF S.I. 19/12/2018 (Evening)
(a) 800 (b) 1000 (c) 1200 (d) 900

Q.749. Simplify:
$((6^4)^2 \times \frac{1}{216^2}) \times 6 + 16 = ?$
RPF S.I. 24/12/2018 (Morning)
(a) 224 (b) 242 (c) 216 (d) 232

Q.750. Simplify:
$6 \div 6^{-2} + \sqrt{36} - \sqrt{144} = ?$
RPF S.I. 24/12/2018 (Morning)
(a) 240 (b) 230 (c) 220 (d) 210

Q.751. Find the value of x.
$\frac{2}{5}(x) + \frac{3}{10}(x) - \frac{3}{5}(x) = 531$
RPF S.I. 05/01/2019 (Morning)
(a) 5210 (b) 5410 (c) 5310 (d) 5510

Q.752. Find the value of x .
$\sqrt{441} \div 21 + \sqrt{484} = 1 \times x$
RPF S.I. 05/01/2019 (Morning)
(a) 26 (b) 25 (c) 23 (d) 24

Q.753. Solve:
$\frac{1}{13} \div \frac{1}{13} \div \frac{1}{13} \div \frac{1}{13} \div \frac{1}{13} = ?$
RPF S.I. 06/01/2019 (Morning)
(a) 2197 (b) 1444 (c) 1331 (d) 2917

Q.754. Solve: $(8^4)^2 \times \frac{1}{512^2} \times 8 + 18 = ?$
RPF S.I. 06/01/2019 (Morning)
(a) 490 (b) 530 (c) 510 (d) 550

Q.755. Solve: $\sqrt{21.16} + \sqrt{79.21} + 8.9 = ?$
RPF S.I. 06/01/2019 (Morning)
(a) 22.6 (b) 22.4 (c) 22.2 (d) 22.8

Q.756. What will come in place of question mark (?) in the given equation?
$12.34 + 23.45 + 34.56 - 45.67 = 2 \times ?$
RPF S.I. 06/01/2019 (Afternoon)
(a) 13.34 (b) 14.34 (c) 12.34 (d) 11.34

Q.757. Solve the equation.
$169^2 \times 52 \div 13^2 \times 1020 = ?$
RPF S.I. 06/01/2019 (Afternoon)
(a) 4050 (b) 4060 (c) 4070 (d) 4080

Q.758. Find the value of x.
$\sqrt{169} \div 13 + \sqrt{196} = 3 \times x$
RPF S.I. 10/01/2019 (Morning)
(a) 2 (b) 3 (c) 4 (d) 5

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.759. Which of the numbers given below is the square root of 15376 ?
RRB ALP 09/08/2018 (Morning)
(a) 124 (b) 134 (c) 122 (d) 128

Q.760. Which of the following is a reducible fraction?
RRB ALP 09/08/2018 (Afternoon)
(a) $\frac{105}{112}$ (b) $\frac{91}{15}$ (c) $\frac{41}{17}$ (d) $\frac{79}{26}$

Q.761. Solve the following:
$-\frac{1}{4}\{-45 - (-96) \div (-32)\} = ?$
RRB ALP 09/08/2018 (Afternoon)
(a) -10.5 (b) 10.5 (c) -12 (d) 12

Q.762. Which of the fractions given below, when added to $\frac{5}{8}$ gives 1 ?
RRB ALP 09/08/2018 (Afternoon)
(a) $\frac{5}{2}$ (b) $\frac{6}{16}$ (c) $\frac{6}{3}$ (d) $\frac{6}{24}$

Q.763. Solve the following:
$22 - (\frac{1}{4})\{-5 - (-48) \div (-16)\}$
RRB ALP 09/08/2018 (Evening)
(a) 24 (b) 22 (c) 21 (d) 0

Q.764. The fraction from the ones listed below that will not lead to a recurring decimal is:
RRB ALP 09/08/2018 (Evening)
(a) $\frac{4}{56}$ (b) $\frac{7}{56}$ (c) $\frac{6}{56}$ (d) $\frac{8}{56}$

Q.765. The square root of 3249 is:
RRB ALP 09/08/2018 (Evening)
(a) 63 (b) 57 (c) 59 (d) 67

Q.766. Solve the following:
$(-4)\{19 - (-2) \times (-8)\} = ?$
RRB ALP 10/08/2018 (Morning)
(a) 140 (b) -140 (c) -12 (d) 12

Q.767. Which of the following numbers is a perfect square ?
RRB ALP 10/08/2018 (Morning)
(a) 333 (b) 327 (c) 192 (d) 441

Q.768. The product of two decimals is 0.768. If one of the decimal numbers is 1.6, find the other.
RRB ALP 10/08/2018 (Morning)
(a) 0.47 (b) 0.48 (c) 0.37 (d) 0.42

Q.769. The product of two numbers is 0.432. One of the numbers is 1.6. What is the other number?
RRB ALP 10/08/2018 (Morning)
(a) 2.7 (b) 0.27 (c) 27 (d) 0.027

Q.770. Find the fraction which is as much greater than $\frac{4}{7}$ as it is less than $\frac{5}{6}$
RRB ALP 10/08/2018 (Morning)
(a) $\frac{59}{85}$ (b) $\frac{58}{84}$ (c) $\frac{59}{84}$ (d) $\frac{84}{59}$

Q.771. If A = (- 14 + 4) and B = 4 - 14 , then AB =
RRB ALP 10/08/2018 (Afternoon)
(a) 0 (b) 100 (c) -1 (d) -100

Q.772. To get number 40 the number 6 $\frac{2}{9}$ should be multiplied with
RRB ALP 10/08/2018 (Afternoon)
(a) $3\frac{5}{7}$ (b) $6\frac{3}{7}$ (c) $7\frac{3}{7}$ (d) $7\frac{3}{6}$

Q.773. How many kilometers are there in one meter?
RRB ALP 10/08/2018 (Evening)
(a) 0.1 (b) 0.001 (c) 0.01 (d) 0.0001

Q.774. Given 17 x 29 = 493, then 170 x 0.029 = ?
RRB ALP 10/08/2018 (Evening)
(a) 4.93 (b) 0.493 (c) 49.3 (d) 0.0493

Q.775. The square root of 27225 is:
RRB ALP 10/08/2018 (Evening)
(a) 145 (b) 165 (c) 175 (d) 155

Q.776. Which of the following will give a terminating decimal ?
RRB ALP 10/08/2018 (Evening)
(a) $\frac{3}{36}$ (b) $\frac{6}{36}$ (c) $\frac{12}{36}$ (d) $\frac{9}{36}$

Q.777. Solve the following.
{38 - (60 ÷ 5 x $\overline{16 - 8}$ ÷ 2 ÷ 3)} = ?
RRB ALP 10/08/2018 (Evening)
(a) 30 (b) 29 (c) 37 (d) 22

Q.778. The square root of 5329 is .
RRB ALP 13/08/2018 (Morning)
(a) 94 (b) 96 (c) 97 (d) 73

Q.779. The product of two numbers is 0.324. One of the numbers is 1.2. What is the other number?
RRB ALP 13/08/2018 (Afternoon)
(a) 27 (b) 2.7 (c) 0.027 (d) 0.27

Q.780. Reciprocal of $2\frac{3}{5}$
RRB ALP 13/08/2018 (Afternoon)
(a) $3\frac{3}{5}$ (b) $5\frac{3}{2}$ (c) $\frac{5}{13}$ (d) $2\frac{3}{5}$

Q.781. The product of two numbers is 40. One of them is 2.50. What is the other number ?
RRB ALP 13/08/2018 (Evening)
(a) 14 (b) 12 (c) 15 (d) 16

Q.782. Solve the following.
45 - [38 - { 60 ÷ 3 - (6 - 9 ÷ 3) ÷ 3 }] = ?
RRB ALP 13/08/2018 (Evening)
(a) 26 (b) 21 (c) 25 (d) 24

Q.783. 23 × 31 = 713 How much is 0.0713 ÷ 3.1 ?
RRB ALP 13/08/2018 (Evening)
(a) 0.0023 (b) 0.23 (c) 2.3 (d) 0.023

Q.784. If $\frac{3}{4}$ of the weight of a brick is $\frac{7}{8}$kg, then $\frac{5}{7}$ of the weight of the brick will be:
RRB ALP 14/08/2018 (Morning)
(a) $\frac{5}{6}$kg (b) $\frac{5}{8}$kg (c) $\frac{15}{32}$kg (d) $\frac{20}{21}$kg

Q.785. A fraction, when taken away from $\frac{1}{3}$, gives $\frac{1}{12}$. The fraction is :
RRB ALP 14/08/2018 (Morning)
(a) $\frac{3}{4}$ (b) $\frac{1}{9}$ (c) $\frac{5}{12}$ (d) $\frac{1}{4}$

Q.786. The square of 11111 is:
RRB ALP 14/08/2018 (Afternoon)
(a) 123454321 (b) 321231
(c) 1223311 (d) 1234321

Q.787. 23 - [24 - {25 - (26 -$\overline{27 - 28}$)}] = ?
RRB ALP 14/08/2018 (Evening)
(a) 1 (b) - 3 (c) -1 (d) -2

Q.788. 25 – $\frac{1}{2}${5 + 4 – (3 + 2 – 1 + 3)} =?
RRB ALP 14/08/2018 (Evening)
(a) 22 (b) 21 (c) 23 (d) 24

Q.789. $\frac{4}{5} + \frac{4}{7}$ =?
RRB ALP 14/08/2018 (Evening)
(a) $\frac{16}{35}$ (b) $1\frac{13}{35}$ (c) $\frac{8}{35}$ (d) $\frac{8}{12}$

Q.790. How much does one need to add to $\frac{2}{3}$ to obtain $\frac{3}{2}$?
RRB ALP 17/08/2018 (Morning)
(a) $\frac{4}{9}$ (b) $\frac{1.5}{6}$ (c) $\frac{1}{-1}$ (d) $\frac{5}{6}$

Q.791. The least number to be added to 435 to make it a perfect square is?
RRB ALP 17/08/2018 (Morning)
(a) 8 (b) 4 (c) 3 (d) 6

Q.792. What is the square root of 576?
RRB ALP 17/08/2018 (Morning)
(a) 26 (b) 36 (c) 34 (d) 24

Q.793. Square root of 0.9 is equal to
RRB ALP 17/08/2018 (Afternoon)
(a) 0.9487 (b) 0.3 (c) 0.9463 (d) 0.03

Q.794. Solve the following:
24 - [25 - {26 - (27 - $\overline{28 - 29}$)}] = ?
RRB ALP 17/08/2018 (Evening)
(a) - 2 (b) - 3 (c) 1 (d) - 1

Q.795. 1.004 - 0.4 is equal to:
RRB ALP 17/08/2018 (Evening)
(a) 0.006 (b) 1 (c) 0.640 (d) 0.604

Q.796. If $\frac{60}{75}$ is equivalent to $\frac{4}{x}$, then the value of x is:
RRB ALP 17/08/2018 (Evening)
(a) 18 (b) 4 (c) 15 (d) 5

Q.797. The product of two numbers is 20. One of them is 1.25. What is the other number?
RRB ALP 17/08/2018 (Evening)
(a) 15 (b) 12 (c) 16 (d) 14

Q.798. 46% of 250 is equal to:
RRB ALP 17/08/2018 (Evening)
(a)103.5 (b) 112 (c) 92 (d) 115

Q.799. $0.02\overline{45}$ written as a vulgar fraction in its simplest form = ?
RRB ALP 20/08/2018 (Afternoon)
(a) $\frac{9}{37}$ (b) $\frac{27}{1100}$ (c) $\frac{9}{370}$ (d) $\frac{27}{1111}$

Q.800. Solve the following:
23 - [23 - {23 - (23 - 23 + 23)}]
RRB ALP 20/08/2018 (Evening)
(a) -1 (b) 1 (c) 23 (d) 0

Q.801. If 23 x 19 = 437. How much is 0.0437 ÷ 1.9 = ?
RRB ALP 21/08/2018 (Morning)
(a) 0.023 (b) 0.23 (c) 2.3 (d) 0.0023

Q.802. 25 divided by $\frac{1}{5}$
RRB ALP 21/08/2018 (Evening)
(a) $\frac{1}{125}$ (b) 5 (c) 125 (d) 25

Q.803. 4 + $(\frac{1}{6})$[{- 10 × (25 - 13 - 3)} ÷ (-5)] = ?
RRB ALP 21/08/2018 (Evening)
(a) 6 (b) 7 (c) 9 (d) 8

Q.804. [63 - (- 3) {- 2 - 8 - 3}] ÷ 3 {6 + (-2) (-1)} =?
RRB ALP 29/08/2018 (Morning)
(a) 3 (b) 2 (c) 0 (d) 1

Q.805.Select the option that can replace the question mark (?) in the following equation.
2 + 5 ÷ [5 + 8 ÷ (1 + $\frac{1}{3}$) − 1] = ?
RRB ALP 29/08/2018 (Afternoon)
(a) $\frac{3}{2}$ (b) $\frac{5}{2}$ (c) 2 (d) $\frac{1}{2}$

Q.806. 56% of 375 is :
RRB ALP 29/08/2018 (Afternoon)
(a) 168 (b) 196 (c) 224 (d) 210

Q.807. 58% of 350 is:
RRB ALP 29/08/2018 (Afternoon)
(a) 210 (b) 203 (c) 196 (d) 217

Q.808. 8 × { 5 - (- 2) × (- 3)} = ?
RRB ALP 30/08/2018 (Morning)
(a) 8 (b) 88 (c) -168 (d) - 8

Q.809.The value of.
122 + 345 - 3 ÷ 1116 × 372 is:
RRB ALP 30/08/2018 (Morning)
(a) 446 (b) 460 (c) 469 (d) 466

Q.810. A fraction when added to $\frac{7}{3}$ gives 4. What is the fraction ?
RRB ALP 30/08/2018 (Afternoon)
(a) $\frac{13}{2}$ (b) $\frac{2}{3}$ (c) - $\frac{1}{1}$ (d) $1\frac{2}{3}$

Q.811. Which of the fractions given below, when added to $\frac{5}{7}$ gives 1 ?
RRB ALP 30/08/2018 (Afternoon)

(a) $\frac{5}{3}$ (b) $\frac{6}{14}$ (c) $\frac{6}{21}$ (d) $\frac{4}{2}$

Q.812. 18% of 60 is 54% of _____ .
RRB ALP 30/08/2018 (Afternoon)
(a) 20 (b) 40 (c) 30 (d) 180

Q.813. Which of the numbers given below is the square root of 16384 ?
RRB ALP 30/08/2018 (Evening)
(a) 128 (b) 122 (c) 132 (d) 118

Q.814. Which of the below given fractions is not equal to $\frac{9}{17}$?
RRB ALP 31/08/2018 (Morning)
(a) $\frac{108}{221}$ (b) $\frac{27}{51}$ (c) $\frac{63}{119}$ (d) $\frac{153}{289}$

Q.815. Select the option that can replace the question mark (?) in the following equation.
$\frac{(0.2)^3-(0.1)^3}{(0.2+0.1)^2}$ = ?
RRB ALP 31/08/2018 (Morning)
(a) $\frac{3}{40}$ (b) $\frac{7}{90}$ (c) $\frac{-7}{90}$ (d) $\frac{1}{18}$

Q.816. Select the option that can replace the question mark (?) in the following equation.
$\frac{(0.3)^3+(0.2)^3}{(0.3-0.2)^2}$ = ?
RRB ALP 31/08/2018 (Afternoon)
(a) 2 (b) $\frac{7}{2}$ (c) $\frac{3}{2}$ (d) $\frac{5}{2}$

Q.817. What is the value of |3(1) - 6|?
RRB ALP 31/08/2018 (Evening)
(a) 4 (b) 0 (c) −3 (d) 3

Q.818. Evaluate :
$\sqrt{93+\sqrt{32+\sqrt{274+\sqrt{225}}}}$
RRB ALP 31/08/2018 (Evening)
(a) 9 (b) 12 (c) 11 (d) 10

Q.819. (5x - 3) (x + 4) - (2x + 5)(3x - 4) = ?
RRB ALP 31/08/2018 (Evening)
(a) x^2 + 10x + 8 (b) - x^2 + 10x - 8
(c) x^2 + 10x - 8 (d) - x^2 + 10x + 8

Answer Key : -

1.(a)	2.(a)	3.(a)	4.(a)
5.(b)	6.(c)	7.(a)	8.(d)
9.(d)	10.(b)	11.(a)	12.(d)
13.(d)	14.(c)	15.(b)	16.(c)
17.(d)	18.(a)	19.(d)	20.(d)
21.(b)	22.(c)	23.(d)	24.(a)
25.(a)	26.(b)	27.(c)	28.(c)
29.(c)	30.(c)	31.(d)	32.(a)
33.(c)	34.(c)	35.(d)	36.(b)
37.(b)	38.(d)	39.(b)	40.(c)
41.(b)	42.(d)	43.(a)	44.(b)
45.(d)	46.(c)	47.(c)	48.(a)
49.(c)	50.(c)	51.(d)	52.(d)
53.(c)	54.(a)	55.(c)	56.(d)
57.(b)	58.(d)	59.(a)	60.(d)
61.(a)	62.(d)	63.(b)	64.(c)
65.(a)	66.(d)	67.(d)	68.(d)
69.(a)	70.(b)	71.(c)	72.(c)
73.(c)	74.(d)	75.(b)	76.(c)
77.(b)	78.(c)	79.(c)	80.(a)
81.(b)	82.(b)	83.(a)	84.(a)
85.(c)	86.(d)	87.(b)	88.(d)
89.(c)	90.(a)	91.(a)	92.(b)
93.(d)	94.(c)	95.(d)	96.(c)
97.(a)	98.(a)	99.(a)	100.(c)
101.(d)	102.(c)	103.(a)	104.(c)
105.(c)	106.(d)	107.(d)	108.(d)
109.(a)	110.(d)	111.(c)	112.(b)
113.(a)	114.(b)	115.(c)	116.(d)
117.(c)	118.(d)	119.(c)	120.(b)
121.(c)	122.(a)	123.(a)	124.(b)
125.(b)	126.(b)	127.(d)	128.(c)
129.(a)	130.(c)	131.(a)	132.(d)
133.(a)	134.(b)	135.(a)	136.(c)
137.(c)	138.(c)	139.(b)	140.(b)
141.(d)	142.(c)	143.(c)	144.(c)
145.(d)	146.(c)	147.(d)	148.(b)
149.(b)	150.(c)	151.(c)	152.(a)
153.(d)	154.(a)	155.(d)	156.(a)
157.(c)	158.(b)	159.(a)	160.(a)
161.(d)	162.(d)	163.(c)	164.(d)
165.(b)	166.(c)	167.(d)	168.(b)
169.(c)	170.(a)	171.(b)	172.(b)
173.(d)	174.(c)	175.(d)	176.(d)
177.(d)	178.(a)	179.(c)	180.(b)
181.(b)	182.(c)	183.(a)	184.(b)
185.(c)	186.(a)	187.(a)	188.(a)
189.(a)	190.(c)	191.(c)	192.(b)
193.(d)	194.(d)	195.(a)	196.(d)
197.(b)	198.(d)	199.(b)	200.(c)
201.(c)	202.(c)	203.(d)	204.(a)
205.(d)	206.(b)	207.(c)	208.(d)
209.(c)	210.(c)	211.(a)	212.(a)
213.(a)	214.(c)	215.(d)	216.(d)
217.(d)	218.(b)	219.(d)	220.(d)
221.(c)	222.(c)	223.(b)	224.(c)
225.(d)	226.(a)	227.(b)	228.(b)
229.(b)	230.(d)	231.(d)	232.(b)
233.(b)	234.(d)	235.(b)	236.(d)
237.(a)	238.(b)	239.(c)	240.(b)
241.(a)	242.(b)	243.(b)	244.(d)
245.(c)	246.(a)	247.(a)	248.(c)
249.(c)	250.(b)	251.(a)	252.(c)
253.(c)	254.(c)	255.(d)	256.(b)
257.(c)	258.(b)	259.(a)	260.(c)
261.(b)	262.(d)	263.(d)	264.(d)
265.(d)	266.(c)	267.(d)	268.(d)
269.(a)	270.(d)	271.(c)	272.(a)
273.(d)	274.(b)	275.(c)	276.(b)
277.(b)	278.(c)	279.(a)	280.(a)
281.(a)	282.(d)	283.(b)	284.(b)
285.(c)	286.(c)	287.(a)	288.(a)
289.(d)	290.(d)	291.(a)	292.(b)
293.(d)	294.(d)	295.(a)	296.(d)
297.(b)	298.(a)	299.(b)	300.(d)
301.(c)	302.(a)	303.(b)	304.(d)
305.(c)	306.(d)	307.(b)	308.(b)
309.(b)	310.(d)	311.(b)	312.(b)
313.(c)	314.(c)	315.(c)	316.(a)
317.(c)	318.(c)	319.(c)	320.(a)
321.(c)	322.(d)	323.(d)	324.(d)
325.(d)	326.(c)	327.(b)	328.(b)
329.(b)	330.(b)	331.(a)	332.(d)
333.(d)	334.(b)	335.(d)	336.(b)
337.(d)	338.(b)	339.(b)	340.(b)
341.(a)	342.(c)	343.(b)	344.(a)
345.(b)	346.(b)	347.(b)	348.(b)
349.(c)	350.(a)	351.(d)	352.(a)
353.(d)	354.(d)	355.(d)	356.(b)
357.(d)	358.(b)	359.(d)	360.(c)
361.(a)	362.(b)	363.(c)	364.(b)
365.(a)	366.(c)	367.(c)	368.(d)
369.(d)	370.(d)	371.(a)	372.(d)
373.(b)	374.(c)	375.(c)	376.(d)
377.(b)	378.(c)	379.(c)	380.(c)
381.(a)	382.(b)	383.(d)	384.(a)
385.(a)	386.(b)	387.(a)	388.(d)
389.(d)	390.(c)	391.(b)	392.(c)
393.(c)	394.(a)	395.(a)	396.(a)
397.(b)	398.(d)	399.(b)	400.(a)

401.(b)	402.(c)	403.(c)	404.(d)
405.(c)	406.(a)	407.(a)	408.(d)
409.(a)	410.(b)	411.(b)	412.(c)
413.(b)	414.(d)	415.(a)	416.(a)
417.(b)	418.(b)	419.(d)	420.(c)
421.(c)	422.(a)	423.(a)	424.(b)
425.(b)	426.(c)	427.(d)	428.(d)
429.(d)	430.(b)	431.(c)	432.(c)
433.(d)	434.(a)	435.(b)	436.(a)
437.(b)	438.(d)	439.(a)	440.(c)
441.(a)	442.(a)	443.(b)	444.(a)
445.(a)	446.(a)	447.(b)	448.(c)
449.(c)	450.(a)	451.(b)	452.(b)
453.(c)	454.(b)	455.(c)	456.(c)
457.(b)	458.(c)	459.(a)	460.(b)
461.(b)	462.(d)	463.(d)	464.(a)
465.(b)	466.(b)	467.(c)	468.(a)
469.(d)	470.(a)	471.(d)	472.(b)
473.(b)	474.(b)	475.(b)	476.(b)
477.(b)	478.(b)	479.(d)	480.(b)
481.(c)	482.(b)	483.(a)	484.(a)
485.(a)	486.(b)	487.(c)	488.(d)
489.(d)	490.(c)	491.(d)	492.(d)
493.(b)	494.(b)	495.(a)	496.(a)
497.(c)	498.(b)	499.(c)	500.(d)
501.(c)	502.(a)	503.(c)	504.(d)
505.(d)	506.(b)	507.(c)	508.(d)
509.(c)	510.(b)	511.(a)	512.(b)
513.(a)	514.(c)	515.(b)	516.(d)
517.(b)	518.(b)	519.(a)	520.(c)
521.(c)	522.(b)	523.(a)	524.(d)
525.(c)	526.(a)	527.(d)	528.(b)
529.(c)	530.(b)	531.(d)	532.(b)
533.(b)	534.(a)	535.(a)	536.(c)
537.(a)	538.(b)	539.(a)	540.(b)
541.(a)	542.(b)	543.(d)	544.(d)
545.(b)	546.(b)	547.(a)	548.(b)
549.(c)	550.(b)	551.(a)	552.(d)
553.(b)	554.(d)	555.(a)	556.(c)
557.(b)	558.(d)	559.(a)	560.(d)
561.(d)	562.(c)	563.(c)	564.(d)
565.(c)	566.(d)	567.(b)	568.(d)
569.(c)	570.(b)	571.(c)	572.(a)
573.(c)	574.(a)	575.(c)	576.(c)
577.(a)	578.(c)	579.(b)	580.(d)
581.(c)	582.(b)	583.(b)	584.(d)

585.(d)	586.(c)	587.(d)	588.(d)
589.(d)	590.(b)	591.(c)	592.(c)
593.(c)	594.(c)	595.(b)	596.(a)
597.(c)	598.(c)	599.(b)	600.(b)
601.(b)	602.(d)	603.(b)	604.(a)
605.(b)	606.(c)	607.(a)	608.(c)
609.(d)	610.(a)	611.(a)	612.(d)
613.(c)	614.(a)	615.(c)	616.(a)
617.(b)	618.(d)	619.(d)	620.(b)
621.(a)	622.(a)	623.(c)	624.(a)
625.(c)	626.(a)	627.(d)	628.(a)
629.(a)	630.(a)	631.(d)	632.(a)
633.(a)	634.(b)	635.(c)	636.(a)
637.(c)	638.(d)	639.(b)	640.(b)
641.(a)	642.(c)	643.(c)	644.(c)
645.(c)	646.(d)	647.(d)	648.(b)
649.(a)	650.(c)	651.(c)	652.(b)
653.(c)	654.(b)	655.(c)	656.(b)
657.(c)	658.(d)	659.(b)	660.(b)
661.(a)	662.(a)	663.(d)	664.(d)
665.(a)	666.(c)	667.(c)	668.(d)
669.(c)	670.(c)	671.(a)	672.(d)
673.(b)	674.(c)	675.(a)	676.(c)
677.(a)	678.(a)	679.(d)	680.(d)
681.(a)	682.(a)	683.(a)	684.(a)
685.(a)	686.(a)	687.(b)	688.(a)
689.(d)	690.(a)	691.(c)	692.(c)
693.(c)	694.(c)	695.(c)	696.(b)
697.(c)	698.(c)	699.(b)	700.(c)
701.(b)	702.(a)	703.(d)	704.(d)
705.(c)	706.(b)	707.(b)	708.(d)
709.(a)	710.(a)	711.(c)	712.(c)
713.(b)	714.(c)	715.(b)	716.(a)
717.(c)	718.(c)	719.(a)	720.(d)
721.(d)	722.(d)	723.(c)	724.(c)
725.(b)	726.(c)	727.(b)	728.(c)
729.(b)	730.(a)	731.(d)	732.(c)
733.(a)	734.(b)	735.(c)	736.(d)
737.(c)	738.(a)	739.(a)	740.(d)
741.(c)	742.(a)	743.(d)	744.(d)
745.(d)	746.(c)	747.(d)	748.(b)
749.(d)	750.(d)	751.(c)	752.(c)
753.(a)	754.(b)	755.(b)	756.(c)
757.(d)	758.(d)	759.(a)	760.(a)
761.(d)	762.(b)	763.(a)	764.(b)
765.(b)	766.(c)	767.(d)	768.(b)

769.(b)	770.(c)	771.(b)	772.(b)
773.(b)	774.(a)	775.(b)	776.(d)
777.(d)	778.(d)	779.(d)	780.(c)
781.(d)	782.(a)	783.(d)	784.(a)
785.(d)	786.(a)	787.(b)	788.(d)
789.(b)	790.(d)	791.(d)	792.(d)
793.(a)	794.(b)	795.(d)	796.(d)
797.(c)	798.(d)	799.(b)	800.(d)
801.(a)	802.(c)	803.(b)	804.(d)
805.(b)	806.(d)	807.(b)	808.(d)
809.(d)	810.(d)	811.(c)	812.(a)
813.(a)	814.(a)	815.(b)	816.(b)
817.(d)	818.(d)	819.(d)	

Solutions:-

Sol.1.(a) $0.4\overline{24} = \frac{424-4}{990} = \frac{420}{990} = \frac{14}{33}$

Sol.2.(a) $0.1\overline{6} + 0.1\overline{5} - 0.1\overline{3}$

$= \frac{16-1}{90} + \frac{15-1}{90} - \frac{13-1}{90} = \frac{17}{90}$

Sol.3.(a) $5^3 \times 5^4 \times 5^2 = 5^{3+4+2} = 5^9$

Sol.4.(a) $(\frac{1}{3})^{-3} + (\frac{1}{5})^{-4} + (\frac{1}{15})^{-2}$

$= 27 + 625 + 225 = 877$

Sol.5.(b) $(\sqrt{360} + 12 \div 6 \times 3 - \sqrt{170}) \div 2$

$\Rightarrow (6\sqrt{10} + 6 - \sqrt{170}) \div 2$

$\Rightarrow (6 \times 3.16 + 6 - 13.03) \div 2$

$\Rightarrow (18.96 + 6 - 13.03) \div 2 \sim 12 \div 2 = 6$

Sol.6.(c) $3x(x-6) + x^2 + 6x - 9 + 24 - x^3$

$\Rightarrow 3x^2 - 18x + x^2 + 6x - 9 + 24 - x^3$

$\Rightarrow 15 - 12x + 4x^2 - x^3$

Sol.7.(a) $\frac{(a+\frac{1}{b})^r (a-\frac{1}{b})^s}{(b+\frac{1}{a})^r (b-\frac{1}{a})^s}$

$= \frac{(\frac{ab+1}{b})^r (\frac{ab-1}{b})^s}{(\frac{ab+1}{a})^r (\frac{ab-1}{a})^s} = \frac{\frac{1}{b^{r+s}}}{\frac{1}{a^{r+s}}} = (\frac{a}{b})^{r+s}$

Sol.8.(d) $2^{3k-5} = 4096$

$\Rightarrow 2^{3k-5} = 2^{12} \Rightarrow 3k - 5 = 12$

$\Rightarrow 3k = 12 + 5 \Rightarrow 3k = 17 \Rightarrow k = \frac{17}{3}$

Sol.9.(d) $\frac{4.32 \times 4.32 - 2.64 \times 2.64}{1.68}$

$= \frac{(4.32 + 2.64)(4.32 - 2.64)}{1.68}$

$= \frac{6.96 \times 1.68}{1.68} = 6.96$

Sol.10.(b) $a^2 - b^2 = (a + b)(a - b)$

$(x^2 + m^2 - z^2)^2 - (x^2 - m^2 + z^2)^2$
$= (x^2 + m^2 - z^2 + x^2 - m^2 + z^2)$
$[(x^2 + m^2 - z^2) - (x^2 - m^2 + z^2)]$
$= 2x^2 (2m^2 - 2z^2) = 4x^2 (m^2 - z^2)$

Sol.11.(a) $\frac{1}{3}, \frac{4}{7}, \frac{2}{5}, \frac{5}{6}, \frac{3}{5}$
= 0.33 , 0.57 , 0.4 , 0.83 , 0.6
In ascending , 0.33 , 0.4 , 0.57 , 0.6 , 0.83
$\Rightarrow \frac{1}{3}, \frac{2}{5}, \frac{4}{7}, \frac{3}{5}, \frac{5}{6}$

Sol.12.(d) $\frac{a+1}{a} = k,$

$put\ a = 2, 3\ldots\ldots\ ; k = \frac{3}{2}$

Then satisfy by option,

Then , $\frac{a^2 - 1}{a^2} = 2k - k^2$

Sol.13.(d) $0.2\overline{36} = \frac{236-2}{990} = \frac{234}{990} = \frac{13}{55}$

Sol.14.(c)

$(a + 2b - c)(b - c) + (a - c)2b + b^2$
$= ab + 2b^2 - bc - ac - 2bc$
$+ c^2 + 2ab - 2bc + b^2$
$= 3b^2 + c^2 + 3ab - 5bc - ac$

Sol.15.(b) Let the denominator be x , numerator be (x - 1)

$\frac{x-1+6}{x} = \frac{5}{4} \Rightarrow 4x + 20 = 5x$
$\Rightarrow 5x - 4x = 20 \Rightarrow x = 20$
Required fraction = $\frac{19}{20}$

Sol.16.(c) Number of rows
$= \sqrt{21025} = 145$

Sol.17.(d) $\frac{a^{10} \times b^{-7} \times c^{-4}}{a^{-5} \times b^2 \times c^5}$
$= a^{10-(-5)} \times b^{-7-2} \times c^{-4-5}$
$= a^{15} \times b^{-9} \times c^{-9}$

Sol.18.(a)

$\sqrt{75 + \sqrt{41 - \sqrt{21 + \sqrt{19 - \sqrt{9}}}}}$
$= \sqrt{75 + \sqrt{41 - \sqrt{21 + \sqrt{19 - 3}}}}$
$= \sqrt{75 + \sqrt{41 - \sqrt{21 + \sqrt{16}}}}$
$= \sqrt{75 + \sqrt{41 - \sqrt{25}}}$
$= \sqrt{75 + \sqrt{41 - 5}} = \sqrt{75 + \sqrt{36}}$
$= \sqrt{75 + 6} = \sqrt{81} = 9$

Sol.19.(d)

$(\frac{12}{7})^5 \times (\frac{12}{7})^8 \times (\frac{12}{7})^{16} = (\frac{7}{12})^{2m+10}$
$\Rightarrow (\frac{7}{12})^{-5} \times (\frac{7}{12})^8 \times (\frac{7}{12})^{-16} = (\frac{7}{12})^{2m+10}$
$\Rightarrow (\frac{7}{12})^{(-5+8-16)} = (\frac{7}{12})^{2m+10}$
$\Rightarrow -13 = 2m + 10 \Rightarrow 2m = -13 - 10$
$\Rightarrow 2m = -23 \Rightarrow m = \frac{-23}{2}$

Sol.20.(d)

$\frac{6 + 6 \times 6}{3 \times 3 + 5} \div \frac{\frac{1}{2} \div \frac{1}{2} of \frac{1}{2}}{\frac{1}{2} \div \frac{1}{2} \times \frac{1}{2}}$
$= \frac{42}{14} \div \frac{2 \times 2}{1} = \frac{42}{14} \times \frac{1}{4} = \frac{3}{4}$

Sol.21.(b) $\frac{7893}{9990} = 0.7\overline{900}$

Sol.22.(c)
$[(k^a)^{b-c} \times (k^b)^{c-a} \times (k^c)^{a-b}] \times (x^0 - 1)$
We know, $x^0 = 1$
$[(k^a)^{b-c} \times (k^b)^{c-a} \times (k^c)^{a-b}] \times (1 - 1)$
$[(k^a)^{b-c} \times (k^b)^{c-a} \times (k^c)^{a-b}] \times 0 = 0$

Sol.23.(d)

$\left[x^{m(n-p)} . x^{n(p-m)} . x^{p(m-n)}\right]\left[\sqrt[4]{625} - \sqrt{25}\right]$
$= [x^{mn-mp} . x^{np-nm} . x^{pm-pn}]$
$\left[\sqrt[4]{625} - \sqrt{25}\right]$
$= [x^0] \times (5 - 5) = 0$

Sol.24.(a) $x = -\frac{1}{2}$ and $y = 2$

$\frac{4y}{5}(y - x) - 35[\frac{3x-4y}{5} - \frac{1}{10}\{3x -$
$\frac{5}{7}(7x - 4y)\}]$
$= \frac{8}{5}(2 + \frac{1}{2}) - 35[\frac{-1.5-8}{5} - 0.1$
$\{\frac{-3}{2} + \frac{115}{14}\}] = 4 - 35[\frac{-19}{10} - \frac{47}{70}]$
$= 4 - 35[\frac{-180}{70}] = 4 + 90 = 94$

Sol.25.(a) Sum of these numbers,
(7xy + 5yz - 3zx) + (4yz + 9zx - 4y) + (- 3xy + 5x - 2xy)
$\Rightarrow$ 7xy + 5yz - 3zx + 4yz + 9zx - 4y - 3xy + 5x - 2xy
$\Rightarrow$ 7xy - 3xy - 2xy + 5yz + 4yz - 3zx + 9zx - 4y + 5x
$\Rightarrow$ 2xy + 9yz + 6zx - 4y + 5x
= 5x - 4y + 2xy + 9yz + 6zx

Sol.26.(b) Greatest number = 0.85
Smallest number = 0.03
Product = 0.85 × 0.03 = 0.0255

Sol.27.(c) 0.46 × 137.5 = 63.25
Again,
460 × 1.375 = 632.5

Sol.28.(c) 919 + 9.019 + 0.919 + 9.0019
= 928.019 + 0.919 + 9.0019 $\Rightarrow$ 937.9399

Sol.29.(c) $\frac{12}{\frac{13}{14}} - \frac{\frac{12}{13}}{14} = \frac{168}{13} - \frac{12}{182}$
$= \frac{2352 - 12}{182} = \frac{2340}{182} = 12\frac{6}{7}$

Sol.30.(c)
$\frac{5.5^3 - 4^3}{30.25 + 22 + 16} = \frac{102.375}{68.25} = 1.5$

Sol.31.(d) $\frac{1}{11.91} = 0.083963\ then,$

$\frac{1}{0.0001191} = 10^5 \times 0.083963$

Sol.32.(a)
P = 2 + 0.2 ÷ (0.2 x 2) - 1 x 2 = 0.5
Q = 2 - 0.2 ÷ (0.2 x 2) - $\frac{1}{2}$ x 2 = 0.5,
Then $\frac{P}{Q} = \frac{0.5}{0.5} = 1.0$

Sol.33.(c) A tennis player in his career won 5 matches, lost 12 matches and had 3 matches as a draw. So, the fraction of the matches he lost in his career is
$\rightarrow \frac{12}{20} = \frac{3}{5}$

Sol.34.(c) The number of loaves that Sunila can made with the flour
$= 9\frac{1}{4} \div 1\frac{1}{8} = \frac{37}{4} \times \frac{8}{9} = \frac{74}{9}$
$= 8.222 \simeq 8$

Sol.35.(d) $f(x) = \frac{x+1}{x-1}$
Putting x = 2 $\Rightarrow$ f(2) = $\frac{2+1}{2-1} = 3$

Sol.36.(b) $\sqrt{54} + \sqrt{150} = 19.60$
$= 3\sqrt{6} + 5\sqrt{6} = 19.60$
$= 8\sqrt{6} = 19.60 \Rightarrow \sqrt{6} = \frac{19.60}{8} = 2.45$
Now, $\sqrt{216} + \sqrt{96}$
$= 6\sqrt{6} + 4\sqrt{6} = 10\sqrt{6} = 10 \times 2.45 = 24.5$

Sol.37.(b) (8 + 27 + 64 + ...+ 1000)
+ (2 + 4 + 6 + ...+ 20)
$= (2^3 + 3^3 + 4^3 + \ldots\ldots + 10^3)$
$+ (2 + 4 + 6 + \ldots\ldots 20)$
$= \left[(\frac{10 \times 11}{2})^2 - 1\right] + 10 \times 11$
= 3025 - 1 + 110 = 3134

Sol.38.(d) $\frac{2^{10} - 3^{10}}{5^{10} - 6^{10}}$
We can see that, in numerator and denominator it has -ve value. So, the fraction is a +ve Rational Number.

Sol.39.(b)
$\sqrt{1350} = \sqrt{1350} = \sqrt{15 \times 15 \times 6} = 15\sqrt{6}$

Sol.40.(c)

One-thirds are there in 72 = 72 × 3 = 216

Sol.41.(b) Let the fraction = $\frac{x}{y}$

When the numerator increases by 20% it will be = 120% of x= $1.2x$

When the denominator decreases by 50%, it will be = 0.5y

A/Q,

$\frac{1.2x}{0.5y} = \frac{5}{6} \Rightarrow \frac{x}{y} = \frac{25}{72}$

Sol.42.(d) $\frac{1}{2+\frac{1}{3+\frac{1}{1+\frac{1}{4}}}}$

$= \frac{1}{2+\frac{1}{3+\frac{4}{5}}} = \frac{1}{2+\frac{5}{19}} = \frac{19}{43}$

Sol.43.(a) Given , $\sqrt{2116}$ = 46

$= \sqrt{21.16} + \sqrt{0.2116} + \sqrt{0.002116}$

$+ \sqrt{0.00002116}$.

= 4.6 + 0.46 + 0.046 + 0.0046 = 5.1106

Sol.44.(b) $0.9 \oplus 0.1$

$= 0.9 - 0.1 + \frac{1}{\sqrt{0.9 \times 0.1}} + \sqrt{\frac{0.9}{0.1}}$

$= 0.8 + \frac{1}{0.3} + 3 = \frac{8}{10} + \frac{10}{3} + 3$

$= \frac{24+100+90}{30} = \frac{214}{30}$

Sol.45.(d) $\frac{1}{2} + \frac{1}{6} + \frac{1}{12} + ...$

$+ \frac{1}{n(n+1)} = \frac{1}{1} - \frac{1}{(n+1)} = \frac{n}{n+1}$

Sol.46.(c) $47^{7.5} \div 47^{3/2} \times 47^{-3} = (\sqrt{47})^?$

$\Rightarrow 47^{(7.5-1.5)} \times 47^{-3} = (\sqrt{47})^?$

$\Rightarrow 47^{6} \times 47^{-3} = (\sqrt{47})^?$

$\Rightarrow 47^{3} = (\sqrt{47})^? \Rightarrow ? = 6$

Sol.47.(c) $Let\sqrt{6+\sqrt{6+\sqrt{6+}}}$..... = x

Squaring both sides, we get

$\Rightarrow x^2 = 6 + \sqrt{6+\sqrt{6+}}$.....

$\Rightarrow x^2 = 6 + x \Rightarrow x^2 - x - 6 = 0$

$\Rightarrow x^2 - 3x + 2x - 6 = 0$

$\Rightarrow x(x-3) + 2(x-3) = 0$

$\Rightarrow (x-3)(x+2) = 0 \Rightarrow x = 3 \; or \; -2$

Positive value of x = 3

Sol.48.(a) $\frac{3\sqrt{2}}{\sqrt{6}+\sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}} - \frac{6}{\sqrt{8}-\sqrt{12}}$

On rationalizing all terms

$= \frac{3\sqrt{2}(\sqrt{6}-\sqrt{3})}{(\sqrt{6}+\sqrt{3})(\sqrt{6}-\sqrt{3})} - \frac{4\sqrt{3}(\sqrt{6}-\sqrt{2})}{(\sqrt{6}+\sqrt{2})(\sqrt{6}-\sqrt{2})}$

$- \frac{6(\sqrt{8}+\sqrt{12})}{(\sqrt{8}-\sqrt{12})(\sqrt{8}+\sqrt{12})}$

$= 2\sqrt{3} - \sqrt{6} - 3\sqrt{2} + \sqrt{6} + 3\sqrt{2} + 3\sqrt{3} = 5\sqrt{3}$

Sol.49.(c) $\sqrt{0.0025} \times \sqrt{2.25} \times \sqrt{0.0625}$

= 0.05 × 1.5 × 0.25 = 0.01875

Sol.50.(c) $\frac{1}{5.8} + \frac{1}{8.11} + \frac{1}{11.14} + \frac{1}{14.17}$

$= \frac{1}{5\times8} + \frac{1}{8\times11} + \frac{1}{11\times14} + \frac{1}{14\times17}$

$= \frac{1}{3} \times [\frac{1}{5} - \frac{1}{8} + \frac{1}{8} - \frac{1}{11} + \frac{1}{11} - \frac{1}{14}$

$+ \frac{1}{14} - \frac{1}{17} = \frac{1}{3} \times \frac{12}{85} = \frac{4}{85}$

Sol.51.(d) (0.00314) (0.0393)(0.0001)

$= \frac{314 \times 393 \times 1}{100000 \times 10000 \times 10000}$

= (0.314) (0.00393) (0.00001)

Sol.52.(d) $\frac{100}{11}$ is non - terminating repeating decimal number.

Note :- A non-terminating, non-repeating decimal is a decimal number that continues endlessly, with no group of digits repeating endlessly. Decimals of this type cannot be represented as fractions, and as a result are irrational numbers. Pi is a non-terminating, non-repeating decimal.

Sol.53.(c) For non terminating decimals the denominator should have more factors except 2 and 5.

Sol.54.(a) $(\frac{*}{21}) \times (\frac{*}{189}) = 1$

$\Rightarrow *^2 = 21 \times 189 = 3969 \Rightarrow * = 63$

Sol.55.(c) 1.5X = 0.05Y $\Rightarrow \frac{15X}{10} = \frac{5Y}{100}$

$\Rightarrow \frac{X}{Y} = \frac{5}{100} \times \frac{10}{15} = \frac{1}{30}$

Now , $\frac{Y-X}{Y+X} = \frac{30-1}{30+1} = \frac{29}{31}$ = 0.9354

Sol.56.(d) Let the number = x

A/Q, $\frac{x}{3} - \frac{x}{4} = \sqrt{x} \Rightarrow \frac{x}{12} = \sqrt{x}$

$\Rightarrow \sqrt{x} = 12 \Rightarrow x = 144$

Sol.57.(b) If series are in the form of

$\frac{1}{a\times b} + \frac{1}{b\times c} + \frac{1}{c\times d} + \frac{1}{d\times e} + \frac{1}{e\times f}$

$+ \_\_\_\_\_ + \frac{1}{(n-1)\times n}$

then its value will be = $[1 - \frac{1}{n}]$

Given series $\frac{1}{1\times2} + \frac{1}{2\times3} + \frac{1}{3\times4} +$

$\frac{1}{4\times5} + \frac{1}{5\times6} + \_\_\_\_\_ + \frac{1}{9\times10}$

Hence its value will be $[1 - \frac{1}{10}] = \frac{9}{10}$

Sol.58.(d) Let number be x

$= x \times \frac{2}{3} \times \frac{1}{4} = 32 \Rightarrow x = 16 \times 12 = 192$

Sol.59.(a) A.T.Q .,

Length of the steel bar = 50m

worker cut the bar in the length of 5.25m

So, worker can cut as many as possible bars → $\frac{Total\ length\ of\ bar}{5.25}$

$= \frac{50}{5.25}$ = 9.52

Therefore,

Remaining parts of the bar

= 50 – (9.52×5.25) = 0.02

Sol.60.(d) Let the other fraction be x

ATQ,

$\frac{3}{4}$ + x = $\frac{5}{6}$

$x = \frac{5}{6} - \frac{3}{4} = \frac{10-9}{12} = \frac{1}{12}$

Sol.61.(a) The square root of 5776 = 76

7	5776	76
7	49	
146	876	
	876	
	0	

Sol.62.(d)

$3\frac{1}{12} - [1 - \frac{3}{4} + \{2\frac{1}{2} - (1\frac{1}{2} - \frac{1}{3})\}]$

$\Rightarrow \frac{37}{12} - [\frac{1}{4} + \{\frac{5}{2} - (\frac{3}{2} - \frac{1}{3})\}]$

$\Rightarrow \frac{37}{12} - [\frac{1}{4} + \{\frac{5}{2} - \frac{7}{6}\}]$

$\Rightarrow \frac{37}{12} - [\frac{1}{4} + \frac{4}{3}]$

$= \frac{37}{12} - \frac{19}{12} = \frac{18}{12} = \frac{3}{2}$

So, the reciprocal of $\frac{3}{2} = \frac{2}{3}$

Sol.63.(b) $\frac{1}{300} = 0.00\overline{3}$

Sol.64.(c)

Given that the value of x = 0.5747474

$\Rightarrow x = 0.5\overline{74}$

$\Rightarrow x = \frac{574-5}{990} = \frac{569}{990}$

Sol.65.(a) 1cm = $\frac{1}{100000}$km

36cm = $\frac{36}{100000}$km = 0.00036 km

Sol.66.(d) 25.19 × 3 + 4.41 - 0.9 = ?

79.98 - 0.90 = 79.08 = 79 (approx) because it is the closest option given

Sol.67.(d) 27 ÷ 3 - 27 × 0 + 1 = 9 - 0 + 1 = 10

Sol.68.(d)

$0.6 + (\sqrt{0.81} - (\sqrt{0.0144} + 0.4 \div 0.5))$

= 0.6 + (0.9 - (0.12 + 0.8))

= 0.6 + (0.9 - 0.92) = 0.58

Sol.69.(a) Total number of digits after the decimal point = 6

6124.8 × 625.5 × 0.0043
= 61.248 × 6255 × 0.043

Sol.70.(b) $(3^2)^3+(2^3)^2 = 9^3+8^2$
$= 729 + 64 = 793$

Sol.71.(c) $2^x \times 4^{12} \times 8^3 = 16^{11}$
$\Rightarrow 2^x \times 2^{24} \times 2^9 = 2^{44} \Rightarrow 2^{33+x} = 2^{44}$
$\Rightarrow 33 + x = 44 \Rightarrow x = 44 - 33 = 11$

Sol.72.(c) $\frac{x}{y} = \frac{3}{2}$, $\frac{x^2+y^2}{x^2-y^2}$
$= \frac{9+4}{9-4} = \frac{13}{5}$

Sol.73.(c) $2.666\ldots + 2.77\ldots$
$= 2 + \frac{6}{9} + 2 + \frac{7}{9} = 4\frac{13}{9} = \frac{49}{9}$

Sol.74.(d) $0.474747\ldots = \frac{47}{99}$

Sol.75.(b) $\frac{10}{100} \times \frac{24}{100} \times x = 240$
$x = \frac{240 \times 100 \times 100}{10 \times 24} = 10000$

Sol.76.(c) 26.52 × 3.89 - 7.79 × 2 + 27.39
= 27 × 4 - 8 × 2 + 27 = 108 - 16 + 27 = 119

Sol.77.(b)
$6(x^3 - 2x^2 + 3x) - (x^3 + 2x - 3)$
$= 6x^3 - 12x^2 + 18x - x^3 - 2x + 3$
$= 5x^3 - 12x^2 + 16x + 3$

Sol.78.(c) $\frac{8^2 \times 3^3}{\sqrt{64} \times \sqrt{81}} = \frac{8^2 \times 3^3}{8 \times 9} = 24$

Sol.79.(c)
$325 \times 5 + 31 \times 21 - 22 \times (63 - 52)$
$= 1625 + 651 - 22 \times 11$
$= 1625 + 651 - 242 = 2034$

Sol.80.(a) $6^2 + 7^2 + \sqrt{16}$
$\Rightarrow 36 + 49 + 4 = 89$

Sol.81.(b) $1.\overline{24} = \frac{124-1}{99} \Rightarrow \frac{123}{99} = \frac{41}{33}$

Sol.82.(b) 4.2222....
$= 4 + 0.2222\ldots = 4 + \frac{2}{9} = \frac{38}{9}$

Sol.83.(a)
$234 \times [8 - (6 + 2) \times 3] + 4234$
$= 234 \times [8 - 24] + 4234$
$= 234 \times (-16) + 4234$
$= -3744 + 4234 = 490$

Sol.84.(a) $3^{x-2} + 3^x = 7290$
$\Rightarrow \frac{3^x}{9} + 3^x = 7290 \Rightarrow \frac{3^x(1+9)}{9} = 7290$
$\Rightarrow 3^x = \frac{7290 \times 9}{10} \Rightarrow 3^x = 3^8 \Rightarrow x = 8$

Sol.85.(c)
$\frac{3}{2}x^2 + 2x - \frac{3}{2} + \frac{x^2}{2} - 6x + \frac{1}{2}$
$= \frac{3}{2}x^2 + \frac{x^2}{2} - 4x - \frac{3}{2} + \frac{1}{2}$
$= 2x^2 - 4x - 1$

Sol.86.(d)
$\sqrt{\frac{0.030625}{0.001225}} = \sqrt{\frac{1225}{49}} = \frac{35}{7} = 5$

Sol.87.(b) $\sqrt{144} + \sqrt{0.0169} - \sqrt{4.41}$
$= 12 + 0.13 - 2.1 = 10.03$

Sol.88.(d) $(3^0 + 3^{-2} + 3^{-1}) \times 27$
$= (1 + \frac{1}{9} + \frac{1}{3}) \times 27 = \frac{13}{9} \times 27 = 39$

Sol.89.(c)
$= 125.99 - 35.92 + 3.89 \times 16.11$
= 126 - 36 + 4 × 16
= 126 - 36 + 64 = 190 - 36 = 154

Sol.90.(a) $4^2 + \sqrt{8^2} - 4\sqrt{25} - 10$
= 16 + 8 - 4 × 5 - 10 = 16 + 8 - 20 - 10 = - 6

Sol.91.(a) $\sqrt{29\frac{4}{25}} = \sqrt{\frac{729}{25}}$
$= \frac{27}{5} = 5.4$

Sol.92.(b) $\sqrt{729} + \sqrt{1681} + \sqrt{576} - \sqrt{1849}$
$= 27 + 41 + 24 - 43 = 49$

Sol.93.(d) $4\frac{7}{9} \times 7\frac{8}{9} \times 81 + 2\frac{3}{4}$
$= \frac{43}{9} \times \frac{71}{9} \times 81 + \frac{11}{4}$
$= 3053 + 2.75 = 3055.75$

Sol.94.(c) $(\frac{-2}{5})^{-2} \times (\frac{-4}{5})^4$
$= (\frac{5}{-2})^2 \times (\frac{-4}{5})^4 = \frac{25}{4} \times \frac{256}{625} = \frac{64}{25}$

Sol.95.(d) $12.999 - 3.998 + 14.002$
$\times 3.998 + 27.008 \div 3.001$
$+ 35.999 \div 5.998$
$= 13 - 4 + 14 \times 4 + 27 \div 3 + 36 \div 6$
$= 13 - 4 + 56 + 9 + 6 = 80$

Sol.96.(c) $x^2 + 5x - 12 - 3(x^2 - 2x + 9)$
$= x^2 + 5x - 12 - 3x^2 + 6x - 27$
$= -2x^2 + 11x - 39$

Sol.97.(a) $0.2\overline{7} = \frac{27-2}{90} = \frac{25}{90} = \frac{5}{18}$

Sol.98.(a) $\frac{423 \times 423 - 325 \times 325}{423 - 325}$
$= \frac{(423+325)(423-325)}{423-325}$
$= 423 + 325 = 748$

Sol.99.(a) 68.27 - 140.1 + 9.99 x 7.7
= 68 - 140 + 10 × 8 = 68 - 140 + 80 = 8

Sol.100.(.c) 12 + 12 × 12 - 12 ÷ 12
= 12 + 144 - 1 = 155

Sol.101.(d) $(\frac{2}{3} + \frac{1}{3}) \times 23 - 13 + 6$
$= 23 - 13 + 6 = 16$

Sol.102.(c) $\sqrt{625} - \sqrt{324} + 33^2$
$= 25 - 18 + 1089 = 1096$

Sol.103.(a)
$\sqrt{1234321} = \sqrt{1111 \times 1111} = 1111$

Sol.104.(c) $\frac{2}{3} + \frac{1}{1+\frac{4}{5}} - \frac{5}{6}$
$= \frac{2}{3} + \frac{5}{9} - \frac{5}{6} = \frac{7}{18}$

Sol.105.(c) Let the number be x
Now, $\frac{5x}{4} - \frac{3x}{4} = 6 \Rightarrow \frac{2x}{4} = 6 \Rightarrow x = 12$

Sol.106.(d)
$\sqrt{729} - \sqrt{400} = 27 - 20 = 7$

Sol.107.(d) $\Rightarrow (a - b)(a + b) = a^2 - b^2$
$(1.5a^2 - 2.5b^2)(1.5a^2 + 2.5b^2) + 6.25ab$
$= (1.5a^2)^2 - (2.5b^2)^2 + 6.25ab$
$= 2.25a^4 - 6.25b^4 + 6.25ab$

Sol.108.(d) 0.3125125125.....
$= 0.3\overline{125} = \frac{3125-3}{9990} = \frac{3122}{9990} = \frac{1561}{4995}$

Sol.109.(a) $\frac{\sqrt{729}}{15} \times \frac{25}{\sqrt{81}} \times \frac{15}{\sqrt{225}}$
$= \frac{27}{15} \times \frac{25}{9} \times \frac{15}{15} = 5$

Sol.110.(d)
$126.012 \times 14.987 - 603.045$
$= ? + 261.987$
$\Rightarrow 126 \times 15 - 603 = ? + 262$
$\Rightarrow ? = 1890 - 603 - 262 \Rightarrow ? = 1025$

Sol.111.(c) $25x^3 = 1600$
$\Rightarrow x^3 = 64 \Rightarrow x^3 = (4)^3$
We know that if powers is equal then base will be equal
Therefore x = 4

Sol.112.(b)
5 × 7 - [23 - {35 - (20 - x)}] = 42
⇒ 35 - [23 - {35 - 20 + x }] =42
⇒ 35 - [23 - 15 - x] = 42 ⇒ 35 - 8 + x = 42
⇒ 27 + x = 42 so, x = 15

Sol.113.(a)
$\sqrt{530} + 85 \div 24 \times 4 - \sqrt{255}) \div 3$
⇒(23 + 3.5 × 4 - 16) ÷ 3 ⇒ 21 ÷ 3 = 7

Sol.114.(b) $0.4\overline{32} = \frac{432-4}{990} \Rightarrow \frac{214}{495}$

Sol.115.(c) As per the question,

$x - \frac{x}{3} = 4 \Rightarrow \frac{2x}{3} = 4$

So, x = 6

Sol.116.(d) $0.13\overline{241} = \frac{13241-13}{99900}$

$= \frac{13228}{99900} = \frac{3307}{24975}$

Sol.117.(c)

$99.01 \div 10.93 + 6.987 \times 16.01$

$= 99 \div 11 + 7 \times 16 = 9 + 112 = 121$

Sol.118.(d)

$171 \times 172 \times 173 \div 17 = 1 \times 2 \times 3 = 6$

Sol.119.(c)

$3(5x^2 - 7) - 5(3x^2 + 2x - 7) = -16$

$\Rightarrow 15x^2 - 21 - 15x^2 - 10x + 35 = -16$

$\Rightarrow 10x = 14 + 16 \Rightarrow 10x = 30 \Rightarrow x = 3$

Sol.120.(b) $\{(234^5 - 243^8 + \frac{1}{72})^{-8}\}^0 + 8$

$= 1 + 8 = 9 \qquad [a^0 = 1]$

Sol.121.(c)

$\frac{1}{4} + \frac{2}{5} \div [\{2\frac{1}{5} - 2\} \times 5] - \frac{2}{3} \times \frac{3}{5}$

$= \frac{1}{4} + \frac{2}{5} - \frac{2}{5} = \frac{1}{4}$

Sol.122.(a) 0.4363636.....

$= 0.4\overline{36} = \frac{4363-43}{9900} = \frac{24}{55}$

Sol.123.(a)

$(12x - z) - (2x - 3y + 7z + 4z - 5x)$

$= (12x - z) - (-3x - 3y + 11z)$

$= 12x - z + 3x + 3y - 11z$

$= 15x + 3y - 12z$

Sol.124.(b) $\sqrt{9604} = \sqrt{2\times2\times7\times7\times7\times7}$

$= 2\times7\times7 = 98$

Sol.125.(b) $\frac{3}{7} + \frac{2}{7} + \frac{1}{14} + \frac{2}{7} - 3$

$= (\frac{3}{7} + \frac{2}{7} + \frac{2}{7}) - 3 + \frac{1}{14}$

$= 1 - 3 + \frac{1}{14} = -2 + \frac{1}{14} = \frac{-27}{14}$

Sol.126.(b)

$\frac{0.2\times0.2\times0.2 - 0.02\times0.02\times0.02}{2\times2\times2}$

$= \frac{(0.2-0.02)(0.04+0.0004+0.004)}{8}$

$= \frac{0.18\times0.0444}{8} = 0.000999$

Sol.127.(d)

$x(2x - 5) + 6(x^2 - 4) + 18$

$= 2x^2 - 5x + 6x^2 - 24 + 18$

$= 8x^2 - 5x - 6$

Sol.128.(c) 9991 × 10009

= (10000 - 9) × (10000 + 9)

= 100000000 - 81 = 99,999,919

Sol.129.(a)

$2(\frac{3}{2}x^2 - 24x + 12) - 3(x^2 + 4x - 13)$

$= 3x^2 - 48x + 24 - 3x^2 - 12x + 39$

$= -60x + 63$

Sol.130.(c)

$(\sqrt{142} + 52 \div 26 \times 5 - \sqrt{80}) \times 2$

$= (\sqrt{142} + 52 \div 26 \times 5 - \sqrt{80}) \times 2$

= (12 + 10 - 9) × 2 = 26

(∵ On using approximation rule)

Sol.131.(a) 7.44.... + 3.77.... - 2.55....

$= 7 + 3 - 2 + \frac{44}{99} + \frac{77}{99} - \frac{55}{99} = 8\frac{6}{9} = \frac{78}{9}$

Sol.132.(d) $\frac{2.46\times2.46 - 1.46\times1.46}{2.46 - 1.46}$

$= \frac{(2.46+1.46)(2.46-1.46)}{2.46-1.46}$

$= 2.46 + 1.46 = 3.92 = \frac{392}{100}$

Sol.133.(a) $(18 \div 9) \times (-7 + 9) - 7 \times 2$

$= 2 \times 2 - 14 = -10$

Sol.134.(b) $\frac{0.5\times10.6 - 0.2\times1.4}{0.4}$

$= \frac{5.3 - 0.28}{0.4} = \frac{5.02}{0.4} = 12.55$

Sol.135.(a) 121.12 × 0.121 = 14.65552

Sol.136.(c)

$x^3 - 3x^2 + 9x - 12 - x^3 - 7x^2 - 8x - 16$

$= -10x^2 + x - 28$

Sol.137.(c) $\sqrt{1.0201} = \sqrt{\frac{10201}{10000}}$

$= \sqrt{\frac{101\times101}{100\times100}} = 1.01$

Sol.138.(c)

$3(9x^3 - 6x^2 + 30) - 9(3x^3 - 2x + 30)$

$= 27x^3 - 18x^2 + 90 - 27x^3 + 18x - 270$

$= 18x^2 + 18x - 180 = -18(x^2 - x + 10$

Sol.139.(b) $(\frac{-5}{3}) \times (\frac{9}{25}) + (\frac{1}{5} - 2)$

$= \frac{-3}{5} + \frac{-9}{5} = \frac{-12}{5}$

Sol.140.(b) $2^3 \times 3^2 \times 7$

$\Rightarrow 8 \times 9 \times 7 = 504$

Sol.141.(d)

$\frac{(0.11)^2 + (0.06)^2 + (0.031)^2}{(0.011)^2 + (0.006)^2 + (0.0031)^2}$

$= \frac{0.0121 + 0.0036 + 0.000961}{0.000121 + 0.000036 + 0.00000961}$

$= \frac{0.016661}{0.00016661} = 100$

Sol.142.(c) $\sqrt{(34^2 - 16^2)}$

$= \sqrt{(34 + 16)(34 - 16)} = \sqrt{50 \times 18} = 30$

Sol.143.(c) $(13^2 - 5^2)^{\frac{3}{2}} \times 8^{\frac{2}{3}} \div (\frac{1}{6})^{-3}$

= 1728 × 4 ÷ 216 = 32

Sol.144.(c) $0.7\overline{94} + 0.8\overline{76}$

$= \frac{794-7}{990} + \frac{876-8}{990}$

$= \frac{787}{990} + \frac{868}{990} = \frac{1655}{990} = 1\frac{133}{198}$

Sol.145.(d)

$\frac{1+x}{1-x} - \frac{1-x}{1+x} + \frac{4x}{1+x^2} + \frac{8x^3}{1-x^4}$

$= \frac{4x}{(1-x)(1+x)} + \frac{4x}{1+x^2} + \frac{8x^3}{1-x^4}$

$= \frac{4x}{1-x^2} + \frac{4x}{1+x^2} + \frac{8x^3}{1-x^4}$

$= \frac{8x}{1-x^4} + \frac{8x^3}{1-x^4} = \frac{8x(1+x^2)}{1-x^4}$

$= \frac{8x(1+x^2)}{(1-x^2)(1+x^2)} = \frac{8x}{1-x^2}$

Sol.146.(c)

$\sqrt{74529} = \sqrt{3\times3\times7\times7\times13\times13} = 273$

Sol.147.(d) a = 5,then

$\sqrt{(4a^2 - 4a + 1)} + 6a$

$= \sqrt{100 - 20 + 1} + 30 = 9 + 30 = 39$

Sol.148.(b) $(\frac{64}{25})^{-\frac{3}{2}} \times (\frac{2}{5})^4 \div \sqrt[5]{(32)^{-3}}$

$= (\frac{8}{5})^{2\times\frac{-3}{2}} \times \frac{16}{625} \div 2^{5\times\frac{-3}{2}}$

$= \frac{125}{512} \times \frac{16}{625} \times 8 = \frac{1}{20}$

Sol.149.(b) Solving the equation we get

$\frac{1\frac{2}{3} + 2\frac{1}{2} \times \frac{2}{3}}{5 - 4\frac{1}{2} \div \frac{3}{2}} = \frac{\frac{5}{3} + \frac{5}{3}}{5 - 3} = \frac{10}{3\times2}$

$= \frac{5}{3} = 1\frac{2}{3}$

Sol.150.(c) $0.9\overline{87} - 0.7\overline{56}$

$\Rightarrow \frac{987-9}{990} - \frac{756-7}{990} \Rightarrow \frac{978}{990} - \frac{749}{990}$

$\Rightarrow \frac{978-749}{990} = \frac{229}{990}$

Sol.151.(c) We know that $a^3 - b^3$

$= (a - b)(a^2 + b^2 + ab)$

$\frac{3-5x^2}{1-x^3} + \frac{1}{1-x} - \frac{5x+4}{1+x+x^2}$

$\Rightarrow \frac{3-5x^2+1+x+x^2-(5x+4)(1-x)}{(1-x)(1+x+x^2)}$

$\Rightarrow \frac{3-5x^2+1+x+x^2-5x+5x^2-4+4x}{(1-x)(1+x+x^2)}$

$\Rightarrow \frac{x^2}{1-x^3}$

Sol.152.(a)

$(\sqrt[3]{\frac{8}{125}})^2 \times (\sqrt[3]{\frac{64}{27}})^2 \div (\frac{4}{5})^2$

$(\frac{2}{5})^2 \times (\frac{4}{3})^2 \times \frac{25}{16}$

$\Rightarrow \frac{4}{25} \times \frac{16}{9} \times \frac{25}{16} = \frac{4}{9}$

Sol.153.(d) We know that,
1000 gram = 1 kilogram
So, 1 gram = $\frac{1}{1000}$ kg
Therefore , 25 gram
= $\frac{1}{1000} \times 25 \Rightarrow \frac{1}{40}$ kg

Sol.154.(a) $4.\overline{567} \Rightarrow \frac{4567-45}{990}$

$\Rightarrow \frac{4522}{990} = \frac{2261}{495} = 4\frac{281}{495}$

Sol.155.(d) $(\frac{512}{125})^3 \times (\frac{512}{125})^k = (\frac{8}{5})^{15}$

$\Rightarrow (\frac{8}{5})^{3\times 3} \times (\frac{8}{5})^{3\times k} = (\frac{8}{5})^{15}$

$\Rightarrow (\frac{8}{5})^{3\times k+9} = (\frac{8}{5})^{15}$

If two equal terms have the same base, then we can equate their powers.
$\Rightarrow$ 3k + 9 = 15 $\Rightarrow$ 3k = 6
So, k = 2

Sol.156.(a) $\sqrt{1025} + 98 \div 14 \times 4 - \sqrt{170}$
$\Rightarrow$ 32 + 28 - 13 = 47

Sol.157.(c) $7.8\overline{964} \Rightarrow \frac{78964-78}{9990}$

$\Rightarrow \frac{78886}{9990} = \frac{39443}{4995} \Rightarrow 7\frac{4478}{4995}$

Sol.158.(b) $a^3 - b^3 = (a-b)(a^2+b^2+ab)$

$\frac{183\times183\times183-73\times73\times73}{183\times183+183\times73+73\times73}$

$\Rightarrow \frac{183^3-73^3}{183^2+183\times73+73^2}$

$\Rightarrow \frac{|(183-73)(183^2+183\times73+73^2)}{183^2+183\times73+73^2}$

= 183 − 73 = 110

Sol.159.(a) $0.3\overline{59} \Rightarrow \frac{359-3}{990}$

$\Rightarrow \frac{356}{990} = \frac{178}{495}$

Sol.160.(a) $\frac{(9.8\times9.8-5.8\times5.8)}{2\times(7.8)}$

$= \frac{(9.8+5.8)(9.8-5.8)}{2\times7.8} = \frac{15.6\times4}{2\times7.8} = 4$

Sol.161.(d) $5\sqrt{6} - \sqrt{[3(4-2)]} + (\frac{12}{\sqrt{6}})$

$= 5\sqrt{6} - \sqrt{6} + 2\sqrt{6} = 6\sqrt{6}$

Sol.162.(d)

$\sqrt{625} + \sqrt{0.25} - \sqrt{0.000025}$
$= 25 + 0.5 - 0.005 = 25.495$

Sol.163.(c) $39 \div \{6 \times (\frac{6}{7} \text{ of } \frac{7}{8})\}$

$= 39 \div \{6 \times \frac{3}{4}\} = 39 \div \frac{9}{2}$

$= 39 \times \frac{2}{9} = \frac{26}{3}$

Sol.164.(d) $(0.1 \times 0.001 \times 0.000 \times 10^6)$

$= \frac{1}{100000000} \times 10^6 = \frac{1}{100}$

Sol.165.(b) $9x = 55^2 - 35^2$

$\Rightarrow 9x = 3025 - 1225$

$\Rightarrow 9x = 1800 \Rightarrow x = 200$

Sol.166.(c) $0.4\overline{35} = \frac{435-4}{990} = \frac{431}{990}$

Sol.167.(d)

(279 ÷ 31) + (363 ÷ 33) - (512 ÷ 16)
$\Rightarrow$ 9 + 11 - 32 = -12

Sol.168.(b) $\sqrt{(1-\frac{99}{2500})} = \frac{49}{\sqrt{x}}$

$\Rightarrow \frac{2500-99}{2500} = \frac{49^2}{(\sqrt{x})^2} \Rightarrow \frac{2401}{2500} = \frac{2401}{(\sqrt{x})^2}$

So, x = 2500

Sol.169.(c) $0.1\overline{7} = \frac{17-1}{90} \Rightarrow \frac{8}{45}$

Sol.170.(a)

$(2^{25} \div 2^{15}) \times 2^4 \Rightarrow 2^{25-15} \times 2^4$
$\Rightarrow 2^{10} \times 2^4 \Rightarrow 2^{10+4} \Rightarrow 2^{14}$

Sol.171.(b) $\{14 + (2\frac{1}{2} + \frac{4}{5} + 1)\} \times \frac{1}{100} \Rightarrow \{14 + (\frac{5}{2} + \frac{4}{5} + 1)\} \times \frac{1}{100}$

$\Rightarrow \{14 + \frac{25+8+10}{10}\} \times \frac{1}{100}$

$\Rightarrow \frac{140+25+8+10}{10} \times \frac{1}{100}$

$\Rightarrow \frac{183}{10} \times \frac{1}{100} = 0.183$

Sol.172.(b) $\frac{9}{10} \div (\frac{4}{5} + \frac{1}{10})$

$\Rightarrow \frac{9}{10} \div (\frac{8+1}{10}) \Rightarrow \frac{9}{10} \times \frac{10}{9} = 1$

Sol.173.(d) $0.\overline{3} = \frac{3}{9} = \frac{1}{3}$

Sol.174.(c) 597 × 603
= (600 - 3) × (600 + 3)
$= 600^2 - 3^2 = 360000 - 9 = 359991$

Sol.175.(d)
222.22 + 22.22 + 12 + 0.22 + 0.02
= 244.44 + 12.24 = 256.68

Sol.176.(d) $5^5 \times 125^{\frac{-2}{3}} \times (25)^{\frac{-1}{2}}$

$= 5^5 \times 5^{3\times\frac{-2}{3}} \times 5^{2\times\frac{-1}{2}} = 5^5 \times 5^{-2} \times 5^{-1}$

$= 5^{(5-2-1)} = 5^2 = 25$

Sol.177.(d) $\frac{12^3\times6^2\times8}{4^5\times3^5}$

$= \frac{3^3\times4^3\times3^2\times2^2\times2^3}{4^5\times3^5} = \frac{32}{16} = 2$

Sol.178.(a) $(34)^3 = (30+4)^3$

$= 30^3 + 4^3 + 3\times30\times4(30+4)$
$= 27000 + 64 + 12240 = 39304$

Sol.179.(c) 1.5x = 0.02y $\Rightarrow \frac{x}{y} = \frac{0.02}{1.5}$

Then the value of

$\frac{1}{(\frac{y+x}{y-x})} = \frac{1}{\frac{1.5+0.02}{1.5-0.02}} = \frac{1.48}{1.52} = \frac{37}{38}$

Sol.180.(b) $8.\overline{46} = \frac{846-8}{99} = \frac{838}{99}$

Sol.181.(b)

$\sqrt{0.04} + \sqrt{6.25} + \sqrt{12.25} - 8.2$
$= 0.2 + 2.5 + 3.5 - 8.2 = 6.2 - 8.2$
= - 2

Sol.182.(c) $(625)^{\frac{-1}{2}} = \sqrt{\frac{1}{625}} = \frac{1}{25}$
$= 0.04$

Sol.183.(a) $\sqrt{190 + \sqrt{11 + \sqrt{617 + 8}}}$

$= \sqrt{190 + \sqrt{11 + \sqrt{625}}}$
$= \sqrt{190 + \sqrt{11 + 25}} = \sqrt{190 + \sqrt{36}}$
$= \sqrt{190 + 6} = \sqrt{196} = 14$

Sol.184.(b) $0.\overline{696} \times 0.\overline{27}$

$= \frac{696}{999} \times \frac{27}{99} = \frac{18792}{98901} = \frac{2088}{10989}$

Sol.185.(c) $9.46\overline{7} - 2.46\overline{7} + 4.46\overline{7}$

$= \frac{9467-946}{900} - \frac{2467-246}{900} + \frac{4467-446}{900}$

$= \frac{8521}{900} - \frac{2221}{900} + \frac{4021}{900} = \frac{10321}{900}$

Sol.186.(a)

$[[(0.413)\div(0.00413)] - 74.27 - 25.72]$
$= 100 - 99.99 = 0.01$

Sol.187.(a) $\sqrt{1225} + \sqrt{6.25} + \sqrt{12.25} - 8$
$= 35 + 2.5 + 3.5 - 8 = 33$

Sol.188.(a) 25 - [7 + 7 of (33 - 4 × 23)]
= 25 - [7 + 7 of (-59)] = 25 - [7 - 413]
= 25 - (- 406) = 25 + 406 = 431

Sol.189.(a) $\frac{1}{\frac{4}{5}+\frac{3}{7}} \div \frac{8}{35}$
$= \frac{35}{43} \div \frac{8}{35} = \frac{35}{43} \times \frac{35}{8}$
$= \frac{1225}{344} = 3\frac{193}{344}$

Sol.190.(c) $3^{-5} \times 4^{-5} \times 5^{-5}$
$= (3 \times 4 \times 5)^{-5} = 60^{-5} = \frac{1}{60^5}$

Sol.191.(c) $5^{n+2} = 3125$
$\Rightarrow 5^{n+2} = 5^5 \Rightarrow n = n + 2 = 5$
$\Rightarrow n = 5 - 2 = 3$

Sol.192.(b) $\frac{\sqrt{1296}}{\sqrt{121}} \times \frac{15}{(216)^{\frac{1}{3}}} \times \frac{11}{\sqrt{225}}$
$= \frac{36}{11} \times \frac{15}{6} \times \frac{11}{15} = 6$

Sol.193.(d) $[(\frac{5}{8})^{-7} \times (\frac{8}{5})^{-4} \times (\frac{1}{4})^{-3}]^{-3}$
$= [(\frac{5}{8})^{-7} \times (\frac{5}{8})^{4} \times (\frac{1}{4})^{-3}]^{-3}$
$= [(\frac{5}{8})^{-3} \times (\frac{1}{4})^{-3}]^{-3} = [(\frac{8}{5})^{3} \times 4^3]^{-3}$
$= [(\frac{32}{5})^3]^{-3} = (\frac{5}{32})^9$

Sol.194.(d) We know that
$(a+b)^2 - (a-b)^2$
$= 4ab\ (4pq + 3q)^2 - (4pq - 3q)^2$
$= 4 \times 4pq \times 3q = 48pq^2$

Sol.195.(a) $(\frac{1}{2})^{-2} + (\frac{1}{3})^{-2} + (\frac{1}{4})^{-2}$
$= 2^2 + 3^2 + 4^2 = 4 + 9 + 16 = 29$

Sol.196.(d)
$11.96 + 4.96 + 12.16 - 11.89 \times 2.04$
$= 12 + 5 + 12 - 12 \times 2 = 5$

Sol.197.(b) $\frac{23}{11} = 2.\overline{09}$

Sol.198.(d) $(\frac{25}{9})^{x+1}(\frac{81}{625})^{x-1} = \frac{9}{25}$
$\Rightarrow (\frac{5}{3})^{2(x+1)} \times (\frac{3}{5})^{4(x-1)} = (\frac{3}{5})^2$
$\Rightarrow (\frac{3}{5})^{-2(x+1)} \times (\frac{3}{5})^{4(x-1)} = (\frac{3}{5})^2$
$\Rightarrow (\frac{3}{5})^{-2x-2+4x-4} = (\frac{3}{5})^2$
$\Rightarrow 2x - 6 = 2 \Rightarrow 2x = 8 \Rightarrow x = 4$

Sol.199.(b)
$(6 - 3) \div [(9 - 6) \div \{(6 - 4) \div (2 + \frac{8}{13})\}]$
$= 3 \div [3 \div \{2 \div \frac{34}{13}\}] = 3 \div [3 \div \{2 \times \frac{13}{34}\}]$
$= 3 \div [3 \times \frac{17}{13}] = 3 \times \frac{13}{51} = \frac{13}{17}$

Sol.200.(c) $5^{X+Y} = 125$
$5^{X+Y} = 5^3$
x + y = 3.....(i)
$5^{X-Y} = 3125 \Rightarrow 5^{X-Y} = 5^5$
x - y = 5.....(ii)
On solving equation (i) and (ii),
x = 4 and y = -1

Sol.201.(c)
$20 - [12 - \{14 - (12 - \overline{16 - 10})\}]$
20 - [12 - {14 - (12 - 6)}]
20 - [12 - 8] = 20 - 4 = 16

Sol.202.(c) $0.5\overline{323} = \frac{2659}{4995}$

Sol.203.(d) $0.\overline{64} = \frac{64}{99}$

Sol.204.(a) $\frac{5}{7}, \frac{9}{14}, \frac{16}{21}, \frac{29}{42}$
$\frac{5}{7} = 0.714$, $\frac{9}{14} = 0.642$
$\frac{16}{21} = 0.761$, $\frac{29}{42} = 0.690$
So, $\frac{16}{21}$ is the largest.
Short trick:-
Make denominator equal and compare the numerator.
$\frac{30}{42}, \frac{27}{42}, \frac{32}{42}, \frac{29}{42}$
So, $\frac{16}{21}$ is the largest.

Sol.205.(d) LCM of denominator = 48
Make denominator equal,
$\frac{5}{6} = \frac{40}{48}$, $\frac{7}{8} = \frac{42}{48}$
$\frac{11}{12} = \frac{44}{48}$, $\frac{13}{16} = \frac{39}{48}$
So, smallest fraction = $\frac{13}{16}$, largest fraction = $\frac{11}{12}$
Difference = $\frac{11}{12} - \frac{13}{16} = \frac{44-39}{48} = \frac{5}{48}$

Sol.206.(b) 3 + 3 × [{11 −2 } ÷ 3] − 2 × 3
= 3 + 3 × 3 - 2 × 3 = 3 + 9 - 6 = 6

Sol.207.(c)
$[(12 \div 4) \times \{\frac{12}{3} + \frac{5}{3} \times (7 - 4)\}]$
$= [3 \times \{\frac{12}{3} + \frac{5}{3} \times 3\} = [3 \times \{\frac{12}{3} + 5\}]$
$= 3 \times \{\frac{27}{3}\} = 27$

Sol.208.(d) 4515 ÷12.9 = 350
Similarly,
4.515 ÷ 12.9 = 0.35

Sol.209.(c) $a^3 + b^3 + c^3 = 3abc$
(if a + b + c = 0)
23 - 11 - 12 = 0
$23^3 + (-11)^3 + (-12)^3 = 3 \times 23 \times 11 \times 12$
= 9,108

Sol.210.(c) $\frac{(40.25 \div 5) + (0.07 \times 5)}{(0.15 \times 8) + (0.18 \div 0.2)}$
$= \frac{8.05 + 0.35}{1.2 + 0.9} = \frac{8.40}{2.1} = 4$

Sol.211.(a) $\sqrt{18496} = 136$,
Then, $\sqrt{184.96} - \sqrt{1.8496}$
$= 13.6 - 1.36 = 12.24$

Sol.212.(a) 60% of 28 % of 250
$= \frac{60}{100} \times \frac{28}{100} \times 250 = 42$

Sol.213.(a) $4^{-5} \div 4^7 \times 4^{-6} = 4^{(-5-7-6)} = 4^{-18}$

Sol.214.(c) $[(12 \div \frac{4}{3}) \times \{6 \div 4 \times (\frac{12-7}{6})\} \div \{4 \times 6 \div 3\}]$
$= [9 \times \{6 \div 4 \times (\frac{5}{6})\} \div 8]$
$= [9 \times \{\frac{3}{2} \times \frac{5}{6}\} \div 8]$
$= [9 \times \frac{5}{4} \div 8] = [9 \times \frac{5}{32}] = \frac{45}{32}$
$= 1\frac{13}{32}$

Sol.215.(d) $4^2 - 3\ (8)^{\frac{2}{3}} + (\frac{16}{9})^{\frac{1}{2}}$
$= 16 - 3 \times 4 + \frac{4}{3} = \frac{16}{3} = 5\frac{1}{3}$

Sol.216.(d) $2405 \div 13 \times 6 + 35$
$= 185 \times 6 + 35 = 1110 + 35 = 1145$

Sol.217.(d) $0.2\overline{6} = \frac{26-2}{90} = \frac{24}{90} = \frac{4}{15}$

Sol.218.(b)
$a^3 - b^3 = (a-b)(a^2 + b^2 + ab)$
$16^3 - 12^3 = (16 - 12)(16^2 + 12^2 + 16 \times 12)$
= 4 (256 + 144 + 192) = 4 × 592 = 2368

Sol.219.(d)
$6^0 \times 4^2 \times 2^{-4} = 1 \times 16 \times \frac{1}{16} = 1$

Sol.220.(d) $\frac{.1 \times .1 \times .1 + .02 \times .02 \times .02}{.2 \times .2 \times .2 + .04 \times .04 \times .04}$
$= \frac{0.001 + 0.000008}{0.008 + 0.000016} = \frac{0.001008}{0.008016} = 0.125$

Sol.221.(c) 7.98 × 2 + 3.96 × 6 −18 ÷ 2 + 1 = 8 × 2 + 4 × 6 − 9 + 1
= 16 + 24 − 9 + 1 = 32

Sol.222.(c) $11.45\overline{65} \div 2.\overline{67}$

$= 11\frac{4565-45}{9900} \div 2\frac{67}{99}$

$= 11\frac{452}{990} \times \frac{99}{265}$

$= \frac{11342}{990} \times \frac{99}{265} = 4\frac{7}{25}$

Sol.223.(b) $0.8\overline{7} = \frac{87-8}{90} = \frac{79}{90}$

Sol.224.(c)

$216^{\frac{2}{3}} + \frac{1}{256^{-\frac{3}{4}}} + 32^{\frac{1}{5}} - \frac{1}{10^{-2}} - 2$

$= \sqrt[3]{216^2} + \sqrt[4]{256^3} + \sqrt[5]{2^5} - 10^2 - 2$

= 36 + 64 + 2 - 100 - 2 = 0

Sol.225.(d) $326.\overline{786} - 10.19\overline{3}$

$= 326 - 10 + 0.\overline{786} - 0.19\overline{3}$

$= 316 + \frac{786}{999} - \frac{193-19}{900}$

$= 316 + \frac{786}{999} - \frac{174}{900}$

$= 316 + \frac{78600-19314}{99900}$

$= 316 + \frac{59286}{99900} = 316 + \frac{59286+59}{99900}$

$= 316 + \frac{59345}{99900} = 316.59\overline{345}$

Sol.226.(a) $(x-5)(x+3)$

$= x^2 + 3x - 5x - 15 = x^2 - 2x - 15$

Sol.227.(b) m = - 9 and n = 13

$25m^2 + 40mn + 16n^2 = (5m + 4n)^2$

$= \{5 \times (-9) + 4 \times (13)\}^2 = (-45 + 52)^2 = 49$

Sol.228.(b) $0.3\overline{35} = \frac{335-3}{990} = \frac{332}{990}$

Sol.229.(b) $(3.7)^3 - 3 \times (3.7)^2 \times 0.7 + 3 \times (3.7) \times (0.7)^2 - (0.7)^3$

$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$

Here, a = 3.7 and b = 0.7

$(3.7 - 0.7)^3 = 27$

Sol.230.(d)

$40 - [3 - \{4 - (6 - \overline{6-4})\}]$

= 40 - [3 - {4 - 4} = 40 - [3] = 37

Sol.231.(d) $\sqrt{21} = 4.58$,

Then, $\sqrt{\frac{7}{3}} = \sqrt{\frac{7\times3}{3\times3}} = \sqrt{\frac{21}{9}}$

$= \frac{\sqrt{21}}{3} = \frac{4.58}{3} = 1.527$

Sol.232.(b) Let the positive fraction be x to be added. $(\frac{3}{5} \times \frac{16}{21} \times \frac{7}{10} \times \frac{3}{4})$

$= \frac{6}{25}$ Nearest whole number is 1 So,

$\Rightarrow \frac{6}{25} + x = 1 \Rightarrow x = 1 - \frac{6}{25} = \frac{19}{25}$

Sol.233.(b) $\frac{y}{x} = \frac{5}{6}$ *then* $\frac{x^2-y^2}{x^2+y^2}$

$= \frac{36-25}{36+25} = \frac{11}{61}$

Sol.234.(d) $\sqrt{6}$ = 2.45, then

$\sqrt{6} + \sqrt{24} + \sqrt{54}$

$= \sqrt{6} + 2\sqrt{6} + 3\sqrt{6} = 6\sqrt{6}$

$= 6 \times 2.45 = 14.70$

Sol.235.(b)

$123.4\overline{7} = \frac{12347-1234}{90} = \frac{11113}{90}$

Sol.236.(d)

Nearest perfect square from 369 is 400.

So, number should be added

= 400 - 369 = 31

Sol.237.(a) let the number be x

ATQ,

$x + \frac{x}{3} = 12 \Rightarrow \frac{4x}{3} = 12$

therefore, x = 9

Sol.238.(b) Let the first part be x and the other part be 3x.

$x + 3x = 128$

$\Rightarrow 4x = 128 \Rightarrow x = 32$

Now, the larger part is 96.

Sol.239.(c) $(\frac{1}{512})^{\frac{-2}{3}} \div (\frac{1}{64})^{\frac{-4}{3}}$

$= 8^{-3\times\frac{-2}{3}} \div 4^{-3\times\frac{-4}{3}}$

$= 8^2 \div 4^4 = 4^3 \div 4^4 = 4^{-1} = \frac{1}{4}$

Sol.240.(b) $5.\overline{7} = \frac{57-5}{9} = \frac{52}{9}$

Sol.241.(a)

Let the three parts be x , y and z.

$x + y + z = 68$..... (1)

$x + 2 = y - 2 = \frac{z}{2}$

$x + 2 = y - 2 = \frac{z}{2} = k$

Then,

$x = k - 2$, $y = k + 2$ *and* $z = 2k$..... (2)

Now, put the value of x ,y and z in eq .(1)

$4k = 68 \Rightarrow k = 17$

Hence, the third part z = 2k = 34

Sol.242.(b)

$\sqrt{\frac{\sqrt{211600}+\sqrt{400}}{48000}} = \sqrt{\frac{460+20}{48000}}$

$= \sqrt{\frac{1}{100}} = \frac{1}{10}$

Sol.243.(b)

$\frac{140 \times 140 + 280 \times 450 \div 3 + 150 \times 150}{290}$

$= \frac{19600 + 280 \times 150 + 22500}{290}$

$= \frac{19600 + 42000 + 22500}{290} = \frac{84100}{290} = 290$

Sol.244.(d) $\frac{9^4 \times 10^3 \times 4^{-4} \times 16^{\frac{1}{2}}}{5^6 \times 3^6}$

$= \frac{6561 \times 1000}{15625 \times 64 \times 729} = \frac{9}{1000}$

Sol.245.(c)

$0.3\overline{72} = \frac{372-3}{990} = \frac{369}{990}$ *or* $\frac{41}{110} = \frac{x}{y}$

$(x + y) = 110 + 41 = 151$

Sol.246.(a)

$\frac{[(34.45)]^2 - (11.75)^2] \times 5.15}{[(25.75)^2 + (25.75 \times 20.45)] \times 22.7}$

$= \frac{(34.45 + 11.75)(34.45 - 11.75) \times 5.15}{25.75(25.75 + 20.45) \times 22.7}$

$= \frac{46.2 \times 22.7 \times 5.15}{25.75 \times 46.2 \times 22.7} = \frac{1}{5}$

Sol.247.(a)

$4.\overline{142} = \frac{4142-4}{999} = \frac{4138}{999}$

Sol.248.(c) $0.72\overline{45} = \frac{7245-72}{9900} = \frac{7173}{9900}$

or $\frac{797}{1100}$, a = 797 and b = 1100

b - a = 1100 - 797 = 303

Sol.249.(c)

$(x + 2))(2x + 5)(x - 4) + x^2 + 5x - 12$

$= (2x^2 + 4x + 5x + 10)(x - 4) + x^2 + 5x - 12$

$= 2x^3 + 9x^2 + 10x - 8x^2 - 36x - 40 + x^2 + 5x - 12$

$= 2x^3 + 2x^2 - 21x - 52$

Sol.250.(b)

$(3x + 4)^2 + (3x - 4)^2 + (3x + 4)(3x - 4)$

$= 2(9x^2 + 16) + (9x^2 - 16)$

$= 18x^2 + 32 + 9x^2 - 16 = 27x^2 + 16$

Sol.251.(a)

$\frac{[(0.68)^2 + (0.32)^2 + 16 \times 0.0136]}{[(0.68)^3 - (0.32)^3] \div (0.3)^2}$

$\frac{[(0.68)^2 + (0.32)^2 + 16 \times 0.0136]}{(0.68 - 0.32)[(0.68)^2 + (0.32)^2 + 16 \times 0.0136] \div 0.09}$

$= \frac{1}{0.36 \div 0.09} = \frac{1}{4}$

Sol.252.(c) $0.02\overline{16} = \frac{216}{9990}$ or $\frac{4}{185}$

Denominator - numerator = 185 - 4 = 181

Sol.253.(c)

$[\{(9261)^{\frac{1}{3}} \div 81^{\frac{1}{4}}\}^2 \times \{\sqrt[4]{1296}\}]$

$= \{21 \div 3\}^2 \times 6 = 49 \times 6 = 294$

Sol.254.(c) $(\frac{32}{243})^k = \frac{8}{27} \Rightarrow (\frac{2}{3})^{5k} = (\frac{2}{3})^3$

$\Rightarrow 5k = 3 \Rightarrow k = \frac{3}{5}$

Sol.255.(d) $\frac{(0.42)^2+36(0.05)^2}{9(0.21)^2+(0.45)^2}$

$\Rightarrow \frac{7\times6\times7\times6+36(5\times5)}{9(7\times3\times7\times3)+(9\times5\times9\times5)}$

$\Rightarrow \frac{36(49+25)}{81(49+25)} = \frac{36}{81} = \frac{4}{9}$

Sol.256.(b) x = $(\sqrt{2352} \div \sqrt{1200}) \div \sqrt{0.04}$

$\Rightarrow \frac{28\sqrt{3}}{20\sqrt{3}} \times \frac{1}{0.2} = 7$

As per the question,

$\frac{x+1}{x-1} = \frac{7+1}{7-1} \Rightarrow \frac{4}{3}$

Sol.257.(c) 0.25a = 0.05 b $\Rightarrow \frac{a}{b} = \frac{1}{5}$

ATQ,

$\frac{b-a}{b+a} = \frac{5-1}{5+1} = \frac{4}{6} = 0.67$

Sol.258.(b) Let number be x

ATQ,

$\frac{x}{3} - x = 6 \Rightarrow \frac{-2x}{3} = 6$

So x = -9

Sol.259.(a)

$4(\frac{3}{2}x^2 - 4x + 3) - \frac{1}{2}(4x^2 + 8x - 18)$

$\Rightarrow 2(3x^2 - 8x + 6) - (2x^2 + 4x - 9)$

$\Rightarrow 6x^2 - 16x + 12 - 2x^2 - 4x + 9$

$= 4x^2 - 20x + 21$

Sol.260.(c) $0.\overline{06} \times 8.\overline{3}$

$\frac{6}{99} \times \frac{83-8}{9} = \frac{6}{99} \times \frac{75}{9} = \frac{50}{99} \Rightarrow 0.\overline{50}$

Sol.261.(b)

$\frac{5}{2}x^2 + 4x + \frac{3}{2} + \frac{x^2}{2} - 6x + \frac{5}{2}$

$= (\frac{5}{2}x^2 + \frac{x^2}{2}) - 2x + (\frac{3}{2} + \frac{5}{2}) = 3x^2 - 2x + 4$

Sol.262.(d) $(\sqrt{1008} \div \sqrt{448}) \times \sqrt{0.16}$

$\Rightarrow (\sqrt{\frac{1008}{448}}) \times .4 = (\sqrt{\frac{9}{4}}) \times .4$

$= \frac{3}{2} \times .4 = .6$

Sol.263.(d) $0.\overline{12} = \frac{12}{99} = \frac{4}{33}$

Sol.264.(d) 0.045 + 0.154 − 0.09 + 1.5 − (0.3 × 0.8) = x − 0.231

$\Rightarrow 1.609 - 0.24 = x - 0.231$

$\Rightarrow x = 1.369 + 0.231 = 1.6$

So, the value of x lie between 1.5 and 1.8

Sol.265.(d) $3.\overline{31} = \frac{331-3}{99} = \frac{328}{99}$

Sol.266.(c) 722 : 1083

H.C.F of 722 and 1083 is 361.

So, $\frac{722 \div 361}{1083 \div 361} = 2 : 3$

Sol.267.(d) $0.\overline{25} = \frac{25}{99}$

Sol.268.(d) $\frac{x}{9} = \frac{105}{63} = \frac{5}{y}$

Now, $\frac{x}{9} = \frac{105}{63} \Rightarrow x = 15$

$x = 15$ and $\frac{5}{y} = \frac{105}{63} \Rightarrow y = 3$

Hence , option (d) is the right answer.

Sol.269.(a) 3x(x + 2) - 5x(x - 3) + 7

$\Rightarrow 3x^2 + 6x - 5x^2 + 15x + 7 \Rightarrow -2x^2 + 21x + 7$

Sol.270.(d) $0.2\overline{7} = \frac{27-2}{90} = \frac{5}{18}$

Sol.271.(c) x = $\frac{\sqrt{1125} \times \sqrt{405}}{\sqrt{729}}$

$\Rightarrow \frac{\sqrt{1125 \times 405}}{\sqrt{729}} \Rightarrow \frac{675}{27} = 25$

Therefore , $\sqrt{x} = 5$

Sol.272.(a) $\frac{5}{12} = 0.4166\ldots = 0.41\overline{6}$

Sol.273.(d) $\sqrt{21 + \sqrt{19 - \sqrt{6+3}}}$

$\Rightarrow \sqrt{21 + \sqrt{19 - \sqrt{9}}} \Rightarrow \sqrt{21 + \sqrt{19-3}}$

$\Rightarrow \sqrt{21 + \sqrt{16}} \Rightarrow \sqrt{21+4} = \sqrt{25} = 5$

Sol.274.(b) 3x(x - 9) - 9x² + 2x + 24 - x³

3x(x - 9) - 9x² + 2x + 24 - x³

3x² - 27x - 9x² + 2x + 24 - x³

24 - 25x - 6x² - x³

Sol.275.(c) $(\frac{16a^{\frac{4}{3}}b^{\frac{-5}{6}}}{a^{\frac{-2}{3}}b^{\frac{1}{6}}})^{\frac{1}{2}} =$

$\sqrt{16a^{\frac{4}{3}+\frac{2}{3}} \times b^{\frac{-5}{6}-\frac{1}{6}}} = \sqrt{16a^2 \times b^{-1}} = \frac{4a}{b^{\frac{1}{2}}}$

Sol.276.(b) $\sqrt{y} \div \sqrt{121} = 0.03$

$\sqrt{y} \div 11 = 0.03 = \sqrt{y} = 0.03 \times 11$

$\sqrt{y} = 0.33 = y = 0.109$

Sol.277.(b) $3x(x-3) + 2(3x^2 - 4)$

$3x^2 - 9x + 6x^2 - 8 = 9x^2 - 9x - 8$

Sol.278.(c) $216^{\frac{2}{n}} = 36$

$(6)^{3\times\frac{2}{n}} = 6^2 \Rightarrow (6)^{\frac{6}{n}} = 6^2$

$\frac{6}{n} = 2 \Rightarrow n = 3$

Sol.279.(a) $(\frac{-5}{7})^{-6} \times (\frac{-5}{7})^{4}$

When base is same,

$a^b \times a^c = a^{b+c}$

$(\frac{-5}{7})^{-6} \times (\frac{-5}{7})^{4} = (\frac{-5}{7})^{-6+4}$

$= (\frac{-5}{7})^{-2} = (\frac{-7}{5})^{2} = \frac{49}{25}$

Sol.280.(a) $\sqrt{2 + \sqrt{2 + \sqrt{2 \ldots\ldots\ldots is}}}$

Let $\sqrt{2 + \sqrt{2 + \sqrt{2 \ldots\ldots\ldots}}} = x$

$2 + \sqrt{2 + \sqrt{2 + \sqrt{2 \ldots\ldots\ldots}}} = x^2$

$\sqrt{2 + \sqrt{2 + \sqrt{2 \ldots\ldots\ldots}}} = x^2 - 2$

$\Rightarrow x = x^2 - 2 \Rightarrow x^2 - x - 2 = 0 \Rightarrow x = 2, -1$

So, the square of any number can't be negative. Hence 2 is the appropriate answer.

Short trick:-

2 = 1 × 2 (always bigger number)

So, $\sqrt{2 + \sqrt{2 + \sqrt{2 \ldots\ldots\ldots}}} = 2$

Sol.281.(a) $0.1\overline{82} = \frac{182-1}{990} = \frac{181}{990}$

Sol.282.(d) $(3^{-1} \times 6^{-1})^{-1} \div 3^{-1}$

$(\frac{1}{3} \times \frac{1}{6})^{-1} \times 3 \Rightarrow 3 \times 6 \times 3 = 54$

Sol.283.(b)

$\sqrt{\frac{(0.05)^2 + (0.15)^2 + (0.053)^2}{0.005^2 + 0.015^2 + 0.0053^2}}$

$\sqrt{\frac{0.0025 + 0.0225 + 0.002809}{\frac{1}{100}(0.0025 + 0.0225 + 0.002809)}} = 10$

Sol.284.(b)

Numerator of all the fractions is equal.

So, the fraction with the greatest denominator is the smallest fraction.

So, the smallest fraction = $\frac{1981}{155}$

Sol.285.(c) $2^{-7} \times 2^{3n+4} = 2^{11} \div 2^5$

Base is same,

-7 + 3n + 4 = 11 - 5

3n + 4 = 6 + 7 $\Rightarrow$ 3n = 9 = n = 3

Sol.286.(c)

$\sqrt{8836} + \sqrt{6084} - \sqrt{1849}$

= 94 + 78 - 43 = 129

Sol.287.(a)

$a = (0.\overline{29} + 0.3\overline{2}) \times (0.\overline{2} + 0.\overline{15}) + 0.\overline{3}$

$a = (\frac{29}{99} + \frac{32-3}{90}) \times (\frac{2}{9} + \frac{15}{99}) + \frac{3}{9}$

$a = (\frac{290+319}{990}) \times (\frac{22+15}{99}) + \frac{3}{9}$

$a = \frac{609}{990} \times \frac{37}{99} + \frac{3}{9}$

$a = \frac{22533}{98010} + \frac{3}{9} = 0.5632$

Sol.288.(a) $x = 0.\overline{27} \div 3.\overline{2}$

$x = \frac{27}{99} \div \frac{32-3}{9}$

$\Rightarrow x = \frac{27}{99} \times \frac{9}{29} = \frac{27}{319}$

Sum of numerator and denominator
= 27 + 319 = 346

Sol.289.(d) $2.\overline{6} = \frac{26-2}{9} = \frac{24}{9} = \frac{8}{3}$

Sol.290.(d)

$(-2)^4 \div (-2)^6 \Rightarrow 16 \div 64 = \frac{1}{4}$

Sol.291.(a) $3\frac{1}{2} + 2\frac{5}{7} \times y - \frac{1}{2} \div 2 = 4\frac{1}{4}$

$\frac{7}{2} + \frac{19}{7} \times y - \frac{1}{4} = \frac{17}{4}$

$\frac{7}{2} + \frac{19}{7} \times y = \frac{17}{4} + \frac{1}{4}$

$\frac{19}{7} \times y = \frac{18}{4} - \frac{7}{2}$

$\frac{19}{7} \times y = 1 = y = \frac{7}{19}$

Sol.292.(b) $\left(\frac{(xy^2z)^{-3}}{y^{-3}}\right)^2 = \frac{1}{x^6y^6z^6}$

Sol.293.(d) $-2 - [3 - \{3 - (4 - 5)\}]$
$-2 - [3 - 4] = -2 + 1 = -1$

Sol.294.(d) $1 - 2 \times [\{-2(2 + 3) \times 20\} \div 2]$
$1 - 2 \times [-100] = 1 + 200 = 201$

Sol.295.(a)
1.345 + 13.45 + 0.1354 + 0.0596
= 11.453 − 0.543 + k
14.99 = 10.91 + k ⇒ K = 4.08

Sol.296.(d)
$56 \div 14 \times 2^2 - 12 \times 6 \div 3 + 10 = z$
$56 \div 14 \times 4 - 12 \times 6 \div 3 + 10 = z$
$4 \times 4 - 12 \times 2 + 10 = z$
$16 - 24 + 10 = z \Rightarrow 26 - 24 = z \Rightarrow z = 2$

Sol.297.(b) 0.17y = 10.2

$y = \frac{10.2}{0.17} \Rightarrow \frac{1020}{17}$

So, y = 60

Sol.298.(a) $\frac{12 - 6 \div 2 + 4}{3^2 \times 3 - 7 + 6}$

$= \frac{12 - 3 + 4}{9 \times 3 - 7 + 6} \Rightarrow \frac{16 - 3}{27 - 7 + 6}$

$= \frac{13}{26} = \frac{1}{2}$

Sol.299.(b) $1 - \frac{(4 \div 5 - 1 \times 3 + 2) \times 8}{3^2 \times 8 - 4 \times 2}$

$= 1 - \frac{\left(\frac{4}{5} - 3 + 2\right) \times 8}{9 \times 8 - 4 \times 2}$

$= 1 - \frac{\left(\frac{14}{5} - 3\right) \times 8}{72 - 8} \Rightarrow 1 - \frac{\left(-\frac{1}{5}\right) \times 8}{64}$

$= 1 + \frac{1}{40} = \frac{41}{40}$

Sol.300.(d)

$\sqrt{0.25} + 2\sqrt{0.0049} - 0.3\sqrt{0.09}$
= 0.5 + 2 × 0.07 - 0.3 × 0.3
= 0.5 + 0.14 - 0.09 ⇒ 0.55

Sol.301.(c)

$4\frac{1}{3} \div [2\frac{2}{3} - \frac{1}{3} \times (4\frac{1}{2} - 3\frac{1}{3})]$

$= \frac{13}{3} \div [\frac{8}{3} - \frac{1}{3} \times (\frac{9}{2} - \frac{10}{3})]$

$= \frac{13}{3} \div [\frac{8}{3} - \frac{1}{3} \times (\frac{7}{6})]$

$= \frac{13}{3} \div [\frac{41}{18}] = \frac{13}{3} \times [\frac{18}{41}]$

$\Rightarrow \frac{78}{41} = 1\frac{37}{41}$

Sol.302.(a)

$\frac{12 - [(3 - 5) \times 4] \div 8 - 8 + [6 \div (12 \times 2)]}{9 \times 15 \div (12 \times 10) - [12 \div (6 \times 2)]}$

$\Rightarrow \frac{12 - [(-2) \times 4] \div 8 - 8 + [6 \div 24]}{135 \div 120 - [12 \div 12]}$

$\Rightarrow \frac{12 - [-8] \div 8 - 8 + [0.25]}{\frac{9}{8} - [1]}$

$\Rightarrow \frac{12 + 1 - 8 + [0.25]}{\frac{1}{8}} \Rightarrow 5.25 \times 8 = 42$

Sol.303.(b) 81.7100 + 198.0020 - 2071.1985 + 9.0900 + 1591.42
⇒ 90.8 +198.0020 - 2071.1985 + 1591.42
⇒ 90.8 + 1789.422 - 2071.1985
⇒ 1880.222 - 2071.1985 ⇒ - 190.9765

Sol.304.(d)
6.05 - 15.95 ÷ 3.95 + 2.99 × 7.04
= 6 - 4 + 21 = 23

Sol.305.(c)

32% of 22.5 - $\frac{2}{3} \times \sqrt[3]{512} \times \sqrt{81}$ = y

7.2 - $\frac{2}{3} \times 8 \times 9$ = y

7.2 - 48 = y ⇒ y = -40.8

Sol.306.(d)
$27 \times 3 \times 896 \div \sqrt{3136} = y + 640$
$81 \times 896 \div 56 = y + 640$
$81 \times 16 = y + 640 \Rightarrow y = 656$

Sol.307.(b)

$\sqrt{\frac{\sqrt{1875}}{\sqrt{3888}} \times \frac{\sqrt{768}}{\sqrt{1200}}}$

$= \sqrt{\frac{\sqrt{1875}}{\sqrt{3888}} \times \frac{\sqrt{768}}{\sqrt{1200}}}$

$= \sqrt{\frac{25\sqrt{3}}{36\sqrt{3}} \times \frac{16\sqrt{3}}{20\sqrt{3}}} = \sqrt{\frac{25\sqrt{3}}{36\sqrt{3}} \times \frac{16\sqrt{3}}{20\sqrt{3}}}$

$= \frac{\sqrt{5}}{3}$

Sol.308.(b)
$36 \div (8 \times 3) - [3 \div \{4 \times \{3 \times 4 \div (5 - 9) + 6\}\}]$
$= 36 \div 24 - [3 \div \{4 \times \{3 \times 4 \div (-4) + 6\}\}]$
$= \frac{36}{24} - [3 \div 12]$
$= \frac{36}{24} - \frac{1}{4} = \frac{36-6}{24} = \frac{30}{24} = 1.25$

So, required answer is between 1 and 1.3

Sol.309.(b) $\frac{2}{3} + \frac{4}{9} \div \left(\frac{7}{2} - \frac{5}{6}\right)$

$= \frac{2}{3} + \frac{4}{9} \div \frac{16}{6} = \frac{2}{3} + \frac{4}{9} \times \frac{6}{16}$

$= \frac{2}{3} + \frac{1}{6} = \frac{5}{6}$

Sol.310.(d) $5 + \frac{5 \times 5}{5} - 5 = 5 + 5 - 5 \Rightarrow 5$

Sol.311.(b)

$\frac{(11\frac{11}{12} \times 1\frac{3}{13} \div 2\frac{3}{4}) \div (\frac{7}{10} \div (\frac{3}{4} \times 1\frac{2}{5}))}{\frac{1}{4} \times \frac{2}{3} \times 2\frac{2}{5}}$

$\frac{(\frac{143}{12} \times \frac{16}{13} \div \frac{11}{4}) \div (\frac{7}{10} \div (\frac{3}{4} \times \frac{7}{5}))}{\frac{1}{4} \times \frac{2}{3} \times \frac{12}{5}}$

$= \frac{(\frac{143}{12} \times \frac{16}{13} \times \frac{4}{11}) \div (\frac{7}{10} \times \frac{20}{21})}{\frac{1}{4} \times \frac{2}{3} \times \frac{12}{5}}$

$= \frac{(\frac{16}{3}) \times (\frac{3}{2})}{\frac{2}{5}} = \frac{(\frac{16}{3}) \times (\frac{3}{2})}{\frac{2}{5}} = 20$

Sol.312.(b) $(13)^3 + (-8)^3 + (-5)^3$
$= 2197 - 512 - 125 = 1560$ or 39×40

Sol.313.(c)
$49 - [35 + \{12 \div 3 \text{ of } (6 + \overline{7 - 12})\}]$
$= 49 - [35 + \{12 \div 3\}] = 49 - 39 = 10$

Sol.314.(c) As per question,

Required answer = $\frac{11}{6} - \frac{5}{9}$

$= \frac{33-10}{18} = \frac{23}{18} = 1\frac{5}{18}$

Sol.315.(c) $\left(1\frac{1}{3} \times 1\frac{4}{5} \div \frac{3}{5}\right) \times \frac{3}{8} - \frac{2}{3}$

$= \left(\frac{4}{3} \times \frac{9}{5} \div \frac{3}{5}\right) \times \frac{3}{8} - \frac{2}{3}$

$= \left(\frac{4}{3} \times \frac{9}{5} \times \frac{5}{3}\right) \times \frac{3}{8} - \frac{2}{3}$

$= 4 \times \frac{3}{8} - \frac{2}{3} \Rightarrow \frac{3}{2} - \frac{2}{3} = \frac{5}{6}$

Sol.316.(a) $\sqrt{64} - \sqrt[3]{64} = \sqrt[4]{y}$
$8 - 4 = \sqrt[4]{y} \Rightarrow 4 = \sqrt[4]{y} \Rightarrow y = 4^4 = 256$

Sol.317.(c) $\frac{1}{4}, \frac{4}{3}, \frac{5}{7}, \frac{5}{4}, \frac{8}{5}$

Reciprocal = $4, \frac{3}{4}, \frac{7}{5}, \frac{4}{5}, \frac{5}{8}$

Sum = $4 + \frac{3}{4} + \frac{7}{5} + \frac{4}{5} + \frac{5}{8}$

$= \frac{160 + 30 + 56 + 32 + 25}{40} = \frac{303}{40}$

So, reciprocal = $\frac{40}{303}$

Sol.318.(c) $7\frac{3}{5} \times 4\frac{1}{2} - k = 26\frac{3}{4}$

$\frac{38}{5} \times \frac{9}{2} - k = \frac{107}{4}$

$\frac{171}{5} - k = \frac{107}{4}$

$\Rightarrow \frac{171}{5} - \frac{107}{4} = k$

$\frac{684-535}{20} = k \Rightarrow \frac{149}{20} = k \Rightarrow k = 7\frac{9}{20}$

Sol.319.(c) $\frac{7+3\sqrt{5}}{3+\sqrt{5}} + \frac{7-3\sqrt{5}}{3-\sqrt{5}}$

$\frac{21-7\sqrt{5}+9\sqrt{5}-15+21+7\sqrt{5}-9\sqrt{5}-15}{(3+\sqrt{5})(3-\sqrt{5})}$

$= \frac{12}{4} = 3$

Sol.320.(a)

$\sqrt[6]{4096} + \sqrt[4]{4096} + \sqrt[3]{4096} + \sqrt{4096}$

$= 4 + 8 + 16 + 64 \Rightarrow 92$

Sol.321.(c)

(a) $\frac{8}{9} = 0.89$, (b) $\frac{17}{20} = 0.85$

(c) $\frac{37}{40} = 0.925$, (d) $\frac{22}{25} = 0.88$

So, option (c) is the greatest.

Sol.322.(d) $\frac{2.91^2 - 1.09^2}{1.82}$

$= \frac{(2.91+1.09)(2.91-1.09)}{1.82} = 4$

Sol.323.(d)

$65 - [40 - (60 \div 5 - (18 - 24 \div 4) \div 6)]$

$= 65 - [40 - (12 - 12 \div 6)]$

$= 65 - [40 - 10] \Rightarrow 65 - 30 = 35$

Sol.324.(d) $0.\overline{12} - 0.\overline{6} + 0.\overline{3}$

$= \frac{12}{99} - \frac{6}{9} + \frac{3}{9} = \frac{-7}{33}$

Sol.325.(d) $\frac{4^{524} - 4^{522} + 30}{4^{522} + 2}$

$= \frac{4^{522}(4^2 - 1 + \frac{30}{4^{522}})}{4^{522}(1 + \frac{2}{4^{522}})} = 15$

[4^{522} is a large value when divided by small number gives 0]

Sol.326.(c)

$\frac{0.4 \times 0.4 \times 0.4 + 0.05 \times 0.05 \times 0.05}{0.8 \times 0.8 \times 0.8 + 0.1 \times 0.1 \times 0.1}$

$= \frac{(0.4+0.05)(0.4^2 - 0.4 \times 0.05 + 0.05^2)}{(0.8+0.1)(0.8^2 - 0.8 \times 0.1 + 0.1^2)}$

$= \frac{0.45 \times 0.1425}{0.9 \times 0.57}$

$= 0.5 \times 0.25 = 0.125 = \frac{1}{8}$

Sol.327.(b) $\sqrt[3]{16384} \div \sqrt[3]{256}$

$= 16\sqrt[3]{4} \div 4\sqrt[3]{4} = 4$

Sol.328.(b) 0.002 + 5.025 - 35.08 - 5.058

= 5.027 - 40.138 = - 35.111

Sol.329.(b)

$\frac{3}{4}$ of $2\frac{2}{3} \div \frac{5}{9}$ of $1\frac{1}{5} - \frac{3}{5}$ of $(\frac{2}{3} \div \frac{2}{3}$ of $\frac{3}{2}) + \frac{4}{5} \times 1\frac{1}{9} \div \frac{8}{15} - \frac{2}{3}$

$= \frac{3}{4}$ of $\frac{8}{3} \div \frac{5}{9}$ of $\frac{6}{5} - \frac{2}{5} + \frac{4}{5} \times \frac{10}{9} \times \frac{15}{8} - \frac{2}{3} = 2 \times \frac{3}{2} - \frac{2}{5} + \frac{5}{3} - \frac{2}{3}$

$= 3 - \frac{2}{5} + 1 \Rightarrow 4 - \frac{2}{5} = \frac{20-2}{5}$

$\Rightarrow \frac{18}{5} = 3\frac{3}{5}$

Sol.330.(b)

$43\frac{2}{3} \div [35 + \frac{3}{4}$ of $24 + (42 \div 7 - 5\frac{1}{3})]$

$= \frac{131}{3} \div [35 + \frac{3}{4}$ of $24 + \frac{2}{3}]$

$= \frac{131}{3} \div [35 + 18 + \frac{2}{3}]$

$= \frac{131}{3} \div \frac{161}{3} \Rightarrow \frac{131}{161}$

Sol.331.(a) $\sqrt{12.5 \times 8 \times 1.44}$

$= \sqrt{100 \times 1.44} \Rightarrow \sqrt{144} = 12$

Sol.332.(d) $\{a^3 + b^3 + c^3 - 3abc$

$= (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)\}$

$= \frac{15^3 + 20^3 + 25^3 - 22500}{15^2 + 20^2 + 25^2 - 300 - 500 - 375}$

$\frac{(15+20+25)(225+400+625-300-500-375)}{225+400+625-300-500-375}$

$= 60$

Sol.333.(d)

$\Rightarrow \frac{10 - [\frac{3}{4} + \{4\frac{1}{2} - (\frac{1}{4} + \frac{1}{84})\}]}{4}$

$= \frac{10 - [\frac{3}{4} + \{\frac{9}{2} - \frac{11}{42}\}]}{4}$

$= \frac{10 - [\frac{3}{4} + \frac{89}{21}]}{4} \Rightarrow \frac{10 - \frac{419}{84}}{4}$

$= \frac{421}{84 \times 4} \Rightarrow \frac{421}{336} = 1\frac{85}{336}$

Sol.334.(b)

k% of 280=50% of 350

$\frac{k}{100} \times 280 = \frac{50}{100} \times 350$

$\Rightarrow k = \frac{50 \times 350}{280} = 62.5$

Sol.335.(d) $\frac{7}{9}, \frac{6}{7}, \frac{22}{25}, \frac{11}{13}$

$\Rightarrow 0.777, 0.8571, 0.88, 0.846$

0.88 is the largest,i.e. $\frac{22}{25}$

Sol.336.(b)

$\frac{\frac{17}{2} \div \frac{15}{2} \times \frac{13}{2}}{\frac{17}{2} \div (\frac{15}{2} \times \frac{13}{2})} \div \frac{169}{30}$

$= \frac{\frac{17}{15} \times \frac{13}{2}}{\frac{34}{195}} \div \frac{169}{30}$

$= \frac{169}{4} \times \frac{30}{169} \Rightarrow \frac{30}{4} = 7\frac{1}{2}$

Sol.337.(d) 24.99% of 799.897 + 29.989% of 120.010 = 190 + 22.998% of ?

25% of $800 + 30\%$ of $120 = 190 + 23\%$ of $? \Rightarrow 200 + 36 = 190 + 23\%$ of x

$\Rightarrow 23\%$ of $x = 236 - 190$

$\Rightarrow \frac{23x}{100} = 46 \Rightarrow x = \frac{46 \times 100}{23} = 200$

Sol.338.(b)

$\frac{(34.2 \times 6.84) \div (102.6 \times 0.00171)}{(12.5 \times 0.8) \div 0.03}$

$= \frac{233.98 \div 0.175446}{10 \div 0.03} = \frac{1333.629}{333.33} = 4$

Sol.339.(b)

$\frac{32}{46} \times \frac{94}{576} \times \frac{184}{282} = \frac{2}{27}$

Sol.340.(b)

$1\frac{1}{4} \times (5\frac{3}{4} \div \frac{2}{7}$ of $k) \div 2\frac{7}{8} - 3\frac{3}{4} = (17 - 4) \div 2$ of 2

$\Rightarrow \frac{5}{4} \times (\frac{23}{4} \div \frac{2}{7}$ of $k) \div \frac{23}{8} - \frac{15}{4} = 13 \div 4 \Rightarrow \frac{5}{4} \times \frac{7}{k} - \frac{15}{4} = \frac{13}{4}$

$\Rightarrow \frac{35}{4k} - \frac{15}{4} = \frac{13}{4} \Rightarrow 35 - 15k = 13k$

$\Rightarrow 28k = 35 \Rightarrow k = \frac{35}{28} = \frac{5}{4}$

Now, $\frac{k+1}{k-1} = 9$

Sol.341.(a) $\frac{1}{1+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} + \ldots\ldots\ldots + \frac{1}{\sqrt{15}+\sqrt{16}}$

After rationalizing each term,

$\sqrt{2} - 1 + \sqrt{3} - \sqrt{2} + \sqrt{4} - \sqrt{3} + \sqrt{5} - \sqrt{4} + \sqrt{6} - \sqrt{5} \ldots\ldots\ldots + \sqrt{16} - \sqrt{15}$

$= -1 + \sqrt{16} = 4 - 1 = 3$

Sol.342.(c)

$2\frac{1}{6} \times \{1\frac{19}{26} + \frac{15}{13} \times (\frac{5}{7} \div \frac{25}{14})\}$

$= \frac{13}{6} \times \{\frac{45}{26} + \frac{15}{13} \times \frac{2}{5}\}$

$= \frac{13}{6} \times \{\frac{45}{26} + \frac{6}{13}\} = \frac{13}{6} \times \frac{57}{26} = 4\frac{3}{4}$

Sol.343.(b) 43240 - 30608 = p × 160

$12632 = 160p \Rightarrow p = \frac{12632}{160} = 78.95$

Sol.344.(a)

484.71 + 285.33 - 827.38 + 73.9

= 843.94 - 827.38 ⇒ 16.56

Sol.345.(b)

$5\sqrt{12} + 6\sqrt{27} - 4\sqrt{75} + \sqrt{192}$

$= 10\sqrt{3} + 18\sqrt{3} - 20\sqrt{3} + 8\sqrt{3} = 16\sqrt{3}$

Sol.346.(b)

$\frac{9}{15} \times \frac{45}{81} \{\frac{49}{6} \times (\frac{16}{7} - 2) \times \frac{24}{5} \times \frac{15}{16}\}$

$= \frac{9}{15} \times \frac{45}{81} \{\frac{49}{6} \times (\frac{2}{7} \times \frac{24}{5} \times \frac{15}{16}\}$

$= \frac{9}{15} \times \frac{45}{81} \times \frac{21}{2} \Rightarrow \frac{7}{2} = 3.5$

Sol.347.(b) ab ÷ c ⇒ $\frac{17}{99} \times \frac{13}{47} \div \frac{34}{33}$

$= \frac{17}{99} \times \frac{13}{47} \times \frac{33}{34} = \frac{13}{282}$

Sol.348.(b) $\frac{5}{6} \times \frac{3}{7} + y = \frac{29}{63}$

$\Rightarrow y = \frac{29}{63} - \frac{5}{14} = \frac{13}{126}$

$10y - 1 = \frac{130}{126} - 1 = \frac{4}{126}$ or $\frac{2}{63}$

Sol.349.(c) $7\frac{2}{3} \times 5\frac{3}{4} + 9\frac{1}{2} \times 6\frac{3}{4}$

$= \frac{23}{3} \times \frac{23}{4} + \frac{19}{2} \times \frac{27}{4}$

$\Rightarrow \frac{529}{12} + \frac{513}{8} = 108\frac{5}{24}$

Sol.350.(a)

$[1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{5}}}] \div 1\frac{6}{11} = \frac{x}{2}$

$[1 + \frac{1}{1 + \frac{5}{6}}] \div \frac{17}{11} = \frac{x}{2}$

$[1 + \frac{6}{11}] \div \frac{17}{11} = \frac{x}{2}$

$\frac{17}{11} \div \frac{17}{11} = \frac{x}{2} \Rightarrow x = 2$

Sol.351.(d)

$\frac{6}{5}$ of $(\frac{1}{3} + \frac{2}{4}) - \frac{5}{6}$ of $(\frac{3}{10} + \frac{12}{20}) - \frac{1}{6}$

$= \frac{6}{5} \times \frac{10}{12} - \frac{5}{6} \times \frac{18}{20} - \frac{1}{6}$

$= 1 - \frac{3}{4} - \frac{1}{6} = \frac{1}{12}$

Sol.352.(a) $5\frac{2}{3}$ + 0.73 - 3.123

$= (5 + 0.73 - 3.123) + \frac{2}{3}$

$= 2.607 + \frac{2}{3} = 3.27$

Sol.353.(d) $\frac{\sqrt{54} \times \sqrt{125}}{\sqrt{24} \times \sqrt{45}} = \frac{3\sqrt{6} \times 5\sqrt{5}}{2\sqrt{6} \times 3\sqrt{5}}$

$= \frac{5}{2} = 2.5$

Sol.354.(d) As P = 0.3 × 0.3 + 0.03 × 0.03 - 0.6 × 0.03 = $(0.3 - 0.03)^2 = 0.27^2$

Again Q = 0.54,

Then $\frac{P}{Q} = \frac{0.27^2}{0.54} = \frac{27}{200} = 0.135$

Sol.355.(d)

$\frac{1}{2} \times \frac{2}{3} - \frac{3}{4} (\frac{1}{2} \times \frac{1}{3} + \frac{5}{6}) \times \frac{4}{21}$

$= \frac{1}{3} - \frac{3}{4} \times 1 \times \frac{4}{21} = \frac{1}{3} - \frac{1}{7} \Rightarrow \frac{4}{21}$

Sol.356.(b) $\frac{\sqrt{19 - x\sqrt{12}}}{1} = \sqrt{4} - \sqrt{3}$

Squaring both sides we get,

$\Rightarrow 19 - x\sqrt{12} = 7 - 2\sqrt{12}$

$\Rightarrow x\sqrt{12} = 12 + 2\sqrt{12} \Rightarrow x = 2 + 2\sqrt{3}$

Sol.357.(d) $\sqrt{2} + \sqrt{x} = \sqrt{3} \Rightarrow \sqrt{x} - \sqrt{3} - \sqrt{2}$

Squaring both sides we get,

$\Rightarrow x = 5 - 2\sqrt{6}$

Sol.358.(b)

$\sqrt{46.24} + \sqrt{0.4624} + \sqrt{0.004624}$

= 6.8 + 0.68 + 0.068 = 7.548

Sol.359.(d)

$62 \div 5 - (\frac{8}{9} \times \frac{18}{7}) \times \frac{7}{5} + \frac{5}{4} \times \frac{16}{25}$

$= \frac{62}{5} - \frac{16}{7} \times \frac{7}{5} + \frac{4}{5} = \frac{66 - 16}{5} = 10$

Sol.360.(c) $\sqrt{150} - \sqrt{54} - \sqrt{24}$

$= 5\sqrt{6} - 3\sqrt{6} - 2\sqrt{6} = 0$

Sol.361.(a) $\sqrt{72 \times 18} + \sqrt{0.04} + \sqrt{0.64}$

$= \sqrt{9 \times 9 \times 4 \times 4} + \sqrt{\frac{4}{100}} + \sqrt{\frac{64}{100}}$

$= 9 \times 4 + \frac{2}{10} + \frac{8}{10} = 36 + 1 = 37$

Sol.362.(b) $\frac{11}{5} - (\frac{2}{3}$ of $\frac{3}{5} - \frac{1}{5}) + (\frac{6}{5} \div \frac{4}{5})$

$= \frac{11}{5} - (\frac{2}{5} - \frac{1}{5}) + (\frac{6}{5} \times \frac{5}{4})$

$= \frac{11}{5} - \frac{1}{5} + \frac{3}{2} = \frac{35}{10} = \frac{7}{2}$

Sol.363.(c) The value of $\frac{1}{0.24}$ of 1.44

$= \frac{144}{24} = 6$

Sol.364.(b) 6202.5 + 620.25 + 62.025 + 6.2025 + 0.62025

= 6202.50000 + 620.25000 + 62.02500 + 6.20250 + 0.62025 = 6891.59775

Sol.365.(a)

$\frac{(5 - \frac{42}{14} + 65) + \{\frac{(2 + 63)}{13}\} \times [(72 - 19)] + (19 - 195)}{369}$

$= \frac{(5 - 3 + 65) + 5 \times 53 - 176}{369}$

$= \frac{67 + 5 \times 53 - 176}{369} = \frac{332 - 176}{369} = \frac{156}{369}$

Sol.366.(c) $\sqrt{\frac{36.1}{102.4}} = \sqrt{\frac{361}{1024}} = \frac{19}{32}$

Sol.367.(c) $\frac{25 + 3of\ 8 - 4}{27 - 3of\ (8 - 4)}$

$= \frac{25 + 24 - 4}{27 - 3of4} = \frac{45}{15} = 3$

Sol.368.(d) $\sqrt{3^n} = 729$

Squaring both sides,

$3^n = (729)^2 \Rightarrow 3^n = (3^6)^2 \Rightarrow 3^n = 3^{12}$

On comparing both sides, we get n = 12

Sol.369.(d)

Total number of students = 48

Present = $\frac{3}{8}$

$\therefore \frac{3}{8}$ of 48 = $\frac{3}{8} \times 48 = 18$

Absent = 48 - 18 = 30.

Sol.370.(d) formula used:

$a^2 - b^2$ = (a + b)(a - b) = $\frac{(0.27)^2 - (0.13)^2}{0.27 + 0.13}$

$= \frac{(0.27 + 0.13)(0.27 - 0.13)}{0.27 + 0.13} = 0.14$

Sol.371.(a) $25 \div 10 - \{\frac{7}{4} \times \frac{1}{3}\} \times \frac{6}{5}$

$+ \frac{14}{3} \times \frac{9}{10} - \{\frac{1}{5} \div \frac{1}{25}\}$

$\Rightarrow 25 \div 10 - \frac{7}{12} \times \frac{6}{5} + \frac{21}{5} - 5$

$\Rightarrow \frac{25}{10} - \frac{7}{10} + \frac{21}{5} - 5 \Rightarrow \frac{67}{10} - \frac{7}{10} - 5$

$\Rightarrow 6 - 5 = 1$

Sol.372.(d) $1 \div \{\frac{1}{2} + \frac{1}{3} + \frac{1}{6} \div (\frac{3}{4} - \frac{1}{3})\} = 1 \div \{\frac{5}{6} + \frac{1}{6} \div \frac{5}{12}\}$

$= 1 \div \{\frac{5}{6} + \frac{2}{5}\} = 1 \div \frac{37}{30} = \frac{30}{37}$

Sol.373.(b) $\sqrt{\frac{36.1}{102.4}} = \sqrt{\frac{361}{1024}} = \frac{19}{32}$

Sol.374.(c) $0.4 + \frac{404}{1000}$

= 0.4 + 0.404 = 0.804

Sol.375.(c) $[\{(2)^2\}^2]^2 = 2^8$

Sol.376.(d) $0.\overline{23} + 0.\overline{22}$

$= 0.\overline{45}$ = 0.454545.....

Sol.377.(b) Let the fraction is $\frac{x}{y}$,

The denominator of the fraction is 2 more than the numerator ⇒ $y = x + 2$

When the numerator is multiplied by 3 and the denominator is multiplied by 2, the fraction becomes $\frac{1}{2}$,

$\Rightarrow \frac{3x}{2\times(x+2)} = \frac{1}{2} \Rightarrow x = 1$

So, the given fraction is $\frac{x}{y} = \frac{1}{3}$

Sol.378.(c) $2.2 \times 0.2 \div (0.4 \times \frac{1}{2}) - \frac{1}{2} \times 4$ (1.04 - 0.2 × 0.2)

$\Rightarrow 2.2 \times \frac{0.2}{0.2} - \frac{1}{2} \times 4$ (1.04 - 0.04)

$= 2.2 - \frac{1}{2} \times 4 \times 1 = 2.2 - 2 = 0.2$

Sol.379.(c)

$12 + 8 - 5 \times \frac{1}{2} \times 12 - \{45 \div (34 - 19)\} = ?$

$= 12 + 8 - 5 \times \frac{1}{2} \times 12 - (45 \div 15)$

$= 12 + 8 - 30 - 3 = 20 - 33 = -13$

Sol.380.(c) Ascending order = $\frac{1}{3}, \frac{2}{5}, \frac{4}{7}$

Sol.381.(a)

$(4\frac{3}{4} - 3\frac{1}{3}) \div \frac{3}{4} - \frac{3}{5}) + \frac{3}{5} \times \frac{5}{7} \times \frac{7}{9}$

$= \frac{17}{12} \div \frac{3}{20} + \frac{1}{3} = \frac{17}{12} \times \frac{20}{3} + \frac{1}{3}$

$= \frac{85}{9} + \frac{1}{3} = \frac{88}{9} = 9\frac{7}{9}$

Sol.382.(b) $\sqrt{8 - 2\sqrt{15}}$

$= \sqrt{(\sqrt{5})^2 + (\sqrt{3})^2 - 2\sqrt{5}\sqrt{3}}$

$= \sqrt{(\sqrt{5} - \sqrt{3})^2} = \sqrt{5} - \sqrt{3}$

Sol.383.(d) $1.8 + 2 \times \frac{3}{2} \times \frac{1}{2} \{\frac{2}{5} \div (\frac{3}{5} \times \frac{2}{3}) \times \frac{3}{2} - 1\}$

$= 1.8 + 2 \times \frac{3}{2} \times \frac{1}{2} \{\frac{2}{5} \div \frac{2}{5} \times \frac{3}{2} - 1\}$

$= 1.8 + 2 \times \frac{3}{2} \times \frac{1}{2} (\frac{3}{2} - 1)$

$= 1.8 + 2 \times \frac{3}{2} \times \frac{1}{2} \times \frac{1}{2} = 1.8 + \frac{3}{4}$

= 1.8 + 0.75 = 2.55

Sol.384.(a)

5 minutes of an hour = $\frac{5}{60} = \frac{1}{12}$

20 seconds of an hour = $\frac{20}{3600} = \frac{1}{180}$

Difference = $\frac{1}{12} - \frac{1}{180}$

$= \frac{15-1}{180} = \frac{14}{180} = \frac{7}{90} = \frac{0.7}{9}$

Sol.385.(a) $(2.697 + 0.498)^2 - (2.697 - 0.498)^2 = (2.7 + 0.5)^2 - (2.7 - 0.5)^2$

$= (3.2)^2 - (2.2)^2 = (3.2 + 2.2)(3.2 - 2.2)$

$= 5.4 \times 1 = 5.4$

Sol.386.(b)

$$\frac{6.25 + \frac{5}{7} \times 28 - 5}{\frac{3}{4} \times (15.8 - 3.4) + 5 \times 2.39}$$

$$= \frac{6.25 + 15}{\frac{3}{4} \times 12.4 + 5 \times 2.39}$$

$$= \frac{21.25}{9.3 + 11.95} = \frac{21.25}{21.25} = 1$$

Sol.387.(a)

$\sqrt{37 + \sqrt{130 + 2\sqrt{56 - \sqrt{16} - \sqrt{9}}}}$

$= \sqrt{37 + \sqrt{130 + 2 \times 7}} = \sqrt{37 + 12} = 7$

Sol.388.(d)

3.03 + 31.003 + 13.33 + 3.331

= 3.030 + 31.003 + 13.330 + 3.331

= 50.694

Sol.389.(d) $\{1 - \frac{1}{4}\}\{1 - \frac{2}{4}\} \ldots \{1 - \frac{5}{4}\}\{1 - \frac{6}{4}\}$

In the above series there will be term $(1 - \frac{4}{4})$ in the middle which is = 0,

So, $\{1 - \frac{1}{4}\}\{1 - \frac{2}{4}\} \ldots \{1 - \frac{5}{4}\}\{1 - \frac{6}{4}\} = 0$

Sol.390.(c)

$\sqrt{56 + \sqrt{185 + 88\sqrt{36} + 19}}$

$= \sqrt{56 + \sqrt{185 + 88\sqrt{25}}}$

$= \sqrt{56 + \sqrt{185 + 88 \times 5}}$

$= \sqrt{56 + \sqrt{185 + 440}} = \sqrt{56 + \sqrt{625}}$

$= \sqrt{56 + 25} = \sqrt{81} = 9$

Sol.391.(b) $1800 \div 10 \times \{45 \div 17 - 2\}$

$\{45 \div (17 - 2)\} \times 2 + \{-2(1 + 2)\}$

$= 1800 \div 10 \times 3 \times 2 - 6$

$= 180 \times 6 - 6 = 1080 - 6 = 1074$

Sol.392.(c) 8.8 + .08 + 8.88 + .808

= 8.800 + 0.080 + 8.880 + 0.808 = 18.568

Sol.393.(c) $0.3 \div (0.6 \times \frac{2}{3}) \times 0.2$ (0.2 × 2 ÷ $\frac{1}{2}$ + 0.2)

$= 0.3 \div 0.4 \times 0.2 \times (0.4 \div 0.5 + 0.2)$

$= 0.75 \times 0.2 \times 1 = 0.15$

Sol.394.(a) $\frac{1}{1.2.3} + \frac{1}{3.4.5} + \frac{1}{4.5.6}$

$= \frac{1}{6} + \frac{1}{24} + \frac{1}{60} + \frac{1}{120}$

$= \frac{20 + 5 + 2 + 1}{120} = \frac{28}{120} = \frac{7}{30}$

Sol.395.(a) $\frac{1}{4} + \frac{1}{4 \times 5} + \frac{1}{4 \times 5 \times 6}$

$= \frac{1}{4}(1 + \frac{1}{5} + \frac{1}{30}) = \frac{1}{4}(\frac{30 + 6 + 1}{30})$

$= \frac{37}{120} = 0.308 = 0.31$

Sol.396.(a) 1.1 + 1.001 + 10.01 + 11.11

= 23.221

Sol.397.(b) $0.0\overline{37} = \frac{37}{990}$

Sol.398.(d)

$(1 - \frac{1}{2})(1 - \frac{1}{3}) \ldots (1 - \frac{1}{9})(1 - \frac{1}{10})$

$= \frac{1}{2} \times \frac{2}{3} \times \ldots\ldots \times \frac{8}{9} \times \frac{9}{10} = \frac{1}{10}$

Sol.399.(b)

$394 \times 394 + 2 \times 394 \times 106 + 106 \times 106$

$= (394 + 106)^2 = (500)^2 = 250000$

Sol.400.(a) $19\frac{2}{3} - 7\frac{1}{4} = x + 2\frac{1}{2}$

$\Rightarrow \frac{59}{3} - \frac{29}{4} = x + \frac{5}{2} \Rightarrow x = \frac{59}{3} - \frac{29}{4} - \frac{5}{2}$

$= \frac{236 - 87 - 30}{12} = \frac{119}{12} = 9\frac{11}{12}$

Sol.401.(b) $(-20)^3 + (13)^3 + (7)^3$

= - 8000 + 2197 + 343 = - 5460

Sol.402.(c) $\sqrt{45} + \sqrt{125} = 17.89$

$\Rightarrow 3\sqrt{5} + 5\sqrt{5} = 17.89 \Rightarrow 8\sqrt{5} = 17.89$

$= \sqrt{5} = \frac{17.89}{8}$

Now, $\sqrt{180} + \sqrt{80} = 6\sqrt{5} + 4\sqrt{5}$

$= 10\sqrt{5} = 10 \times \frac{17.89}{8} = 22.36$

= 22.4 (Approx)

Sol.403.(c) 1.236576576. ..

$= 1.23\overline{657} = \frac{123657 - 123}{99900} = \frac{123534}{99900}$

Sol.404.(d) $16 \div 4 \times 2 - 5 + 1$

$= 4 \times 2 - 5 + 1 = 8 - 5 + 1 = 9 - 5 = 4$

And $[\{(16 \div 4) \times 2\} - 5] + 1$

$= [\{4 \times 2\} - 5] + 1 = [8 - 5] + 1 = 3 + 1 = 4$

Sol.405.(c) $\frac{4767}{11123} = \frac{3}{7}$

Sol.406.(a) $\sqrt{4} = 2 \text{ or } -2$

Sol.407.(a) $(a + b\sqrt{2})^2 = 19 + 6\sqrt{2}$

$\Rightarrow (a + b\sqrt{2})^2 = \{1^2 + (3\sqrt{2})^2 + 6\sqrt{2}\}$

$\Rightarrow (a + b\sqrt{2})^2 = (1 + 3\sqrt{2})^2$

On comparing we observe that a = 1

Sol.408.(d)

$$\frac{0.868 \times 0.237 + 0.868 \times 0.763}{0.7 \times 0.936 + 0.7 \times 0.064}$$

$$= \frac{0.868(0.237 + 0.763)}{0.7(0.936 + 0.064)} = \frac{0.868}{0.7} = 1.24$$

Sol.409.(a)

$(\frac{\sqrt{3} - 1}{\sqrt{3} + 1} + \frac{\sqrt{3} + 1}{\sqrt{3} - 1} + \frac{2 - \sqrt{3}}{2 + \sqrt{3}} + \frac{2 + \sqrt{3}}{2 - \sqrt{3}})$

$= \frac{(\sqrt{3}-1)^2 + (\sqrt{3}+1)^2}{3-1}$

$+ \frac{(2-\sqrt{3})^2 + (2+\sqrt{3})^2}{4-3}$

$= \frac{2\{(\sqrt{3})^2 + (1)^2\}}{2} + \frac{2(4+3)}{1}$

= 4 + 14 = 18

Sol.410.(b)

0.3333 x 0.25 x 0.499 x 0.125 x 24

$= \frac{1}{3} \times \frac{1}{4} \times \frac{1}{2} \times \frac{1}{8} \times 24 = \frac{1}{8}$

Sol.411.(b) a : b = $\sqrt{7}$.: $\sqrt{3}$

= (3a + 2b) : (3a - 2b)

= $(3\sqrt{7} + 2\sqrt{3})$: $(3\sqrt{7} - 2\sqrt{3})$

$= \frac{(3\sqrt{7}+2\sqrt{3})}{(3\sqrt{7}-2\sqrt{3})} \times \frac{(3\sqrt{7}+2\sqrt{3})}{(3\sqrt{7}+2\sqrt{3})}$

$= \frac{75 + 12\sqrt{21}}{51} = \frac{25 + 4\sqrt{21}}{17}$

$= \frac{(2+\sqrt{21})^2}{17} \frac{(\sqrt{21}+2)^2}{17}$

$= \frac{(\sqrt{21}+2)^2}{(\sqrt{21}+2)(\sqrt{21}-2)} = \frac{2+\sqrt{21}}{(-2+\sqrt{21})}$

Sol.412.(c) $8 + (\frac{1}{2} + \frac{1}{4}) \times 16$

$= 8 + (\frac{3}{4}) \times 16 = 8 + 12 = 20$

Sol.413.(b) $\sqrt{45} + \sqrt{125} = 17.88$

$\Rightarrow 3\sqrt{5} + 5\sqrt{5} = 17.88 \Rightarrow 8\sqrt{5} = 17.88$

$\Rightarrow \sqrt{5} = \frac{17.88}{8} = 2.235$

Now, $\sqrt{180} + \sqrt{80} = 6\sqrt{5} + 4\sqrt{5} = 10\sqrt{5} = 10 \times 2.235 = 22.35$

Sol.414.(d) $x + \frac{18}{24} + 3\frac{3}{4} = 23\frac{13}{24}$

$\Rightarrow x = 23\frac{13}{24} - \frac{18}{24} - 3\frac{3}{4}$

$= 23\frac{13}{24} - 4\frac{1}{2} = 19\frac{1}{24}$

Sol.415.(a) 987× 999 =987 × (1000 - 1)

= 987 × 1000 − 987

= 987000 - 987 = 986013

Sol.416.(a)

(1 + 2 + x) - (0.12 - 0.42 + 0.94) = 4

⇒ (3 + x) - (0.64) = 4 ⇒ 3 + x = 4.64

⇒ x = 4.64 - 3 = 1.64

Sol.417.(b) $? + \frac{18}{24} + 3\frac{3}{4} = 23\frac{13}{24}$

$\Rightarrow x + \frac{3}{4} + 3\frac{3}{4} = 23\frac{13}{24}$

$\Rightarrow x = 23\frac{13}{24} - 4\frac{1}{2} = 19(\frac{13}{24} - \frac{1}{2})$

$= 19\frac{1}{24}$

Sol.418.(b) $(1^3 + 2^3 + 3^3 + \ldots + 8^3)^{\frac{-5}{2}}$

$= [(\frac{8 \times 9}{2})^2]^{\frac{-5}{2}} = [(36)^2]^{\frac{-5}{2}}$

$= [(6)^4]^{\frac{-5}{2}} = 6^{-10}$

Sol.419.(d) 11 + 11 ÷ 11 + 11 x 11 -11

= 11 + 1 + 121 - 11 = 133 - 11 = 122

Sol.420.(c) $(625)^{0.17} \times (625)^{0.08}$

$= (625)^{0.17+0.08} = (625)^{0.25}$

$= (625)^{\frac{1}{4}} = [(5)^4]^{\frac{1}{4}} = 5$

Sol.421.(c) $\frac{9^m \times 3^5 \times 27^3}{3 \times 81^4} = 3^9$

$\Rightarrow \frac{3^{2m} \times 3^5 \times 3^9}{3 \times 3^{16}} = 3^9$

$\Rightarrow \frac{3^{14+2m}}{3^{17}} = 3^9 \Rightarrow 3^{14+2m} = 3^{26}$

On comparing we get,

14 + 2m = 26 ⇒ 2m = 12 ⇒ m = 6

Sol.422.(a)

The given ratios → 5 : 3, 7 : 5, 6 : 4

$= \frac{5}{3}, \frac{7}{5}, \frac{6}{4} = \frac{5}{3}, \frac{7}{5}, \frac{3}{2}$

Now to compare among them we need to equalize the denominators :

$\Rightarrow \frac{50}{30}, \frac{42}{30}, \frac{45}{30}$

So,The descending order will be :

$\frac{5}{3} > \frac{6}{4} > \frac{7}{5}$

Sol.423.(a) $\frac{3x}{2y} = \frac{48}{72}$

$\Rightarrow \frac{x}{y} = \frac{16}{36} = \frac{4}{9}$

Then $\frac{x}{y}$ in its lowest term is = $\frac{4}{9}$

Sol.424.(b) $(\frac{32}{5}) \times 92 + (\frac{3}{5}) \times 2$

$= 2 \times (\frac{92 \times 16 + 3}{5}) = 2 \times 295 = 590$

Sol.425.(b)

$\frac{\sqrt{7}-\sqrt{3}}{\sqrt{7}+\sqrt{3}} + \frac{\sqrt{7}+\sqrt{3}}{\sqrt{7}-\sqrt{3}} + \frac{\sqrt{3}+1}{\sqrt{3}-1}$

$+ \frac{\sqrt{3}-1}{\sqrt{3}+1} = \frac{2(7+3)}{(7-3)} + \frac{2(3+1)}{(3-1)}$

= 5 + 4 = 9

Sol.426.(c)

$\frac{(2.7)^2 - (0.8)^2}{2.7 - 0.8} = 2.7 + 0.8 = 3.5$

Sol.427.(d)

$\frac{(x^3 - y^3)(x^2 + 5x + 6)(x^4 - 16)}{(x-y)(x+3)(x-2)(x^2+4)}$

$= \frac{(x - y)(x^2+xy+y^2)(x+3)(x+2)(x^2+4)(x^2-4)}{(x-y)(x+3)(x-2)(x^2+4)}$

$= \frac{(x^2 + xy + y^2)(x+2)(x^2-4)}{(x-2)}$

$= \frac{(x^2 + xy + y^2)(x+2)(x+2)(x-2)}{(x-2)}$

$= (x^2 + y^2 + xy)(x + 2)^2$

Sol.428.(d) $\frac{(-\frac{1}{2})^5}{(-\frac{1}{2})^4} + \frac{(-\frac{1}{8})}{(-\frac{1}{4})}$

$= \frac{(-\frac{1}{2})^5}{(-\frac{1}{2})^4} + \frac{(-\frac{1}{4}) \times \frac{1}{2}}{(-\frac{1}{4})}$

$= -\frac{1}{2} + \frac{1}{2} = 0$

Sol.429.(d) $Given, \sqrt{15} = 3.88, \sqrt{\frac{5}{3}}$ ...(i)

Multiply with $\sqrt{3}$ in numerator and denominator

$\sqrt{\frac{5 \times 3}{3 \times 3}} = \frac{\sqrt{15}}{3} = \frac{3.88}{3}$

= 1.2933333.... = $1.29\overline{3}$

Sol.430.(b) $\sqrt{2025} = 45$

Sol.431.(c) Given,

$(\sqrt{2} + \sqrt{3})(\sqrt{2} - \sqrt{3})$

Formula :- $x^2 - y^2 = (x + y)(x - y)$

$(\sqrt{2} + \sqrt{3})(\sqrt{2} - \sqrt{3}) = 2 - 3 = -1$

Sol.432.(c) $\sqrt{8} + \sqrt{18} \rightarrow 2\sqrt{2} + 3\sqrt{2} = 5\sqrt{2}$

Sol.433.(d) $(\sqrt{3} - \sqrt{2}) \times (\sqrt{3} + \sqrt{2})$

$= (\sqrt{3})^2 - (\sqrt{2})^2 = 3 - 2 = 1$

Sol.434.(a) $\frac{32 \div 4 - 5 \times 8 \div 3}{5 \times 3 - \{6 + 3\}}$

$= \frac{8 - 5 \times \frac{8}{3}}{15 - 9} = \frac{24 - 40}{3 \times 6} = -\frac{16}{18} = -\frac{8}{9}$

Sol.435.(b) $\sqrt{\frac{1.21 \times 0.9}{1.1 \times 0.11}}$

$= \sqrt{\frac{121 \times 9 \times 1000}{11 \times 11 \times 1000}} = \sqrt{9} = 3$

Sol.436.(a) $\frac{\{(13)^3 - 4^3\}}{13 - 8 \div 2} \div 8 - 2 + 6 \times 9$

$= \frac{2197 - 64}{9} \div 8 - 56$

$= \frac{2133}{9} \div 8 - 56 = 237 \div 8 - 56$

$= \frac{237}{8} - 56 = \frac{237 - 448}{8} = -\frac{211}{8}$

Sol.437.(b)

$\frac{81}{7} \times \frac{21}{3} - 4\frac{2}{3} \div \frac{7}{9} \times \frac{121}{6}$

$= 81 - \frac{14}{3} \times \frac{9}{7} \times \frac{121}{6}$

= 81 - 121 = - 40

Sol.438.(d)=

$\sqrt{(1+3+5)(1+3+5+7)(1+3+5+7+9)}$

$= \sqrt{9 \times 16 \times 25} = \sqrt{3600} = 60$

Sol.439.(a) $7\frac{8}{9} = \frac{71}{9}$

If Numerator = 70 + x = 71

Hence , x = 1

Sol.440.(c)

We know that , 1000 gm = 1 kg

200 g as a fraction of 1 kg = $\frac{200}{1000} = \frac{1}{5}$

Sol.441.(a) $0.\overline{23} + 0.\overline{22} = 0.\overline{45}$

Sol.442.(a) $= \sqrt{2 - \sqrt{3}}$

$= \sqrt{\frac{2 \times (2 - \sqrt{3})}{2}} = \sqrt{\frac{4 - 2\sqrt{3})}{2}}$

$= \frac{\sqrt{3} - 1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{6} - \sqrt{2}}{2}$

Sol.443.(b) $25.12 \times 37.5 = 942$

A/Q

$2512 \times 0.00375 = 9.42$

Sol.444.(a) $= 3 \div 1 - 2 + 3 = 3 + 1 = 4$

Sol.445.(a) $\frac{121}{0.121} = \frac{12.1}{x}$

$\Rightarrow 121x = 12.1 \times 0.121$

$\Rightarrow x = \frac{12.1 \times 0.121}{121} = 0.0121$

Sol.446.(a)

$\frac{289 \times 289 \times 289 + 111 \times 111 \times 111}{289 \times 289 - 289 \times 111 + 111 \times 111}$

$= \frac{(289)^3 + (111)^3}{(289)^2 - 289 \times 111 + (111)^2}$

$= \frac{(289 + 111)[(289)^2 - 289 \times 111 + (111)^2]}{(289)^2 - 289 \times 111 + (111)^2}$

$= 289 + 111 = 400$

Sol.447.(b) $\frac{(3\frac{1}{4})^4 - (4\frac{1}{3})^4}{(3\frac{1}{4})^2 - (4\frac{1}{3})^2}$

$= \frac{((3\frac{1}{4})^2)^2 - ((4\frac{1}{3})^2)^2}{(3\frac{1}{4})^2 - (4\frac{1}{3})^2}$

$= \frac{\{(3\frac{1}{4})^2 + (4\frac{1}{3})^2\}\{(3\frac{1}{4})^2 - (4\frac{1}{3})^2\}}{(3\frac{1}{4})^2 - (4\frac{1}{3})^2}$

$= (3\frac{1}{4})^2 + (4\frac{1}{3})^2 = (\frac{13}{4})^2 + (\frac{13}{3})^2$

$= (\frac{13}{4} + \frac{13}{3})^2 - 2 \times \frac{13}{4} \times \frac{13}{3}$

$= (\frac{91}{12})^2 - \frac{169}{6} = \frac{8281}{144} - \frac{169}{6}$

$= \frac{8281 - 4056}{144} = \frac{4225}{144}$

Now, $\sqrt{\frac{4225}{144}} = \frac{65}{12} = 5\frac{5}{12}$

Sol.448.(c) $\frac{3}{\sqrt{0.0009}} + \frac{4}{\sqrt{0.0016}}$

$= \frac{3 \times 100}{3} + \frac{4 \times 100}{4} = 100 + 100 = 200$

Sol.449.(c)

$\frac{225^{0.2} \times 225^{0.3}}{225^{0.6} \times 225^{0.4}} = \frac{225^{0.5}}{225^1} = \frac{15}{225} = \frac{1}{15}$

Sol.450.(a) Formula used:

$a^3 - b^3 = (a + b)(a^2 + b^2 - ab)$

$\frac{0.6 \times 0.6 \times 0.6 + 0.7 \times 0.7 \times 0.7}{0.6 \times 0.6 - 0.42 + 0.7 \times 0.7}$

$= \frac{(0.6 + 0.7)(0.36 - 0.42 + 0.49)}{0.36 - 0.42 + 0.49}$

$= \frac{1.3}{1} = 1.3$

Sol.451.(b)

$= \frac{1}{5} \div (\frac{5}{3} \times \frac{3}{25}) = \frac{1}{5} \div (\frac{15}{75})$

$= \frac{1}{5} \times \frac{75}{15} = 1$

Sol.452.(b) Let

$\sqrt{7 + \sqrt{7 + \sqrt{7 + \sqrt{7 + \ldots}}}} = X$ ------- (i)

Squaring on both sides of the above equation.

$\Rightarrow 7 + \sqrt{7 + \sqrt{7 + \sqrt{7 + \ldots}}} = X^2$

$\Rightarrow 7 + X = X^2 \Rightarrow X = X^2 - 7$

Putting the value of X in equation (i)

So that, $\sqrt{7 + \sqrt{7 + \sqrt{7 + \sqrt{7 + \ldots}}}}$

$= \frac{1 \pm \sqrt{29}}{2}$

Sol.453.(c)

64.916 + 1.456 - 25.326 = 41.046

Sol.454.(b) $25 + [20 - \{2((20 \times \frac{1}{5}) \div \frac{1}{8} \times \frac{1}{16} - 8)\}]$

$= 25 + [20 - \{2((4 \times 8) \times \frac{1}{16} - 8)\}] = 25 + [20 - \{2(\frac{32}{16} - 8)\}]$

$= 25 + [20 - \{2(2 - 8)\}] = 25 + [20 + 12]$

$= 57$

Sol.455.(c) $\frac{1}{\sqrt{2} + \sqrt{1}} + \frac{1}{\sqrt{3} + \sqrt{2}} + \frac{1}{\sqrt{4} + \sqrt{3}} + \ldots + \frac{1}{\sqrt{100} + \sqrt{99}}$

After Rationalizing

$\frac{1}{\sqrt{2} + \sqrt{1}} \times \frac{\sqrt{2} - 1}{\sqrt{2} - 1} + \frac{1}{\sqrt{3} + \sqrt{2}} \times \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} - \sqrt{2}} + \frac{1}{\sqrt{4} + \sqrt{3}} \times \frac{\sqrt{4} - \sqrt{3}}{\sqrt{4} - \sqrt{3}} + \ldots + \frac{1}{\sqrt{100} + \sqrt{99}} \times \frac{\sqrt{100} - \sqrt{99}}{\sqrt{100} - \sqrt{99}}$

$= \sqrt{2} - 1 + \sqrt{3} - \sqrt{2} + \sqrt{4} - \sqrt{3} + \ldots\ldots + \sqrt{100} - \sqrt{99} = 10 - 1 = 9$

Sol.456.(c) $(\sqrt{81} + \sqrt{0.81} + \sqrt{0.0081})\sqrt{10000} = (9 + 0.9 + 0.09) \times 100$

$= 9.99 \times 100 = 999$

Sol.457.(b) $(\frac{2}{7})^{-3} \times (\frac{2}{7})^{-5}$

$= (\frac{2}{7})^{-3m+1} \Rightarrow (\frac{2}{7})^{-8} = (\frac{2}{7})^{-3m+1}$

On comparing, we get

$\Rightarrow$ -3m + 1 = -8 $\Rightarrow$ -3m = -9 $\Rightarrow$ m = 3

Sol.458.(c)

$4\frac{1}{10} - [2\frac{1}{2} - \{\frac{5}{6} - (\frac{2}{5} + \frac{3}{10})\}]$

$\Rightarrow 4\frac{1}{10} - [\frac{5}{2} - \{\frac{5}{6} - \frac{7}{10}\}]$

$\Rightarrow 4\frac{1}{10} - [\frac{5}{2} - \frac{4}{30}] \Rightarrow 4\frac{1}{10} - \frac{71}{30} = \frac{26}{15}$

Sol.459.(a) $\frac{7}{9} \times \frac{21}{5} \times 25\,(65^2 - 55^2)$

$= \frac{7}{9} \times \frac{21}{5} \times 25 \times (4225 - 3025)$

$= [\frac{21 \times 7}{9 \times 5}] \times 25 \times 1200$

$= \frac{147}{45} \times 25 \times 1200$

$= \frac{147}{3} \times 5 \times 400 = 98000$

Sol.460.(b) $5 \times 0.5 \times 0.05 \times 0.005 \times 500$

$= 2.5 \times 0.00025 \times 500 = 0.3125$

Sol.461.(b)

$3\frac{2}{3} + 6\frac{7}{12} + 4\frac{9}{36} + 5 + 7\frac{1}{12}$

$= \frac{11}{3} + \frac{79}{12} + \frac{153}{36} + 5 + \frac{85}{12}$

$= \frac{132 + 237 + 153 + 180 + 255}{36}$

$= 26\frac{21}{36} = 26 + \frac{21}{36}$ 26 is whole number

To make $\frac{21}{36}$ a whole number, the required fraction to be added will be,

$= 1 - \frac{21}{36} = \frac{15}{36} = \frac{5}{12}$

Sol.462.(d)

(0.032 x 0.0032) + 0.00032 = 0.0004224

Sol.463.(d)

$\frac{7^{\frac{1}{5}}}{7^{\frac{1}{3}}} = 7^{\frac{1}{5} - \frac{1}{3}} = 7^{-\frac{2}{15}}$

Sol.464.(a)

$\frac{(3.17 + 9.12)^2 + (3.17 - 9.12)^2}{3.17 \times 3.17 + 9.12 \times 9.12}$

$\frac{(3.17)^2 + (9.12)^2 + 2 \times 3.17 \times 9.12 + (3.17)^2 + (9.12)^2 - 2 \times 3.17 \times 9.12}{(3.17)^2 + (9.12)^2}$

$= \frac{2[(3.17)^2 + (9.12)^2]}{(3.17)^2 + (9.12)^2} = 2$

Short Tricks:-

$\frac{(3.17 + 9.12)^2 + (3.17 - 9.12)^2}{3.17 \times 3.17 + 9.12 \times 9.12} = 2$

Using Identities :-

$\frac{(a+b)^2 + (a-b)^2}{a^2 + b^2} = \frac{2(a^2 + b^2)}{(a^2 + b^2)} = 2$

Sol.465.(b)

$3.1\overline{4} = 3 + 0.1\overline{4} = 3 + \frac{14 - 1}{90} = 3\frac{13}{90}$

Sol.466.(b)

$\frac{4}{11} \times \frac{121}{16} \times 24 \times (75^2 - 55^2) \times \frac{1}{100}$

$= \frac{11}{4} \times 24\ (5625 - 3025) \times \frac{1}{100}$

$= 11 \times 6 \times 2600 \times \frac{1}{100} = 1716$

Sol.467.(c)

$9 \times 0.9 \times 0.09 \times 0.009 \times \frac{1}{0.3} \times \frac{1}{0.03} \times \frac{1}{0.003}$

$= 9 \times \frac{9}{10} \times \frac{9}{100} \times \frac{9}{1000} \times \frac{10}{3} \times \frac{100}{3} \times \frac{1000}{3} = 243$

Sol.468.(a) $\frac{5 + 5 \times 5}{5 \times 5 + 5} \times \frac{\frac{1}{5} \div (\frac{1}{5} \times \frac{1}{5})}{(\frac{1}{5} \times \frac{1}{5}) \div \frac{1}{5}} - (5 - \frac{1}{5}) \times \frac{10}{2}$

$= \frac{30}{30} \times \frac{\frac{1}{5} \times 25}{\frac{1}{25} \times 5} - \frac{24}{5} \times 5$

$= 1 \times 25 - 24 = 1$

Sol.469.(d)

0.434343 is a non-terminating number.

When it is converted into a fraction = $\frac{43}{99}$

In 0.434343 non terminating value - 43 and its number = 2

So that, the number of 9 is equal to 2

Sol.470.(a) 176 +17.6 +1.76 + 0.176 + 0.0176 = 195.5536

Sol.471.(d)

Sum of $\frac{5}{2}$ and $\frac{2}{5} = \frac{5}{2} + \frac{2}{5} = \frac{29}{10}$

Sol.472.(b) $\sqrt{\frac{1521}{1849}} = \sqrt{\frac{39 \times 39}{43 \times 43}} = \frac{39}{43}$

Sol.473.(b) $(\frac{6+3}{3}) - 5 \times (4 + 5)$

$= \frac{9}{3} - 5 \times 9 = 3 - 45 = -42$

Sol.474.(b) $\frac{4 + \sqrt{2}}{\sqrt{2} + 1} = \frac{(4 + \sqrt{2})(\sqrt{2} - 1)}{(\sqrt{2} + 1)(\sqrt{2} - 1)}$

$= \frac{4\sqrt{2} - 4 + 2 - \sqrt{2}}{1} = 3\sqrt{2} - 2$

Sol.475.(b)

Sum = $\frac{1}{3} + \frac{4}{3} + \frac{3}{4} = \frac{4 + 16 + 9}{12} = \frac{29}{12}$

Sol.476.(b) $\sqrt{29.16} + \sqrt{0.2916}$ $+ \sqrt{0.002916} + \sqrt{0.00002916}$

= 5.4 + 0.54 + 0.054 + 0.0054 = 5.9994

Sol.477.(b) 20 - [15 - {4 - (8 - 6 + 3)}]

= 20 - [15 - {4 - 5}]

= 20 - [15 + 1] = 20 - 16 = 4

Sol.478.(b) $\frac{\sqrt{225}}{14} \times \frac{\sqrt{196}}{22} \times \frac{\sqrt{484}}{15}$

$= \frac{15}{14} \times \frac{14}{22} \times \frac{22}{15} = 1$

Sol.479.(d) $103 - [144 \div (12 \times 12) + 5 + 12 \div (6 - 2) + 10]$

=103 - [144 ÷144 + 5 + 12 ÷ 4 + 10]

= 103 - [1 + 5 + 3 + 10] = 103 - 19 = 84

Sol.480.(b) $\frac{(5.4)^3 - 0.064}{(5.4)^2 + 2.16 + 0.16}$

$= \frac{(5.4)^3 - (0.4)^3}{(5.4)^2 + 5.4 \times 0.4 + (0.4)^2}$

$= \frac{5.4 - 0.4\{(5.4)^2 + 5.4 \times 0.4 + (0.4)^2\}}{(5.4)^2 + 5.4 \times 0.4 + (0.4)^2} = 5$

Sol.481.(c) $\sqrt{10 + \sqrt{221 + \sqrt{12 + \sqrt{16}}}}$

$= \sqrt{10 + \sqrt{221 + \sqrt{12 + 4}}}$

$= \sqrt{10 + \sqrt{221 + 4}} = \sqrt{10 + 15} = 5$

Sol.482.(b)

$\sqrt{0.04} + \sqrt{1.44} + \sqrt{1.69} + \sqrt{0.0009}$

= 0.2 + 1.2 + 1.3 + 0.03 = 2.73

Sol.483.(a) $\frac{1}{36.18} = \frac{1 \times 100}{3618} = 0.0276$

similarly, $\frac{1}{0.0003618} = \frac{10000000}{3618} = 2760$

Sol.484.(a) $\frac{7}{9} - \frac{11}{12} + \frac{13}{16} - \frac{1}{8}$

$= \frac{112 - 132 + 117 - 18}{144} = \frac{79}{144}$

Sol.485.(a) $\frac{(6 \times 2)}{(8 - 1 + 5)} = \frac{12}{12} = 1$

Sol.486.(b) 0.25 ÷ 0.0025 x 0.025 x 25

$= \frac{25}{100} \times \frac{10000}{25} \times \frac{25}{1000} \times 25 = 62.5$

Sol.487.(c)

When we divide, we get quotient = 0.704

Sol.488.(d) Let the required fraction = $\frac{x}{y}$

A/Q,

$\frac{x}{y} \times \frac{27}{1} = \frac{3}{11} \times \frac{9}{5}$

$\Rightarrow \frac{27x}{y} = \frac{27}{55} \Rightarrow \frac{x}{y} = \frac{1}{55}$

Sol.489.(d) $\frac{\sqrt{5} + 1}{\sqrt{5} - 1} = \frac{(\sqrt{5} + 1)^2}{(\sqrt{5} - 1)(\sqrt{5} + 1)}$

$= \frac{5 + 1 + 2\sqrt{5}}{5 - 1} = \frac{6 + 2\sqrt{5}}{4} = \frac{3 + \sqrt{5}}{2}$

Sol.490.(c) $1999^2 - 999^2$ = (1999 + 999) (1999 - 999)= 2998 × 1000 = 2998000

Sol.491.(d) $0.5\overline{32} = \frac{532 - 5}{990} = \frac{527}{990}$

Sol.492.(d) 18 - [6 - {4 -(8 - (6 + 3))}]

= 18 - [6 - {4 + 1}] = 17

Sol.493.(b)

$\frac{0.2 \times 0.2 + 0.02 \times 0.02 - 0.4 \times 0.02}{0.36}$

$= \frac{0.04 + 0.0004 - 0.008}{0.36} = 0.09$

Sol.494.(b)

$\sqrt{16 + \sqrt{80 + \sqrt{5000 - 4999}}}$

$= \sqrt{16 + \sqrt{80 + \sqrt{1}}} = \sqrt{16 + \sqrt{81}}$

$= \sqrt{16 + 9} \Rightarrow \sqrt{25} = 5$

Sol.495.(a) $4 - \frac{5}{1 + \frac{1}{3 + \frac{1}{2 + \frac{1}{4}}}}$

$= 4 - \frac{5}{1 + \frac{1}{3 + \frac{4}{9}}} = 4 - \frac{5}{1 + \frac{9}{31}} = 4 - \frac{5}{\frac{40}{31}}$

$= 4 - \frac{155}{40} = \frac{5}{40} = \frac{1}{8}$

Sol.496.(a) $\frac{1}{1 + \frac{1}{3}} - \frac{1}{1 + \frac{1}{2}} = \frac{1}{\frac{4}{3}}$

$- \frac{1}{\frac{3}{2}} = \frac{3}{4} - \frac{2}{3} = \frac{9 - 8}{12} = \frac{1}{12}$

Sol.497.(c) $(\frac{2020}{2000})^{-2008} \times (\frac{2020}{2000})^{-2008} \times 2020 = (\frac{2000}{2020})^{-2008} \times (\frac{2020}{2000})^{-2008} \times 2020$

= 1 × 2020 = 2020

Sol.498.(b) $\frac{0.5 \times 0.5 + 0.09 - 0.15}{0.125 + 0.027}$

$= \frac{0.25 + 0.09 - 0.15}{0.152} = \frac{5}{4}$

Sol.499.(c)

$\frac{4 + 3 \times 3 - 2}{4 - 3 \times (3 - 2)} = \frac{4 + 9 - 2}{4 - 3} = 11$

Sol.500.(d) $2.\overline{43} - 3.\overline{04} + 4.\overline{44} = 3.\overline{83}$

Sol.501.(c) $\sqrt[2]{1\frac{11}{25}} = \sqrt[2]{\frac{36}{25}} = \frac{6}{5} = 1\frac{1}{5}$

Sol.502.(a)
$3.\overline{26} - 2.\overline{14} + 1.\overline{33} = 4.\overline{59} - 2.\overline{14} = 2.\overline{45}$

Sol.503.(c) $\sqrt{12321} \times \sqrt{?} = 13431$
$\Rightarrow 111 \times \sqrt{?} = 13431$
$\Rightarrow \sqrt{?} = 13431 \div 111 = 121$
$\Rightarrow ? = 121^2 = 14641$

Sol.504.(d)
$8 \div 8 \times \frac{8+8}{8 \div 8 \times 8 + 8} = 1 \times \frac{16}{1 \times 16} = 1$

Sol.505.(d) $\frac{a}{b} = 0.25 = \frac{1}{4}$
Now,
$\left(\frac{2a-b}{2a-b}\right) + \frac{2}{9} = \frac{2\times1-4}{2\times1+4} + \frac{2}{9}$
$= \frac{-2}{6} + \frac{2}{9} = \frac{-6+4}{18} = \frac{-1}{9}$

Sol.506.(b) $1 - \left(\frac{5}{6}\right)^2 = 1 - \frac{25}{36} = \frac{11}{36}$

Sol.507.(c) $19 \times 19 = 361$
Now,
$190 \times 0.0019 = 0.361$

Sol.508.(d) $\frac{52}{x} = \sqrt{\frac{169}{289}} = \frac{52}{x} = \frac{13}{17}$
$\Rightarrow x = 68$

Sol.509.(c) $x = \frac{1}{\sqrt{2}+1}$
$\Rightarrow x + 1 = \frac{1}{\sqrt{2}+1} + 1$
$= \frac{2+\sqrt{2}}{\sqrt{2}+1} = \frac{\sqrt{2}(\sqrt{2}+1)}{\sqrt{2}+1} = \sqrt{2}$

Sol.510.(b)
$3.12\overline{7} = \frac{3127-312}{900} = \frac{2815}{900} = \frac{563}{180}$

Sol.511.(a) $10y\sqrt{y^3 - y^2}$
$= 10y\sqrt{y^2(y-1)} = 10y^2\sqrt{y-1}$
Put y = 5
$= 10 \times 25\sqrt{4} = 250 \times 2 = 500$

Sol.512.(b)
Let the number subtracted = x
A/Q,
$\frac{15-x}{19-x} = \frac{3}{4} \Rightarrow 60 - 4x = 57 - 3x \Rightarrow x = 3$
Alternate method; Check by option :- '3' will satisfy the question.

Sol.513.(a)
3.33 hour = 3 hour + 0.33 × 60minutes
= 3 hour + 19.8 minutes
= 3 hour + 19 minutes + 0.8 × $60sec$
= 3 hour + 19 minutes + 48 sec

Sol.514.(c)
$a \times b = a + b + \left(\sqrt{\frac{a}{b}}\right) + \sqrt{(ab)}$
$16 \times 4 = 16 + 4 + \left(\sqrt{\frac{16}{4}} + \sqrt{16 \times 4}\right)$
$= 20 + (2 + 8) = 20 + 10 = 30$

Sol.515.(b)
$3.\overline{36} - 2.\overline{05} + 1.\overline{33} = 4.\overline{69} - 2.\overline{05} = 2.\overline{64}$

Sol.516.(d) $x^{11} = y^0 = 1$
Power of 1 is any number, its value is equal to 1 ⇒ So x = 1
Now,
$x = 2y = 1 \Rightarrow y = \frac{1}{2}$

Sol.517.(b) $\frac{7}{8} = 0.875$, $\frac{7}{10} = 0.70$,
$\frac{5}{7} = 0.71$, $\frac{3}{4} = 0.75$
$\frac{7}{10}$ is the smallest in all given options.

Sol.518.(b)
$\sqrt{x} + 10 = \sqrt{529} \Rightarrow \sqrt{x} + 10 = 23$
$\sqrt{x} = 13 \Rightarrow x = 169$

Sol.519.(a) $\frac{(74+47)^2 + (74-47)^2}{74^2 + 47^2}$
$= \frac{2\times(74^2 + 47^2)}{(74^2 + 47^2)} = 2$

Sol.520.(c) $0.\overline{56} + 0.\overline{43} + 0.\overline{89} = 1.\overline{89}$

Sol.521.(c) $\sqrt{15 \times 27 \times x} = 180$
$\Rightarrow 15 \times 27 \times x = 180 \times 180$
$\Rightarrow x = \frac{180 \times 180}{15 \times 27} = 80$

Sol.522.(b)
$\sqrt{0.03 \times 0.3 \times p} = 0.3 \times 0.03 \times \sqrt{q}$
$\Rightarrow \sqrt{0.009 \times p} = 0.009 \times \sqrt{q}$
$\Rightarrow \sqrt{0.009} \times \sqrt{p} = 0.009 \times \sqrt{q}$
Squaring both sides
$\Rightarrow 0.009 \times p = 0.009 \times 0.009 \times q$
$\Rightarrow \frac{p}{q} = 0.009$

Sol.523.(a) $\frac{0.3^4 - 0.2^4}{0.3^2 + 0.2^2}$
$= \frac{(0.3^2 + 0.2^2)(0.3^2 - 0.2^2)}{0.3^2 + 0.2^2}$
$= 0.3^2 - 0.2^2 = 0.09 - 0.04 = 0.05$

Sol.524.(d) $= \frac{1}{2\times4} + \frac{1}{4\times6} + \frac{1}{6\times8}$
$+ \ldots\ldots + \frac{1}{48\times50}$
$= \frac{1}{4}\left[\frac{1}{2} + \frac{1}{6} + \frac{1}{12} + \ldots\ldots + \frac{1}{8\times50}\right]$
$= \frac{1}{4}\left[(1 - \frac{1}{2}) + (\frac{1}{2} - \frac{1}{3}) + (\frac{1}{3} - \frac{1}{4})\right.$
$\left. + \ldots\ldots + (\frac{1}{24} - \frac{1}{25})\right]$
$= \frac{1}{4}\left[1 - \frac{1}{25}\right] = \frac{24}{100} = 0.24$

Sol.525.(c) $0.17 \div p^2 = 17$
$0.17 \times \frac{1}{P^2} = 17 \Rightarrow P = 0.1$

Sol.526.(a) $\frac{(19\times9 + 31\times10 + 32\times11)}{(233.25\times2 - 50)}$
$= \frac{171 + 310 + 352}{466.5 - 50} = \frac{833}{416.5} = 2$

Sol.527.(d) $\frac{5+2\sqrt{3}}{2-\sqrt{3}} = x + y\sqrt{3}$
$\Rightarrow \frac{(5+2\sqrt{3})(2+\sqrt{3})}{(2-\sqrt{3})(2+\sqrt{3})} = x + y\sqrt{3}$
$\Rightarrow \frac{10+6+9\sqrt{3}}{4-3} = x + y\sqrt{3}$
$\Rightarrow 16 + 9\sqrt{3} = x + y\sqrt{3}$
On comparing both sides we get,
$x = 16$ and $y = 9$

Sol.528.(b) Applying BODMAS,
$$\frac{(\frac{16}{5} - \frac{3}{5}) \div \frac{8}{5}}{\frac{8}{7} \div \{\frac{1}{7} - (\frac{1}{7} \div \frac{1}{5})\}}$$
$$= \frac{\frac{13}{5} \times \frac{5}{8}}{\frac{8}{7} \div \{\frac{1}{7} - \frac{5}{7}\}} = \frac{\frac{13}{8}}{\frac{8}{7} \times (\frac{-7}{4})}$$
$$= \frac{\frac{13}{8}}{\frac{-2}{1}} = -\frac{13}{16}$$

Sol.529.(c) $\frac{17\times17\times17 + 343}{338 - x} = 24$
$\frac{4913 + 343}{338 - x} = 24 \Rightarrow 5256 = 8112 - 24x$
$\Rightarrow x = \frac{2856}{24} = 119$

Sol.530.(b
Let , $\sqrt{56 + \sqrt{56 + \sqrt{56 + \ldots\ldots}}} = x$
$\sqrt{56 + x} = x$
Squaring in both side
$56 + x = x^2 \Rightarrow x^2 - x - 56 = 0 \Rightarrow x = +8, -7$
positive value = 8

Sol.531.(d)
$(\frac{4}{5}$th of 3500) - ($\frac{1}{3}$rd of 6000)
$= (3500 \times \frac{4}{5}) - (6000 \times \frac{1}{3})$
=2800 - 2000 = 800

Sol.532.(b)
$\frac{2+\sqrt{5}}{2-\sqrt{5}} + \frac{2-\sqrt{5}}{2+\sqrt{5}} + \frac{\sqrt{5}-1}{\sqrt{5}+1}$
$= \frac{(2+\sqrt{5})(2+\sqrt{5}) + (2-\sqrt{5})(2-\sqrt{5})}{(2+\sqrt{5})(2-\sqrt{5})}$

$+\frac{\sqrt{5}-1}{\sqrt{5}+1} = \frac{4+5+4+5}{4-5} + \frac{\sqrt{5}-1}{\sqrt{5}+1}$

= -18 + $\frac{\sqrt{5}-1}{\sqrt{5}+1}$ = -18 + $\frac{\sqrt{5}-1}{\sqrt{5}+1}$

$\times \frac{\sqrt{5}-1}{\sqrt{5}-1}$ = -18 + $\frac{3-\sqrt{5}}{2} = \frac{-33-\sqrt{5}}{2}$

Sol.533.(b) $4\frac{1}{3} \times 2\frac{4}{5} \div 2\frac{1}{3}$

$= \frac{13}{3} \times \frac{14}{5} \times \frac{3}{7} = \frac{26}{5} = 5\frac{1}{5}$

Sol.534.(a) 65 × 65 = 4225
Then , 6.5 × 6.5 = 42.25

Sol.535.(a)

$777\frac{1}{5} + 777\frac{2}{5} + 777\frac{3}{5} + 777\frac{4}{5} = 777$

$\times 4 + (\frac{1}{5} + \frac{2}{5} + \frac{3}{5} = \frac{4}{5})$

= 3108 + 2 = 3110

Sol.536.(c) $\frac{320 \div 8 \times 8 \div 4 \times \frac{1}{2}}{180 \times 5 \div 45 - 4}$

$= \frac{40 \times 2 \times \frac{1}{2}}{20-4} = \frac{40}{16} = \frac{5}{2}$

Sol.537.(a)
9 + (45 ÷ 9) - 8 × (-4) = 9 + 5 + 32 = 46

Sol.538.(b) $\{\frac{3}{5} \times [3 + \{3 + (11 + 5 + 6)\}]\}$

$= \{\frac{3}{5} \times 3 + \{3 + 22\}]$

$= \{\frac{3}{5} \times 28 = \frac{84}{5} = 16\frac{4}{5}\}$

Sol.539.(a) 27 × 4.15 + 30.8 ÷ 22
= 27 × 4.15 + 1.4 = 112.05 + 1.4
= 113 .45

Sol.540.(b) $(3^x)(3^y) = 9$ and $(25^x)(5^y)$
$= 625 \Rightarrow (3)^{x+y} = 9$
If x = 2 and y = 0
Satisfies both conditions.

Sol.541.(a) $\sqrt{182.25} = 13.5$

Sol.542.(b) $\frac{(56+34)^2-(56-34)^2}{4 \times 56 \times 34}$

$= \frac{4 \times 56 \times 34}{4 \times 56 \times 34} = 1$

Sol.543.(d) $\frac{119.5^2 - 116.4^2}{(119.5 - 116.4)}$

$= \frac{(119.5 + 116.4) \times (119.5 - 116.4)}{(119.5 - 116.4)}$

= 119.5 + 116 . 4 = 235.9

Sol.544.(d) $= (22 + 8\sqrt{6})^{\frac{1}{2}}$

$= \sqrt{(22 + 8\sqrt{6})} = \sqrt{(4 + \sqrt{6})^2} = 4 + \sqrt{6}$

Sol.545.(b) Difference between ($\frac{2}{3}$ of 3000) and ($\frac{2}{5}$of 1500)

= 2000 - 600 = 1400

Sol.546.(b) $\sqrt{625} \div \sqrt{x} = \frac{1}{5}$

$25 \div \sqrt{x} = \frac{1}{5} = \sqrt{x} = 125 \Rightarrow x = 15625$

Sol.547.(a) $= \sqrt{484\sqrt{25 \div x}} = 22$

$= 484\sqrt{25 \div x} = 484$

$= \sqrt{25 \div x} = 1 = 25 \div x = 1 = x = 25$

Sol.548.(b) $\sqrt{142884} = \sqrt{35721 \times 2 \times 2}$

$= \sqrt{378 \times 378}$ = 378

Sol.549.(c) $\sqrt{(544)^2 - (256)^2}$

$= \sqrt{(544 + 256)(544 - 256)}$

$= \sqrt{800 \times 288}$ = 480

Sol.550.(b) $\frac{8}{9}$ = 0.88

Sol.551.(a) $\sqrt[3]{\sqrt{0.000064}} = \sqrt[3]{0.008}$ = 0.2

Sol.552.(d)

$\frac{5\sqrt{7}}{4\sqrt{7}-0.4} = \frac{5 \times 2.6}{4 \times 2.6 - 0.4} = \frac{13}{10}$ = 1.3

Sol.553.(b)

ascending order= $\frac{12}{18}, \frac{14}{17}, \frac{16}{19}$

Sol.554.(d) $\sqrt{9 + 25a + \sqrt{64}}$
$= 3 + 25\sqrt{4} + 8 = 3 + 50 + 8 = 61$

Sol.555.(a)

x = $\frac{\sqrt{9}+1}{\sqrt{9}-1} = \frac{3+1}{3-1} = \frac{4}{2} = 2$

y = $\frac{\sqrt{16}+1}{\sqrt{16-1}} = \frac{4+1}{4-1} = \frac{5}{3}$

Now,

$(x^2 - y^2) = 2^2 - 2^2 - (\frac{5}{3})^2$

= 4 - $\frac{25}{9} = \frac{36-25}{9} = \frac{11}{9}$

Sol.556.(c) $\sqrt{5^n} = 5$

Squaring both sides, we get $5^n = 5^2$
On comparing we get , n = 2

Sol.557.(b) 18 - [6 ÷ 3 x {8 - (10 x $\frac{1}{2}$)}]

= 18 - [2 × {8 - 5}] = 18 - [2 × 3]
= 18 - 6 = 12

Sol.558.(d) $\sqrt{176 + \sqrt{2401}}$
$= \sqrt{176 + 49} = \sqrt{225}$ = 15

Sol.559.(a) 0.077 ÷7 - 0.005 ÷ 5
= 0 .011 - 0.001= 0.01

Sol.560.(d) The value of the variable x in the equation 3 (5x + 2) - 4 = 2 (1 - 4x) is:
$\Rightarrow 23x = 0 \Rightarrow x = 0$;

Sol.561.(d)

$\{(2-\frac{1}{3}) + (\frac{2}{3} \times 1\frac{1}{5})\} + \frac{3}{5} \times 2\frac{5}{7}$

$= \{(\frac{5}{3} + \frac{4}{5})\} + \frac{3}{5} \times \frac{19}{7}$

$= \frac{37}{15} + \frac{57}{35} = \frac{259+171}{105} = \frac{430}{105} = 4\frac{2}{21}$

Sol.562.(c)

$\sqrt{107 + \sqrt{192 + \sqrt{11 + \sqrt{25}}}}$

$= \sqrt{121}$ = 11

Sol.563.(c) $(0.2)^3 - (0.02)^3$
= 0.008 - 0.000008 = 0.007992

Sol.564.(d) The square root of $5\frac{44}{49}$ is

$= \sqrt{\frac{289}{49}} = \frac{17}{7}$

Sol.565.(c)

$\frac{(28.4)^2 - (24.4)^2}{(28.4 - 24.4)}$ = 28.4 + 24.4 = 52.8

Sol.566.(d) Here we can write 12 into two consecutive factors 3, 4 ; i.e.
12 = 3 × 4 ;
And as the sign is +ve, so we will take the larger factor = 4 ;
So, the value of

$\sqrt{12 + \sqrt{12 + \sqrt{12 + \ldots}}}$ = 4 ;

Sol.567.(b)

$\frac{7}{77} \times 7777077 = 101001 \times 7 = 707007$

Sol.568.(d)
The product of 0.27 and 3.54 = 0.9558 ;
Then the product of 0.27 and 3.54 is less than 5.743 by 4.7872.

Sol.569.(c) $\sqrt{5^n} = 625 \Rightarrow 5^n = (625)^2$
$5^n = (5)^8 \Rightarrow$ n = 8

Sol.570.(b) $\sqrt{1 + \frac{x}{121}} = \frac{12}{11}$

$1 + \frac{x}{121} = \frac{12}{11} \times \frac{12}{11} \Rightarrow \frac{121+x}{121}$

$= \frac{144}{121} \Rightarrow 121 + x = 144 \Rightarrow x = 23$

Sol.571.(c) 0.4 x 0.04 x 0.004 = 0.000064

Sol.572.(a) $\sqrt{\frac{225}{729}} - \sqrt{\frac{25}{144}} - \sqrt{\frac{16}{81}}$

$= \frac{15}{27} - \frac{5}{12} - \frac{4}{9} = \frac{60-45-48}{108}$

$= \frac{-33}{108} = \frac{-11}{36}$

Sol.573.(c)

$\frac{5 \times 1.6 - 2 \times 1.4}{1.3} = \frac{8 - 2.8}{1.3} = \frac{5.2}{1.3} = 4$

Sol.574.(a) $\frac{11}{12}, \frac{12}{13}, \frac{15}{16}, \frac{13}{14}$

Difference of numerator and denominator of all fraction is = 1

So the fraction with the largest numerator and denominator will be the largest fraction.

Largest fraction = $\frac{15}{16}$

Sol.575.(c)

$0.008 \div ? = 0.8 \Rightarrow ? = \frac{0.008}{0.8} = 0.01$

Sol.576.(c) $\sqrt{1296} = x^2 \Rightarrow 36 = x^2 \Rightarrow x = 6$

Sol.577.(a) 1 litre = 1000 ml

Now,

$\frac{180}{1000} = 0.18$

Sol.578.(c) $0.527 \times 2.013 = 1.060851$

Now ,

1.060851 - 1 = 0.060851

Sol.579.(b) $0.36 = \frac{36}{100} = \frac{9}{25}$

sum of the numerator and the denominator = 9 + 25 = 34

Sol.580.(d) $3.14 \times 10^6 = 3140000$

Sol.581.(c) $= \frac{\sqrt{144}}{7} \times \frac{14}{12} \times \frac{7}{\sqrt{196}}$

$= \frac{12}{7} \times \frac{14}{12} \times \frac{7}{14} = 1$

Sol.582.(b) From the options we have

$\frac{11}{12}, \frac{8}{13}, \frac{9}{11}, \frac{10}{14}$

The LCM of 12, 13, 11, 14 is 12012

So, the above number will become:

$\frac{11}{12} \times 12012, \frac{8}{13} \times 12012,$

$\Rightarrow \frac{9}{11} \times 12012 \Rightarrow \frac{10}{14} \times 12012$

$\Rightarrow$ 11011, 7392, 9828, 8580

We get , smallest fraction = $\frac{8}{13}$

Sol.583.(b)

$= \frac{(0.03)^2 + (0.51)^2 + (0.083)^2}{(0.003)^2 + (0.051)^2 + (0.0083)^2}$

$= \frac{(0.03)^2 + (0.51)^2 + (0.083)^2}{(0.03/10)^2 + (0.51/10)^2 + (0.083/10)^2}$

$\Rightarrow \frac{(0.03)^2 + (0.51)^2 + (0.083)^2}{(0.03)^2 + (0.51)^2 + (0.083)^2} \times 100 = 100$

Sol.584.(d) $\frac{(3.6 \times 0.48 \times 2.50)}{(0.12 \times 0.09 \times 0.5)}$

$= \frac{36 \times 48 \times 250}{12 \times 9 \times 5} = 800$

Sol.585.(d)

$(35.7 - (3 + \frac{1}{3 + \frac{1}{3}}) - (2 + \frac{1}{2 + \frac{1}{2}}))$

$= (35.7 - (3 + \frac{3}{10}) - (2 + \frac{2}{5})$

= (35.7 - 3.3 - 2.4) = 35. 7 - 5.7 = 30

Sol.586.(c)

$(7 + 3\sqrt{5})(7 - 3\sqrt{5}) = 49 - 45 = 4$

Square root of 4 = 2

Sol.587.(d)

$\frac{(0.2)^3 + (0.04)^3}{(0.1)^2 \times 0.1 + (0.02) \times (0.02)^2}$

$= \frac{(0.2)^3 + (0.04)^3}{(0.1)^3 + (0.02)^3} = \frac{8[(0.1)^3 + (0.02)^3]}{(0.1)^3 + (0.02)^3}$

$= \frac{(0.1)^3 + (0.02)^3}{(0.1)^3 + (0.02)^3} \times 8 = 8$

Sol.588.(d) we know

$\frac{a^3 - b^3}{a^2 + ab + b^2}$ = (a - b)

Hence ,

$\frac{564 \times 564 \times 564 - 246 \times 246 \times 246}{564 \times 564 + 564 \times 246 + 246 \times 246}$

= (564 - 246) = 318

Sol.589.(d) $\sqrt{6 + \sqrt{5 + \sqrt{12 + \sqrt{16}}}}$

$= \sqrt{6 + \sqrt{5 + \sqrt{12 + 4}}}$

$= \sqrt{6 + \sqrt{5 + 4}} = \sqrt{6 + 3} = 3$

Sol.590.(b) $0.\overline{077} \div 7.\overline{33}$

$= \frac{77}{999} \div \frac{733 - 7}{99} = \frac{77}{999} \times \frac{99}{726}$

$= \frac{7 \times 11}{111 \times 66} = \frac{7}{666}$

Sol.591.(c) $\sqrt{3^n} = \sqrt{6561}$

Squaring both sides

$\Rightarrow 3^n = 6561 \Rightarrow 3^n = 3^8 \Rightarrow n = 8$

Sol.592.(c) $\sqrt{x} \div \sqrt{169} = 0.05$

$\Rightarrow \frac{\sqrt{x}}{13} = 0.05 \Rightarrow \sqrt{x} = 0.65 \Rightarrow x = 0.4225$

Sol.593.(c)

$\frac{396 \div 18 \times 5 - 100}{y} = 7^2 \div 8 + 3.875$

$\Rightarrow \frac{22 \times 5 - 100}{y} = 6.125 + 3.875$

$\Rightarrow \frac{10}{y} = 10 \Rightarrow y = 1$

Sol.594.(c) $= \frac{3\sqrt{2}}{\sqrt{6} - \sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6} - \sqrt{2}} - \frac{6}{\sqrt{8} - \sqrt{12}}$

$= \frac{\sqrt{6}}{\sqrt{2} - 1} - \frac{2\sqrt{6}}{\sqrt{3} - 1} - \frac{3}{\sqrt{2} - \sqrt{3}}$

$= \frac{\sqrt{6}(\sqrt{2} + 1)}{1} - \frac{2\sqrt{6}(\sqrt{3} + 1)}{2} - \frac{3(\sqrt{2} + \sqrt{3})}{-1}$

$= 2\sqrt{3} + \sqrt{6} - 3\sqrt{2} - \sqrt{6} + 3\sqrt{2} + 3\sqrt{3}$

$= 5\sqrt{3}$

Sol.595.(b) $\sqrt{217 + \sqrt{50 + \sqrt{196}}}$

$= \sqrt{217 + \sqrt{50 + 14}} = \sqrt{217 + 8}$

$= \sqrt{225} = 15$

Sol.596.(a)

$\sqrt{2.25} + \sqrt{0.0225} + \sqrt{0.000225}$

= 1.5 + 0.15 + 0.015 = 1.665

Sol.597.(c) $\frac{2160}{\sqrt{x}} = 240$

$\Rightarrow \sqrt{x} = \frac{2160}{240} = 9 = x = 81$

Sol.598.(c) $(0.2)^3 - (0.02)^3$

= 0.008 - 0.000008 = 0.007992

Sol.599.(b)

$\{(2 - \frac{1}{3}) + (\frac{2}{3} \times 1\frac{1}{5})\} + \frac{3}{5} \times 2\frac{5}{7}$

$= \{\frac{5}{3} + (\frac{2}{3} \times \frac{6}{5})\} + \frac{3}{5} \times \frac{19}{7}$

$= (\frac{5}{3} + \frac{4}{5}) + \frac{3}{5} \times \frac{19}{7} = (\frac{25 + 12}{15}) + \frac{57}{35}$

$= \frac{37}{15} + \frac{57}{35} = \frac{(37 \times 7) + (57 \times 3)}{105}$

$= \frac{259 + 171}{105} = \frac{430}{105} = \frac{86}{21} = 4\frac{2}{21}$

Sol.600.(b) $= (3\frac{1}{7} + 4\frac{3}{7}) + \frac{7}{6}$

$= (\frac{22}{7} + \frac{31}{7}) + \frac{7}{6} = \frac{367}{42}$

Sol.601.(b) $18[4 - 3\{6 - (8 \times \frac{1}{2})\}]$

$= 18[4 - 3\{6 - 4\}] = 18[4 - 3 \times 2] = -36$

Sol.602.(d) $\sqrt{5\frac{44}{49}} = \sqrt{\frac{289}{49}} = \frac{17}{7}$

Sol.603.(b)

$\frac{\frac{8}{3} \div \frac{3}{5} \times \frac{7}{5}}{\frac{5}{3} \div \frac{5}{7} \times \frac{8}{9}} \div 9 = \frac{\frac{8}{3} \times \frac{5}{3} \times \frac{7}{5}}{\frac{5}{3} \times \frac{7}{5} \times \frac{8}{9}} \div 9$

$= \frac{\frac{56}{9}}{\frac{56}{27}} \div 9 = \frac{56}{9} \times \frac{27}{56} \times \frac{1}{9} = \frac{1}{3}$

Sol.604.(a) $0.124\overline{64}$

$= \frac{12464 - 124}{99000} = \frac{12340}{99000} = \frac{617}{4950}$

Sol.605.(b) $8.5 - \{5\frac{1}{2} - (7\frac{1}{2} + 2.8 \div x)\} \times 4.25 \div (0.2)^2 = 306$

$\Rightarrow 8.5 - \{\frac{11}{2} - (\frac{15}{2} + \frac{2.8}{x}) \times \frac{4.25}{0.04} = 306$

$\Rightarrow 8.5 - \{\frac{11x - 15x - 5.6}{2x}\} \times 106.25 = 306$

$\Rightarrow 8.5 - (\frac{-4x - 5.6}{2x}) \times 106.25 = 306$

$\Rightarrow 8.5 - (-2 - \frac{2.8}{x}) \times 106.25 = 306$

$\Rightarrow 2 + \frac{2.8}{x} = 2.8 \Rightarrow \frac{2.8}{x} = 0.8$

$\Rightarrow x = \frac{2.8}{0.8} = 3.5$

Sol.606.(c)

$1\frac{1}{5} - 3\frac{2}{4} \div 1\frac{3}{4} \div (x + 3\frac{1}{8}) \div 1\frac{1}{7} = 1$

$\Rightarrow \frac{6}{5} - \frac{14}{4} \div \frac{7}{4} \div (x + \frac{25}{8}) \div \frac{8}{7} = 1$

$\Rightarrow \frac{6}{5} - 2 \div (x + \frac{25}{8}) \div \frac{8}{7} = 1$

$\Rightarrow \frac{1}{5} = 2 \times \frac{8}{8x + 25} \times \frac{7}{8}$

$\Rightarrow 8x + 25 = 70 \Rightarrow x = \frac{45}{8} = 5\frac{5}{8}$

Sol.607.(a)

$\sqrt{58\frac{7}{9}} = \sqrt{\frac{529}{9}} = \frac{23}{3} = 7\frac{2}{3}$

Sol.608.(c) $\frac{2}{3}, \frac{1}{6}, \frac{1}{5}, \frac{3}{7}$

descending order of the fractions

$= \frac{2}{3}, \frac{3}{7}, \frac{1}{5}, \frac{1}{6}$

Sol.609.(d) $\sqrt{2116 \times \sqrt{48 \div x}} = 92$

Squaring both sides, we get,

$\Rightarrow 2116 \times \sqrt{48 \div x} = 92 \times 92$

$\Rightarrow \sqrt{48 \div x} = \frac{92 \times 92}{2116} \Rightarrow \sqrt{48 \div x} = 4$

Squaring both sides,

$\Rightarrow 48 \div x = 16 \Rightarrow x = 3$

Sol.610.(a) $\frac{0.0625}{0.05} = \frac{625}{500} = \frac{5}{4} = 1.25$

Sol.611.(a) $(225 \div 25 - 10) \times 5 + 2 - 7 \times 3 = (9 - 10) \times 5 + 2 - 21$

$= -5 + 2 - 21 = -24$

Sol.612.(d) $\frac{\sqrt{196}}{7} \times \frac{\sqrt{441}}{7} \times \frac{120}{\sqrt{225}}$

$= \frac{14}{7} \times \frac{21}{7} \times \frac{120}{15} = 48$

Sol.613.(c) $\frac{4}{5} + x = \frac{5}{4} = x = \frac{5}{4} - \frac{4}{5}$

$\Rightarrow x = \frac{25 - 16}{20} = x = \frac{9}{20}$

Sol.614.(a) Given, $231 \times 326 = 75306$

So, $2.31 \times 0.326 = 0.75306$

Sol.615.(c) $0.1235235235 = 0.1\overline{235}$

$= \frac{1235 - 1}{9990} = \frac{617}{4995}$

Sol.616.(a)

If A is 55, Z is 11, H is 5 and D is 5

Now,

$A \div Z \times H - D = 55 \div 11 \times 5 - 5$

$= 5 \times 5 - 5 = 25 - 5 = 20$

Sol.617.(b) $3 \times 0.3 \times 0.03 \times 0.003 \times 300 = 0.027 \times 0.003 \times 300 = 0.0243$

Sol.618.(d) $6 \div [5 - \{4 - (3 - \overline{2 - 1})\}]$

$= 6 \div [5 - \{4 - (3 - \overline{1})\}]$

$= 6 \div [5 - \{4 - 2\}] = 6 \div 3 = 2$

Sol.619.(d) $371 \div 16 = 23.1875$

Now , $0.00371 \div 0.016 = 0.231875$

Sol.620.(b)

$$\frac{(0.01)^2 + (0.22)^2 + (0.333)^2 + (0.4444)^2 + (0.55555)^2}{(0.001)^2 + (0.022)^2 + (0.0333)^2 + (0.04444)^2 + (0.055555)^2}$$

$$= \frac{(0.01)^2 + (0.22)^2 + (0.333)^2 + (0.4444)^2 + (0.55555)^2}{\{(0.01)^2 + (0.22)^2 + (0.333)^2 + (0.4444)^2 + (0.55555)^2\} \times \frac{1}{100}}$$

$$= \frac{\{(0.01)^2 + (0.22)^2 + (0.333)^2 + (0.4444)^2 + (0.55555)^2\} \times 100}{(0.01)^2 + (0.22)^2 + (0.333)^2 + (0.4444)^2 + (0.55555)^2}$$

$= 100$

Sol.621.(a)

$3\frac{2}{3} + 6\frac{7}{12} + 4\frac{9}{36} + 5 + 7\frac{1}{12}$

$= (3 + 6 + 4 + 5 + 7) + (\frac{2}{3} + \frac{7}{12} + \frac{9}{36} + \frac{1}{12}) = 25 + \frac{24 + 21 + 9 + 3}{36}$

$= 25 + \frac{57}{36} = 25 + 1 + \frac{7}{12} = 26 + \frac{7}{12}$

26 is whole number

So, $1 - \frac{7}{12} = \frac{5}{12}$

Sol.622.(a)

$x = \sqrt{(1 + \frac{\sqrt{3}}{2})} + \sqrt{(1 - \frac{\sqrt{3}}{2})}$

Squaring both side

$x^2 = (1 + \frac{\sqrt{3}}{2}) + (1 - \frac{\sqrt{3}}{2}) + 2\sqrt{(1 + \frac{\sqrt{3}}{2})(1 - \frac{\sqrt{3}}{2})}$

$\Rightarrow x^2 = 2 + 2\sqrt{1 - \frac{3}{4}}$

$\Rightarrow x^2 = 2 + 2\sqrt{\frac{1}{4}} = 2 + 1 = 3 \Rightarrow x = \sqrt{3}$

Sol.623.(c) $0.666.. = \frac{666}{999} = \frac{2}{3}$

Sol.624.(a)

$55 + [29 - \{25 - (6 - 24 \div 6 \times 8)\}]$

$= 55 + [29 - \{25 - (6 - 4 \times 8)\}] = 55 - 22 = 33$

Sol.625.(c) uneaten pizza $= \frac{2}{3} \times \frac{3}{5} = \frac{2}{5}$

Sol.626.(a) Given ,$\sqrt{40} = 6.3245$

$\sqrt{\frac{8}{5}} = \sqrt{\frac{8}{5} \times \frac{5}{5}} = \sqrt{\frac{40}{25}}$

$= \frac{6.3245}{5} = 1.2649$

Sol.627.(d)

$4\sqrt{0.000081} = 4 \times \sqrt{\frac{81}{1000000}}$

$= 4 \times \frac{9}{1000} = \frac{36}{1000} = 0.036$

Sol.628.(a)

Let the number multiplied by = x

A/Q,

$\Rightarrow \frac{11}{5} \times x = \frac{27}{5}$

$\Rightarrow x = \frac{27 \times 5}{11 \times 5} = \frac{27}{11} = 2\frac{5}{11}$

Sol.629.(a) $\frac{1800 \div (24 \div 8 \times 3) + 16}{\frac{3}{4} \times (32 \div 2)}$

$= \frac{1800 \div 9 + 16}{12} = \frac{200 + 16}{12} = \frac{216}{12} = 18$

Sol.630.(a) Ascending order = 0.0882, 0.25, 1.24, 2.67

Sol.631.(d) $x = -102 - 3[-2\{21 + 16 \div (20 \div 5) - 3 \times 2^2\}] - 11$

$\Rightarrow x = -102 - 3[-2\{21 + 16 \div 4 - 12\}] - 11$

$\Rightarrow x = -102 - 3[-2\{21 + 4 - 12\}] - 11$

$\Rightarrow x = -102 - 3[-2\{13\}] - 11 \Rightarrow x = -35$

Sol.632.(a) $2 + \frac{1}{1 + \frac{2}{1\frac{1}{4}}} + 1$

$= 2 + \frac{1}{1 + \frac{2}{\frac{5}{4}}} + 1 = 2 + \frac{1}{1 + \frac{8}{5}} + 1$

$= 2 + \frac{5}{13} + 1 = \frac{44}{13}$

Sol.633.(a) LCM of the denominator (7 , 6 , 3 and 8) = 168

multiply by 168 with each fraction,

$\frac{4}{7} \times 168 = 96$, $\frac{5}{6} \times 168 = 140$,

$\frac{2}{3} \times 168 = 112$, $\frac{7}{8} \times 168 = 147$

ascending order of fractions

$= \frac{4}{7} < \frac{2}{3} < \frac{5}{6} < \frac{7}{8}$

Sol.634.(b) $1498 \times 1498 = 22,44,004$

Sol.635.(c) $\frac{6}{15} = 0.4$, so that 6 / 15 is a terminating decimal .

Note - (i) terminating decimal - A terminating decimal, true to its name, is a decimal that has an end

(i) Non - terminating decimal - A non-terminating, non-repeating decimal is a decimal number that continues

endlessly, with no group of digits repeating endlessly. Decimals of this type cannot be represented as fractions, and as a result are irrational numbers

Sol.636.(a) 24 + 13 - 5 × $\frac{1}{2}$ × 10 - {45 ÷ (17 - 2)} = 24 + 13 - 5 × $\frac{1}{2}$ × 10 - {45 ÷ 15} = 24 + 13 - 5 × $\frac{1}{2}$ × 10 - 3
= 24 + 13 - 25 - 3 = 37 - 28 = 9

Sol.637.(c) The number $0.\overline{13}$ in the form of $\frac{p}{q}$ is equal to = $\frac{13}{99}$

Sol.638.(d)
$\sqrt{(10 + \sqrt{(200 + \sqrt{(596 + \sqrt{841})})})}$
$= \sqrt{(10 + \sqrt{(200 + \sqrt{(596 + 29)}})}$
$= \sqrt{(10 + \sqrt{(200 + 25)}})$
$= \sqrt{(10 + 15)}$ = 5 = $5\sqrt{1}$

Sol.639.(b) A/Q,
12 × $\frac{2}{7}$ × $\frac{1}{4}$ × $\frac{1}{3}$ = $\frac{2}{7}$

Sol.640.(b) $\frac{70 + 5 \times 2 \div 10 + 15 - 10}{25 \times 6 + 2}$
$= \frac{70 + 5 \times 0.2 + 15 - 10}{150 + 2}$
$= \frac{70 + 1 + 15 - 10}{152} = \frac{86 - 10}{152}$
$= \frac{76}{152} = \frac{1}{2}$

Sol.641.(a) $\frac{2}{5} + \frac{2}{10} = \frac{N+1}{N+5}$
$\frac{4+2}{10} = \frac{N+1}{N+5} \Rightarrow \frac{6}{10} = \frac{N+1}{N+5}$
Let , N = 5
$\frac{6}{10} = \frac{6}{10}$ (LHS = RHS)
Hence N = 5

Sol.642.(c) $\frac{1}{3} + \frac{2}{9} = \frac{N+1}{N+5} = \frac{5}{9}$
$= \frac{N+1}{N+5} \Rightarrow$ 5N + 25 = 9N + 9 = N = 4

Sol.643.(c) $\frac{\sqrt{5}-1}{\sqrt{5}+1} - \frac{\sqrt{5}+1}{\sqrt{5}-1}$ = a + b$\sqrt{5}$
$\frac{(\sqrt{5}-1)(\sqrt{5}-1) - (\sqrt{5}+1)(\sqrt{5}+1)}{(\sqrt{5}-1)(\sqrt{5}+1)}$ = a + b$\sqrt{5}$
$\Rightarrow \frac{5 - 2\sqrt{5} + 1 - 5 - 2\sqrt{5} - 1}{(\sqrt{5}-1)(\sqrt{5}+1)}$ = a + b$\sqrt{5}$
$\Rightarrow \frac{-4\sqrt{5}}{4}$ = a + b$\sqrt{5} - \sqrt{5}$ = a + b$\sqrt{5}$
a = 0, b = -1
So, (a + b) (a - b) ÷ $(a^2 + b^2)$ = $\frac{a^2 - b^2}{a^2 + b^2}$ = -1

Sol.644.(c) $\sqrt{54} \times \sqrt{6}$ = √324 = 18

Sol.645.(c) 1 mm = $\frac{1}{10}$cm = $\frac{1}{1000}$m
= $\frac{1}{1000000}$ = $0.000001\ km$

Sol.646.(d)
$\frac{7}{18}$ = 0.389 and $\frac{3}{5}$ = 0.6 , $\frac{1}{3} = 0.33$
It does not lie between $\frac{7}{18}$ and $\frac{3}{5}$

Sol.647.(d) Going through the options one by one.
$\Rightarrow$1- $(0.09)^2$= 1-0.0081= 0.9919
$\Rightarrow (1 - 0.09)^2$ = 0.8281
$\Rightarrow (0.09)^2$ = 0.0081
So, we can see that option (d) is closest to Zero.

Sol.648.(b)
$\frac{(0.01)^2 + (0.22)^2 + (0.333)^2 + (0.4444)^2}{(0.001)^2 + (0.022)^2 + (0.0333)^2 + (0.04444)^2}$
$= \frac{((0.01)^2 + (0.22)^2 + (0.333)^2 + (0.4444)^2) \times 10^2}{((0.01)^2 + (0.22)^2 + (0.333)^2 + (0.4444)^2)}$
= 100

Sol.649.(a) $1.\overline{45} + 0.3\overline{12} - 1.11\overline{2}$
$\Rightarrow$1+ $\frac{45}{99} + \frac{312-3}{990}$ - $\left(1 + \frac{112-11}{900}\right)$
$\Rightarrow$1+ $\frac{45}{99} + \frac{309}{990}$ - 1- $\frac{101}{900} = \frac{589}{900}$

Sol.650.(c) $3\frac{21}{23} \div 3\frac{15}{31} = \frac{90}{23} \div \frac{108}{31}$
$= \frac{90}{23} \times \frac{31}{108} = \frac{155}{138}$

Sol.651.(c)
$3^{2x+1} - 3^x = 3^{x+3} - 3^2$ --- (i)
By the option
(2 , -1)Putting the value of x in equation (i)
$3^{2\times 2+1} - 3^2 = 3^{2+3} - 3^2$
$3^5 - 3^2 = 3^5 - 3^2 \Rightarrow 3^3 = 3^3$ (satisfied)

Sol.652.(b) $\frac{8}{5} - \frac{5}{8} = \frac{64-25}{40} = \frac{39}{40}$

Sol.653.(c) Put x = 6
$\Rightarrow 4 \times 6 - 3y = 9 \Rightarrow 24 - 3y = 9$
$\Rightarrow 3y = 24 - 9 = 15 \Rightarrow y = 5$

Sol.654.(b) $\frac{-40}{56}$
Divide numerator and denominator by 8, we get $\Rightarrow \frac{-5}{7}$

Sol.655.(c) $\frac{c}{d} = 1 \div \frac{3}{4} \Rightarrow \frac{c}{d} = \frac{4}{3}$
Now,
$\frac{c+d}{c-d} = \frac{4+3}{4-3}$ = 7

Sol.656.(b) $\sqrt[5]{\frac{32}{243}} = \sqrt[5]{\frac{2^5}{3^5}} = \frac{2}{3}$

Sol.657.(c) $\left(\frac{2}{3}\right)^{x+1} = \left(\frac{3}{2}\right)^{x-1}$
$\Rightarrow \left(\frac{2}{3}\right)^{x+1} = \left(\frac{2}{3}\right)^{-(x-1)}$
$\Rightarrow$ x + 1 = - x + 1 $\Rightarrow$ 2x = +1 - 1 $\Rightarrow$ x = 0

Sol.658.(d) $\sqrt[3]{250}$ is lie between 6 and 7
$6^3 = 216\ and\ 7^3 = 343$

Sol.659.(b) $\sqrt{0.0121} + \sqrt[3]{0.008}$
0.11 + 0.2 = 0.31

Sol.660.(b) = $\frac{(0.03) \times (0.05) \times (1.5)}{0.0225}$
$= \frac{0.0015 \times 1.5}{0.0225} = \frac{0.00225}{0.0225}$ = 0.1

Sol.661.(a) Sum of the fractions
$= 1\frac{5}{7} + 1\frac{2}{5} = \frac{12}{7} + \frac{7}{5}$
$= \frac{(60+49)}{35} = 3\frac{4}{35}$

Sol.662.(a) $(2 + \sqrt{5})^4 - (2 - \sqrt{5})^4$
$(2 + \sqrt{5})^{2\times 2} - (2 - \sqrt{5})^{2\times 2}$
$= (2 + \sqrt{5})^2 \times (2 + \sqrt{5})^2$ -
$(2 - \sqrt{5})^2 \times (2 - \sqrt{5})^2$
= (4 + 5 + 2 × 2 × $\sqrt{5}$) (4 + 5 + 2 × 2 ×$\sqrt{5}$)
- (4 + 5 - 2 × 2 × $\sqrt{5}$) (4 + 5 - 2 × 2 × $\sqrt{5}$)
= (9 + 4$\sqrt{5}$)(9 + 4$\sqrt{5}$) - (9 - 4$\sqrt{5}$)(9 - 4$\sqrt{5}$)
= (9 + 4$\sqrt{5}$)² - (9 - 4$\sqrt{5}$)²
= (161 + 72$\sqrt{5}$) - (161 - 72$\sqrt{5}$) = 144$\sqrt{5}$

Sol.663.(d) $\frac{1}{2}\left[\frac{1}{3} - \left(\frac{1}{2} - \frac{1}{4}\right) + \frac{1}{2} - \frac{1}{4}\right]$
$= \frac{1}{2}\left[\frac{1}{3} - \frac{1}{4} + \frac{1}{4}\right] = \frac{1}{6}$

Sol.664.(d) The number should be added to $\frac{-5}{7}$ to get $\frac{-2}{3}$ is :
$= \left(\frac{-2}{3} - \frac{-5}{7}\right) = \frac{1}{21}$

Sol.665.(a) x + $\frac{5}{27} = \frac{12}{27} \Rightarrow x = \frac{7}{27}$

Sol.666.(c) $\sqrt{\frac{576}{625}} = \frac{24}{25} = 0.96$

Sol.667.(c) $\frac{1}{2}$ [$\frac{3}{4}$ - {$\frac{1}{4}$ - (-5 - 3)}]

= $\frac{1}{2}$ [$\frac{3}{4}$ - {$\frac{1}{4}$ - (-8)}]

= $\frac{1}{2}$[$\frac{3}{4}$ - {$\frac{1}{4}$ + 8)}]

= $\frac{1}{2}$ [$\frac{3}{4}$ - $\frac{33}{4}$] ⇒ $\frac{1}{2}$ × $\frac{-30}{4}$ = $\frac{-15}{4}$

= -3$\frac{3}{4}$

Sol.668.(d) = -5 {-5 - (-5 - 2)-5}

= - 5 { - 5 + 7 -5 } = - 5 {- 3} = 15

Sol.669.(c) ($\frac{1}{2}$ + $\frac{1}{3}$ + $\frac{1}{5}$) + x = 3

⇒ ($\frac{15+10+6}{30}$) + x = 3 ⇒ $\frac{31}{30}$ + x = 3

⇒ x = 3 - $\frac{31}{30}$ = x = $\frac{59}{30}$

Sol.670.(c) $\frac{-5}{11}$ + x = $\frac{26}{33}$

⇒ x = $\frac{5}{11}$ + $\frac{26}{33}$ = x = $\frac{41}{33}$

Sol.671.(a) $\frac{(54.542^2 - 45.458^2)}{(61.738 - 52.654)}$

= $\frac{(54.542 + 45.458)(54.542 - 45.458)}{9.084}$

= $\frac{100 \times 9.084}{9.084}$ = 100

Sol.672.(d) $\sqrt{40} = 6.325$

$\sqrt{\frac{8}{5}}$ = $\sqrt{\frac{8}{5} \times \frac{5}{5}}$ = $\sqrt{\frac{40}{25}}$

= $\frac{6.325}{5}$ = 1.265

Sol.673.(b)

$\frac{3\frac{1}{4} - \frac{4}{5} \times \frac{5}{6}}{4\frac{1}{3} \div \frac{1}{5} - (\frac{3}{10} + 21\frac{1}{5})}$ - $(1\frac{2}{3} \times 1\frac{1}{2})$ = ?

= $\frac{\frac{13}{4} - \frac{2}{3}}{\frac{13}{3} \times 5 - (\frac{3}{10} + \frac{106}{5})}$ - ($\frac{5}{3} \times \frac{3}{2}$)

⇒ $\frac{\frac{31}{12}}{\frac{65}{3} - \frac{215}{10}}$ - $\frac{5}{2}$ = $\frac{31}{12} \times \frac{30}{5} - \frac{5}{2}$

= $\frac{31}{2}$ - $\frac{5}{2}$ = 13

Sol.674.(c) The denominator of all the factor are 3, 4, 5, 6

LCM of (3, 4, 5, 6) = 60

Now fraction with denominator 60 ,we have

$\frac{2}{3}$ ⇒ $\frac{2 \times 20}{3 \times 20}$ = $\frac{40}{60}$(Smallest)

$\frac{3}{4}$ ⇒ $\frac{3 \times 15}{4 \times 15}$ = $\frac{45}{60}$

$\frac{4}{5}$ ⇒ $\frac{4 \times 12}{5 \times 12}$ = $\frac{48}{60}$

$\frac{5}{6}$ ⇒ $\frac{5 \times 10}{6 \times 10}$ = $\frac{50}{60}$(Largest)

Difference between the largest and the smallest fractions

⇒ $\frac{5}{6}$ - $\frac{2}{3}$ = $\frac{1}{6}$

Sol.675.(a) $\frac{1}{2} = 0.5 \Rightarrow \frac{3}{5} = 0.6$

⇒$\frac{2}{7} = 0.28 \Rightarrow \frac{5}{6} = 0.83$

Smallest fraction = $\frac{2}{7}$ =(0.28)

Sol.676.(c) $1\frac{1}{4} + 1\frac{1}{6} - 1\frac{1}{8}$ = x + $1\frac{1}{12}$

⇒ x = $\frac{5}{4} + \frac{7}{6} - \frac{9}{8} - \frac{13}{12}$

⇒ x = $\frac{30 + 28 - 27 - 26}{24}$ = $\frac{5}{24}$

Sol.677.(a) $\frac{5}{6}$ = 0.83, $\frac{3}{7}$ = 0.428, $\frac{8}{9}$

= 0.88, $\frac{3}{14}$ = 0.214

Here, 0.88 > 0.83 > 0.428 > 0.214

After arranging descending order we get,

$\frac{8}{9}, \frac{5}{6}, \frac{3}{7}, \frac{3}{14}$

Sol.678.(a)

=$\sqrt{176 + \sqrt{2401}} = \sqrt{176 + 49}$

= $\sqrt{225}$ = 15

Sol.679.(d)

$\frac{3}{11} < \frac{x}{3} < \frac{7}{11}$ = 9 < 11 x < 21

According to the option , the value of x should only be equal to 1.

9 < 11 × 1 < 21 ⇒ 9 < 11 < 21..... Satisfied.

Sol.680.(d) $\frac{[18 \div 2 + (5 \times 3)]}{[5 \times 3 - 18 \div 2]}$

= $\frac{[18 \div 2 + 15]}{[5 \times 3 - 9]}$ = $\frac{[9 + 15]}{[15 - 9]}$ = $\frac{24}{6}$ = 4

Sol.681.(a) $\frac{x}{\sqrt{128}} = \frac{\sqrt{162}}{x}$

⇒ $x^2 = \sqrt{128} \times \sqrt{162}$

⇒ $x^2 = \sqrt{16 \times 8 \times 18 \times 9}$

⇒ $x^2 = 4 \times 9 \times 4 = 144 \Rightarrow x = 12$

Sol.682.(a)

8 ÷ [(9 - 5) ÷ {(7 - 2) ÷ (3 + 9 ÷ 24)}]

= 8 ÷ [4 ÷ {5 ÷ (3 + $\frac{3}{8}$)}]

= 8 ÷ [4 ÷ {5 ÷ ($\frac{27}{8}$)}]

= 8 ÷ [4 ÷ $\frac{40}{27}$] = 8 ÷ $\frac{27}{10}$ = $\frac{80}{27}$

Sol.683.(a) Let number be x

According to the question,

⇒ x - x × $\frac{1}{7}$ = x - 30

⇒ $\frac{7x - x}{7}$ = x - 30

⇒ 6x = 7x - 210 ⇒ x = 210

Hence the number is 210.

Sol.684.(a)

Given, $\sqrt{25 + 10\sqrt{6}} + \sqrt{25 - 10\sqrt{6}}$

We can write this as $\sqrt{\left(\sqrt{15} + \sqrt{10}\right)^2}$ + $\sqrt{\left(\sqrt{15} - \sqrt{10}\right)^2}$

$\left(\sqrt{15} + \sqrt{10}\right) + \left(\sqrt{15} - \sqrt{10}\right) = 2\sqrt{15}$

Sol.685.(a) (1 + $\frac{10}{101}$) + (1 - $\frac{10}{101}$)

($\frac{111}{101}$) + ($\frac{91}{101}$) = $\frac{202}{101}$ = 2

Sol.686.(a) $36^3 \times \left(64^2\right)^{\frac{1}{2}} \times 144 \times 9 \div \left(9^3 \times 72^2\right) = 4^x$

$\frac{36^3 \times 64 \times 144 \times 9}{9 \times 9 \times 9 \times 72 \times 72} = 4^x \Rightarrow 4^5 \Rightarrow x = 5$

Sol.687.(b)

$\sqrt{7^2 - \left(3\sqrt{5}\right)^2} = \sqrt{49 - 45} = \sqrt{4} = 2$

Sol.688.(a) [3 - 2] × [$\frac{6}{25} \times 100$] = 24

Sol.689.(d) 45 of $\frac{3}{5} \div 1\frac{2}{7}$ + 3 of $\frac{1}{3}$ - 10

= 27 ÷ $\frac{9}{7}$ + 1 − 10 = 27 × $\frac{7}{9}$ + 1 − 10

= 22 − 10 = 12

Sol.690.(a) 0.032 x 0.2 + 0.32 x 0.002

⇒ $32 \times 2 \times 10^{-4} + 32 \times 2 \times 10^{-5}$

= $\frac{64}{100000} + \frac{64 \times 10}{10000} \Rightarrow \frac{704}{100000}$

⇒ 0.00704

Sol.691.(c) $\frac{2}{1 - \sqrt{2}} \times \frac{1 + \sqrt{2}}{1 + \sqrt{2}}$

= $\frac{2(1 + \sqrt{2})}{-1}$ = - $2\left(1 + \sqrt{2}\right)$

Sol.692.(c) $\frac{5}{6}$ = 0.833, $\frac{6}{11}$ = 0.545, $\frac{2}{3}$

= 0.666, $\frac{8}{9}$ = 0.888 $\frac{6}{7}$ = 0.857

So , $\frac{8}{9}$ is greatest fraction

Sol.693.(c)

$\frac{1}{\sqrt{2} + \sqrt{3} - \sqrt{5}} + \frac{1}{\sqrt{2} - \sqrt{3} - \sqrt{5}}$

= $\frac{\sqrt{2} - \sqrt{3} - \sqrt{5} + \sqrt{2} + \sqrt{3} - \sqrt{5}}{\left(\sqrt{2} - \sqrt{5}\right)^2 - \left(\sqrt{3}\right)^2}$

$\frac{2(\sqrt{2} - \sqrt{5})}{7 - 2\sqrt{10} - 3}$ = $\frac{2(\sqrt{2} - \sqrt{5})}{2\left(2 - \sqrt{10}\right)}$

= $\frac{(\sqrt{2} - \sqrt{5})}{\left(2 - \sqrt{10}\right)}$ = $\frac{(\sqrt{2} - \sqrt{5})}{\sqrt{2}(\sqrt{2} - \sqrt{5})}$ = $\frac{1}{\sqrt{2}}$

Sol.694.(c)

$\left(\frac{2}{3}\right)+\left(\frac{5}{6}\right)-\left(\frac{1}{9}\right)+\left(\frac{7}{9}\right)$

$\frac{12+15-2+14}{18}=\frac{39}{18}=\frac{13}{6}$

Sol.695.(c) $3.\overline{36}-2.\overline{05}+1.\overline{33}$

$4.\overline{69}-2.\overline{05}=2.\overline{64}$

Sol.696.(b) $1035\div[\frac{3}{4}(71+65)-15\frac{3}{4}]$

$=1035\div[\frac{3}{4}\times136-\frac{63}{4}]$

$=1035\div\frac{408-63}{4}=\frac{1035\times4}{345}=12.$

Sol.697.(c) $\frac{15}{16}=0.93,\ \frac{24}{25}=0.96,=$

$\frac{34}{35}=0.97,\ \frac{19}{20}=0.95$ greatest number is $\frac{34}{35}$

Sol.698.(c) $0.034=\frac{x}{10}\Rightarrow x=0.34$

Sol.699.(b) $\frac{7}{8}=0.875,\ \frac{15}{19}=0.789,\ \frac{17}{21}$

$=0.809,\ \frac{13}{16}=0.812$

Smallest fraction $=\frac{15}{19}$

Sol.700.(c) $\left(\sqrt{3}-\frac{1}{\sqrt{3}}\right)^2=\left(\sqrt{3}\right)^2+\left(\frac{1}{\sqrt{3}}\right)^2-2\times\left(\sqrt{3}\right)\times\left(\frac{1}{\sqrt{3}}\right)$

$=3+\frac{1}{3}-2=\frac{10}{3}-2=\frac{4}{3}$

Sol.701.(b) x = 16% of x + 42

$x=\frac{16}{100}\times x+42\ \Rightarrow\ x=\frac{16x+4200}{100}$

$84x=4200\rightarrow x=50$

Sol.702.(a)

Decimal equivalent of $\frac{7}{8}=0.875$

Sol.703.(d) Total no. of one fifth in 200

$\rightarrow\frac{200}{\frac{1}{5}}=1000$

Sol.704.(d)

$(100)^{\frac{1}{2}}\times(0.001)^{\frac{1}{3}}-(0.0016)^{\frac{1}{4}}$

$=(10^2)^{\frac{1}{2}}\times(\frac{1}{1000})^{\frac{1}{3}}-(\frac{16}{10000})^{\frac{1}{4}}$

$=10\times(\frac{1}{10})^{3\times\frac{1}{3}}-(\frac{2}{10})^{4\times\frac{1}{4}}$

$=10\times\frac{1}{10}-\frac{1}{5}=\frac{4}{5}$

Sol.705.(c) $\frac{x+a}{x+b}=\frac{x+3a}{x+a+b}$

$x^2+ax+bx+ax+a^2+ab$

$=x^2+3ax+bx+3ab$

$2ax+a^2+ab=3ax+3ab$

$a^2=ax+2ab\Rightarrow x=a-2b$

Sol.706.(b) $\frac{3}{4}[1\frac{1}{6}-(1\frac{1}{2}-\frac{1}{3})]$

$=\frac{3}{4}[\frac{7}{6}-\frac{7}{6}]=0.$

Sol.707.(b) $\frac{7}{12}=0.583$ and $\frac{11}{16}=0.68$

Now , by option $\frac{1}{2}=0.5,\ \frac{5}{8}=0.625,\ \frac{7}{8}$

$=0.875,\ \frac{3}{8}=0.375$

Clearly, $\frac{5}{8}$ is greater than $\frac{7}{12}$ but lesser than $\frac{11}{16}$.

Sol.708.(d) Given, a * b = (a + b) + ab

$[(3+5)+3\times5]-[(2+3)+2\times3]$

$(8+15)-(5+6)=23-11=12$

Sol.709.(a)

$(1-\frac{1}{2})(1-\frac{1}{3})(1-\frac{1}{4})....(1-\frac{1}{50})$

$=\frac{1}{2}\times\frac{2}{3}\times\frac{3}{4}\ldots\ldots\frac{49}{50}=\frac{1}{50}$

Sol.710.(a)

$(\frac{1}{4}-\frac{1}{5}+\frac{3}{4}-\frac{4}{5})\div(\frac{2}{5}-\frac{5}{9}+\frac{3}{5}-\frac{11}{18})$

$(\frac{4}{4}-\frac{5}{5})\div(\frac{5}{5}-\frac{21}{18})$

$(0)\div(1-\frac{21}{18})=0$

Sol.711.(c) $\frac{3}{4}=0.75,\ \frac{11}{13}=0.84,$

$\frac{5}{7}=0.71,\ \frac{9}{11}=0.81$

Clearly , Smallest fraction is $\frac{5}{7}$

Sol.712.(c)

Formula : $\left[(a+b)^2-(a-b)^2=4ab\right]$

$\frac{(82+28)^2-(82-28)^2}{82\times28}$

$=\frac{4\times82\times28}{82\times28}=4$

Sol.713.(b)

$\frac{5x}{2}-\frac{5}{3}(\frac{3}{2}+\frac{4x}{3})=\frac{5}{6}$

$\frac{5x}{2}-\frac{5}{2}-\frac{20x}{9}=\frac{5}{6}$

$\frac{5x}{2}-\frac{20x}{9}=\frac{5}{6}+\frac{5}{2}$

$\frac{5x}{18}=\frac{20}{6}\ \Rightarrow x=12$

Sol.714.(c) $\sqrt{0.015625}\times\sqrt{0.0256}$

$=0.125\times0.16=0.02$

Sol.715.(b) $12-20\%\ of\ (42\times5\div15-18\times10\div15+8)$

$=12-\frac{1}{5}\ of\ (42\times\frac{1}{3}-18\times\frac{2}{3}+8)$

$=12-\frac{1}{5}\ of\ (14-12+8)$

$=12-\frac{1}{5}\times10=10$

Sol.716.(a) $\sqrt{0.000225}=\sqrt{\frac{225}{1000000}}$

$=\frac{15}{1000}=0.015$

Sol.717.(c) Let the number be x.

ATQ, $x+16(\frac{1}{x})=10$

$\Rightarrow x^2+16=10x$

$\Rightarrow x^2-10x+16=0$

$\Rightarrow x^2-8x-2x+16=0$

$\Rightarrow(x-8)(x-2)=0$

$\Rightarrow x=2,8$

Hence, the required number = 8

Sol.718.(c)

$(x-1)^2+(y-2)^2=(x-1)(y-2)$

By hits and trial method ,

Putting the value of x =1 and y = 2

$(1-1)^2+(2-2)^2=(1-1)(2-2)$

$0=0\ \Rightarrow$ L.H.S. = R.H.S.

Now , 2x +3y = 2×1 + 3×2 = 8

Sol.719.(a) $\sqrt{x}+0.24=\sqrt{0.1296}$

$\sqrt{x}=0.36-0.24$

$\sqrt{x}=0.12\ \Rightarrow x=0.0144$

Sol.720.(d)

$20-2[25\%\text{ of }(15\times8\div6+12)]$

$\Rightarrow\ 20-2[25\%\text{ of }(15\times\frac{4}{3}+12)]$

$\Rightarrow\ 20-2[25\%\text{ of }32]$

$\Rightarrow\ 20-16=4$

Sol.721.(d)

$(0.1^2-0.0252^2)\div(0.1-0.025)$

$\frac{(0.1+0.025)(0.1-0.025)}{(0.1-0.025)}$

$=(0.1+0.025)=0.125$

Sol.722.(d) $\frac{5x}{2}-\frac{1}{4}(6x-\frac{5}{3})=\frac{7}{6}$

$\frac{5x}{2}-\frac{(18x-5)}{12}=\frac{7}{6}$

$\frac{(30x-18x+5)}{12}=\frac{7}{6}$

$12x=14-5$

$x=\frac{3}{4}$

Sol.723.(c) $\sqrt{0.12225}\approx\sqrt{0.1225}$

Therefore, $\sqrt{0.2025}+\sqrt{0.1225}$

$=\sqrt{(0.45)^2}+\sqrt{(0.35)^2}$

(0.45) + (0.35) = 0.8

Sol.724.(c) $\frac{5x}{3}-\frac{7}{2}(\frac{2x}{5}-\frac{1}{3})=\frac{1}{3}$

$\rightarrow \frac{5x}{3} - \frac{7}{2}\left(\frac{6x-5}{15}\right) = \frac{1}{3}$

$\rightarrow \frac{50x-42x+35}{30} = \frac{1}{3}$

$\rightarrow 8x = -25 \rightarrow x = -\frac{25}{8}$

Sol.725.(b)

$16 - [25\%\text{of } (14 \times 10 \div 35 + 12 \times 10 \div 15)]$

$16 - [25\% \text{ of } (14 \times \frac{2}{7} + 12 \times \frac{2}{3})]$

$16 - [\frac{1}{4} \times (4+8)] = 13$

Sol.726.(c)

$\frac{(0.12\times0.12\times0.12)\times(1.32\times1.32\times1.32)}{(0.52\times0.52)}$

$= 0.0147$

Sol.727.(b) $-7(2x+4y) - 2(x-2y)$

$= -16x - 24y = -8(2x+3y)$

Sol.728.(c)

$\frac{0.088}{x} = 0.02 \Rightarrow x = \frac{8.8}{2} = 4.4$

Sol.729.(b) $\sqrt{(10+\sqrt{25})(12-\sqrt{49})}$

$= \sqrt{(10+5)(12-7)} = \sqrt{75} = 5\sqrt{3}$

Sol.730.(a)

$\frac{5x-15}{y+z} = \frac{5\times15-15}{20+10} = \frac{60}{30} \rightarrow 2$

Sol.731.(d) $\frac{23\times552\div24+23}{552\div23-1}$

$\Rightarrow \frac{23\times23+23}{24-1} = \frac{23\times23+23}{23}$

$\Rightarrow \frac{23(23+1)}{23} = 24$

Sol.732.(c)

Given that the value of x = 0.344444.....

$\Rightarrow x = .3\overline{4} \Rightarrow x = \frac{34-3}{90} = \frac{31}{90}$

Sol.733.(a)

$\sqrt{(189-x)} = \sqrt{(178-\sqrt{81})}$

Squaring both sides ,

$(189 - x) = (178 - 9) \Rightarrow x = 20$

Sol.734.(b)

$128 - [56 \div \{46 \div 23 - (9 - 81 \div 9)\}]$

$= 128 - [56 \div \{46 \div 23\}]$

$= 128 - [56 \div 2] = 128 - [28] = 100$

Sol.735.(c)

$= \left(2^4 \div 8\right)^4 + \sqrt{(135-\sqrt{196})}$

$= \left(2^4 \div 8\right)^4 + \sqrt{(135-14)}$

$= (2)^4 + \sqrt{121} \Rightarrow 16 + 11 = 27$

Sol.736.(d) $\left(x^3\right) \div 11 = 968$

$\Rightarrow \left(x^3\right) = 968 \times 11 = 11\times11\times2\times2\times2\times11$

Taking cube root both sides :-

$= \sqrt{\left(x^3\right)} = \sqrt{11\times11\times2\times2\times2\times11}$

$\Rightarrow x = 22$

Sol.737.(c) $\frac{11\times132\div12+11}{108\div9-1}$

$= \frac{11\times11+11}{12-1} = \frac{11(11+1)}{11} = 12$

Sol.738.(a) $\frac{37}{20} + \frac{3}{10} - \frac{5}{4}$

$= \frac{37}{20} + \frac{6}{20} - \frac{25}{20} = \frac{37+6-25}{20}$

$\Rightarrow \frac{18}{20} = 0.90$

Sol.739.(a) $\left(x^3\right) \div 29 = 841$

$\Rightarrow \frac{\left(x^3\right)}{29} = 841 \Rightarrow \left(x^3\right) = 841 \times 29$

Taking cube root both sides:-

$\Rightarrow x = 29$

Sol.740.(d)

Given that the value of x = 0.5808080....

$\Rightarrow x = 5\overline{80} \Rightarrow x = \frac{580-5}{990} = \frac{575}{990}$

Sol.741.(c)

Clearly , 5776 is a perfect square of **76**.

Sol.742.(a) $\left(x^3\right) \div 14 = 1568$

$\Rightarrow \left(x^3\right) = 1568 \times 14$

$= 14\times14\times2\times2\times2\times14$

Taking cube root both sides :-

$\Rightarrow \sqrt{\left(x^3\right)} = \sqrt{14\times14\times2\times2\times2\times14}$

$\Rightarrow x = 28$

Sol.743.(d) $\frac{1}{8} + \frac{3}{4} - \frac{5}{8}$

$= \frac{1}{8} + \frac{6}{8} - \frac{5}{8} = \frac{1+6-5}{8} \Rightarrow \frac{1}{4} = 0.25$

Sol.744.(d)

$79 - [23 - \{84 \div 7 - (16 - 16 \div 4) \div 4\}]$

$= 79 - [23 - \{12 - (16 - 4) \div 4\}]$

$= 79 - [23 - \{12 - 12 \div 4\}]$

$= 79 - [23 - \{12 - 3\}]$

$= 79 - [23 - 9] = 79 - 14 = 65$

Sol.745. (d) $\left(\left(4^4\right)^2 \times \frac{1}{64^2}\right)^2 + 10$

$\Rightarrow \left(\left(4^8\right) \times \frac{1}{4^6}\right)^2 + 10$

$\Rightarrow \left(4^2\right)^2 + 10 \Rightarrow \left(4^4\right) + 10 = 266$

Sol.746.(c) $\sqrt{16.81} + \sqrt{67.24} \div 2$

$\Rightarrow 4.1 + 8.2 \div 2 \Rightarrow 4.1 + 4.1 = 8.2$

Sol.747.(d) $5 \div 5^{-2} + \sqrt{25} - \sqrt{121}$

$5 \div \frac{1}{5^2} + 5 - 11$

$\Rightarrow 5 \times 5^2 - 6 \Rightarrow 125 - 6 = 119$

Sol.748.(b)

$\frac{1}{10} \div \frac{1}{10} \div \frac{1}{10} \div \frac{1}{10} \div \frac{1}{10}$

$= \frac{1}{10} \times 10 \times 10 \times 10 \times 10 \Rightarrow 1000$

Sol.749.(d) $\left(\left(6^4\right)^2 \times \frac{1}{216^2}\right) \times 6 + 16$

$\Rightarrow \left(6^8 \times \frac{1}{6^6}\right) \times 6 + 16$

$\Rightarrow \left(6^2\right) \times 6 + 16 \Rightarrow 6^3 + 16 \Rightarrow 232$

Sol.750.(d) $6 \div 6^{-2} + \sqrt{36} - \sqrt{144}$

$\Rightarrow 6 \div \frac{1}{6^2} + 6 - 12$

$\Rightarrow 6 \times 6^2 - 6 \Rightarrow 216 - 6 = 210$

Sol.751.(c)

$\frac{2}{5}(x) + \frac{3}{10}(x) - \frac{3}{5}(x) = 531$

$\frac{4x+3x-6x}{10} = 531$

$\frac{x}{10} = 531 \Rightarrow x = 5310$

Sol.752.(c) $\sqrt{441} \div 21 + \sqrt{484} = 1 \times x$

$21 \div 21 + 22 = x \Rightarrow x = 23$

Sol.753.(a)

$\frac{1}{13} \div \frac{1}{13} \div \frac{1}{13} \div \frac{1}{13} \div \frac{1}{13}$

$\Rightarrow \frac{1}{13} \times 13 \times 13 \times 13 \times 13 = 2197$

Sol.754.(b) $\left(\left(8^4\right)^2 \times \frac{1}{512^2}\right) \times 8 + 18$

$\Rightarrow \left(8^8 \times \frac{1}{8^6}\right) \times 8 + 18$

$\Rightarrow \left(8^2\right) \times 8 + 18 \Rightarrow 8^3 + 18 \Rightarrow 530$

Sol.755.(b) $\sqrt{21.16} + \sqrt{79.21} + 8.9$

$\Rightarrow 4.6 + 8.9 + 8.9 \Rightarrow 22.4$

Sol.756.(c)

$12.34 + 23.45 + 34.56 - 45.67 = 2 \times ?$

$35.79 + 34.56 - 45.67 = 2 \times ?$

$70.35 - 45.67 = 2 \times ?$

$24.68 = 2 \times ?$

$? = 12.34$

Sol.757.(d)

$(169)^2 \times 52 \div 13^5 \times 1020 = ?$

$\left(13^2\right)^2 \times 52 \div 13^5 \times 1020 = ?$

$13^4 \times 52 \times \frac{1}{13^5} \times 1020 = ?$

$52 \times \frac{1}{13} \times 1020 = ?$

$? = 4080$

Sol.758.(d) $\sqrt{169} \div 13 + \sqrt{196} = 3 \times x$

$13 \div 13 + 14 = 3x \Rightarrow x = 5$

Sol.759.(a)

The square root of 15376 = 124

Sol.760.(a) The reducible fraction among the given fractions is $\frac{105}{112} = \frac{15}{16}$

Sol.761.(d) $-\frac{1}{4}\{-45-(-96)\div(-32)\}$

$\Rightarrow -\frac{1}{4}\{-45-3\} \Rightarrow -\frac{1}{4}\times(-48) = 12$

Sol.762.(b) Let the fraction be x
ATQ,
$x + \frac{5}{8} = 1 \Rightarrow x = 1 - \frac{5}{8} = \frac{3}{8}$ or $\frac{6}{16}$

Sol.763.(a)

$22 - (\frac{1}{4})\{-5 - (-48) \div (-16)\}$

$= 22 - (\frac{1}{4})\{-5-3\}$

$\Rightarrow 22 - (\frac{1}{4}) \times (-8) = 22 - (-2) = 24$

Sol.764.(b) The given fraction is :
$\frac{4}{56} = 0.\overline{0714285}$, $\frac{7}{56} = 0.125$,
$\frac{6}{56} = 0.10\overline{714285}$, $\frac{8}{56} = 0.\overline{142857}$
Clearly, we can see that $\frac{7}{56}$ will not lead to a recurring decimal.

Sol.765.(b)

5	3249	57
5	25	
107	749	
	749	
	0	

So, square root of 3249 = 57

Sol.766.(c) $(-4)\{19 - (-2) \times (-8)\}$
$\Rightarrow (-4)\{19 - 16\} \Rightarrow -4 \times 3 = -12$

Sol.767.(d)
On observing the given options ,
we can clearly see that 441 i.e.21^2 is a perfect square

Sol.768.(b) Let the required decimal be x
ATQ,
1.6x = 0.768
$x = \frac{0.768}{1.6} = 0.48$

Sol.769.(b) Let the other no be x
ATQ,
$1.6x = 0.432 \Rightarrow x = \frac{0.432}{1.6} = 0.27$

Sol.770.(c) Let the required fraction be x
ATQ,
$x - \frac{4}{7} = \frac{5}{6} - x$
$2x = \frac{5}{6} + \frac{4}{7} = \frac{35+24}{42} = \frac{59}{42}$
$x = \frac{59}{42 \times 2} = \frac{59}{84}$

Sol.771.(b)
A = (-14 + 4) = -10 and B = 4 - 14 = -10
AB = -10 × (-10) = 100

Sol.772.(b) Let the required no be x
ATQ,
$x \times 6\frac{2}{9} = 40 \Rightarrow x \times \frac{56}{9} = 40$
$x = \frac{40\times9}{56} = \frac{45}{7} = 6\frac{3}{7}$

Sol.773.(b) Since, 1000 meter = 1 km
Then, 1 meter = $\frac{1}{1000}$ = 0.001 km

Sol.774.(a) 170 x 0.029 = 4.93

Sol.775.(b)
The square root of 27225 = 165

1	27225	165
1	1	
26	172	
6	156	
325	1625	
	1625	
	0	

Sol.776.(d) We have following fraction:
$\frac{3}{36} = 0.08\overline{3}$, $\frac{6}{36} = 0.1\overline{6}$, $\frac{12}{36} = 0.\overline{3}$,
$\frac{9}{36} = 0.25$
Clearly, we can see that $\frac{9}{36}$ will give a terminating decimal.

Sol.777.(d)
$\{38 - (60 \div 5 \times \overline{16-8} \div 2 \div 3)\}$
$= \{38 - (12 \times 8 \div 2 \div 3)\}$
$= \{38 - 12 \times 8 \times \frac{1}{6}\} \Rightarrow \{38 - 16\} = 22$

Sol.778.(d)
The square root of 5329 is 73.

7	5329	73
7	49	
143	429	
	429	
	0	

Sol.779.(d) Let the other number be = x
ATQ,
$x \times 1.2 = 0.324 \Rightarrow x = \frac{0.324}{1.2} = 0.27$

Sol.780.(c) Reciprocal of $\frac{13}{5} = \frac{5}{13}$

Sol.781.(d) Let the other no be x
ATQ,
$\Rightarrow 2.50 \times x = 40 \Rightarrow x = \frac{40}{2.50} = 16$

Sol.782.(a)
$45 - [38 - \{60 \div 3 - (6 - 9 \div 3) \div 3\}]$
$= 45 - [38 - \{20 - (6 - 3) \div 3\}]$
$= 45 - [38 - \{20 - 3 \div 3\}]$
$= 45 - [38 - \{20 - 1\}]$
$= 45 - [38 - 19] \Rightarrow 45 - 19 = 26$

Sol.783.(d) 0.0713 ÷ 3.1 = 0.023

Sol.784.(a) Let the weight of brick be x
ATQ,
$\frac{3}{4}x = \frac{7}{8} \Rightarrow x = \frac{7}{8} \times \frac{4}{3} = \frac{7}{6}$
So, $\frac{5}{7}$ of $\frac{7}{6} = \frac{5}{6}$kg

Sol.785.(d) Let the fraction be x
ATQ,
$\frac{1}{3} - x = \frac{1}{12}$
$x = \frac{1}{3} - \frac{1}{12} = \frac{4-1}{12} = \frac{3}{12} = \frac{1}{4}$

Sol.786.(a) $11111^2 = 123454321$

Sol.787.(b)
$23 - [24 - \{25 - (26 - \overline{27 - 28})\}]$
$\Rightarrow 23 - [24 - \{25 - (26 + 1)\}]$
$\Rightarrow 23 - [24 - \{25 - 27\}]$
$\Rightarrow 23 - [24 + 2] = -3$

Sol.788.(d)
$25 - \frac{1}{2}\{5 + 4 - (3 + 2 - 1 + 3)\}$
$\Rightarrow 25 - \frac{1}{2}\{9 - 7\}$
$\Rightarrow 25 - \frac{1}{2} \times 2 = 25 - 1 = 24$

Sol.789.(b) $\frac{4}{5} + \frac{4}{7} = 4(\frac{1}{5} + \frac{1}{7})$
$= 4 \times (\frac{7+5}{35}) = \frac{48}{35} = 1\frac{13}{35}$

Sol.790.(d) Let the number be x
ATQ,
$\Rightarrow x + \frac{2}{3} = \frac{3}{2} \Rightarrow x = \frac{3}{2} - \frac{2}{3} \Rightarrow x = \frac{5}{6}$

Sol.791.(d) In order to solve the question,
we have to find the closest perfect square to 435.
$20^2 = 400 \Rightarrow 21^2 = 441$
Clearly, we can see that 6 i.e.(441 - 435) is the required no which should be added to 435 .

Sol.792.(d) The square root of 576 = 24

2	576	24
2	4	
44	176	
	176	
	0	

Sol.793.(a) $\sqrt{0.9} = 0.9487$

Sol.794.(b)
$24 - [25 - \{26 - (27 - \overline{28 - 29})\}]$
$= 24 - [25 - \{26 - (27 - (-1))\}]$
$= 24 - [25 - \{26 - 28\}]$

= 24 - [25 + 2] = 24 - 27 = -3

Sol.795.(d) 1.004 - 0.4 = 0.604

Sol.796.(d) $\frac{60}{75} = \frac{4}{x} \Rightarrow x = \frac{75 \times 4}{60} = 5$

Sol.797.(c) Let the no be x
ATQ,
$\Rightarrow 1.25x = 20 \Rightarrow x = \frac{20}{1.25} = 16$

Sol.798.(d)
46% of 250 = $\frac{250 \times 46}{100} = 115$

Sol.799.(b)
$0.02\overline{245} = \frac{245 - 2}{9900} = \frac{243}{9900} = \frac{27}{1100}$

Sol.800.(d) 23 - [23 - {23 - (23 - 23 + 23)}]
= 23 - [23 $-\{23 - 23\}$]
$\Rightarrow$ 23 - [23 $-$ 0] = 23 - 23 = 0

Sol.801.(a) 0.0437 ÷ 1.9
$= \frac{0.0437}{1.9} = \frac{437 \times 10}{19 \times 10000}$
$= \frac{23 \times 19 \times 10}{19 \times 10000}$ **.....** (23 x 19 = 437)
$= \frac{23}{1000} = 0.023$

Sol.802.(c) $25 \div \frac{1}{5} = 25 \times 5 = 125$

Sol.803.(b)
$4 + (\frac{1}{6})[\{-10 \times (25 - 13 - 3)\} \div (-5)]$
$= 4 + (\frac{1}{6})[\{-10 \times 9\} \div (-5)]$
$= 4 + (\frac{1}{6})[-90 \div (-5)]$
$\Rightarrow 4 + (\frac{1}{6}) \times 18 = 4 + 3 = 7$

Sol.804.(d)
[63 - (- 3) {- 2 - 8 - 3}] ÷ 3{6 + (- 2) (- 1)}
$\Rightarrow$ [63 - (- 3) × (- 13)] ÷ 3{ 6 + 2}
$\Rightarrow [63 - 39] \div 24 = 24 \div 24 = 1$

Sol.805.(b) $2 + 5 \div [5 + 8 \div (1 + \frac{1}{3}) - 1]$
$\Rightarrow 2 + 5 \div [5 + 8 \div \frac{4}{3} - 1]$
$\Rightarrow 2 + 5 \div [5 + 6 - 1]$
$\Rightarrow 2 + 5 \div 10 = 2 + \frac{1}{2} = \frac{5}{2}$

Sol.806.(d) 56% of 375 is
$= \frac{14}{25} \times 375 = 210$

Sol.807.(b)
58% of 350 = $\frac{29}{50} \times 350 = 203$

Sol.808.(d) $8 \times \{5 - (-2) \times (-3)\}$
$= 8 \times \{5 - 6\} \Rightarrow 8 \times -1 = -8$

Sol.809.(d) 122 + 345 - 3 ÷ 1116 × 372
$\Rightarrow$ 122 + 345 - 1 = 467 - 1 = 466

Sol.810.(d)
Let the required fraction be x
ATQ,
$x + \frac{7}{3} = 4 \Rightarrow x = 4 - \frac{7}{3} = \frac{5}{3} = 1\frac{2}{3}$

Sol.811.(c) Required fraction = $1 - \frac{5}{7}$
$= \frac{7-5}{7} = \frac{2}{7}$ or $\frac{6}{21}$

Sol.812.(a) Let the required no be x
ATQ,
18% of 60 = 54% of x
$1080 = 54x \Rightarrow x = \frac{1080}{54} = 20$

Sol.813.(a) Square root of 16384
$= \sqrt{16384} = \sqrt{256 \times 64} = 16 \times 8 = 128$

Sol.814.(a) On solving all the option one by one we get,
(a) $\frac{108}{221} \neq \frac{9}{17}$ (b) $\frac{27}{51} = \frac{9}{17}$
(c) $\frac{63}{119} = \frac{9}{17}$ (d) $\frac{153}{289} = \frac{9}{17}$

Sol.815.(b) $\frac{(0.2)^3 - (0.1)^3}{(0.2 + 0.1)^2}$
$= \frac{(0.2 - 0.1)(0.04 + 0.01 + 0.02)}{(0.2 + 0.1)(0.2 + 0.1)}$
$= \frac{0.1 \times 0.07}{0.3 \times 0.3} = \frac{0.007}{0.09} = \frac{7}{90}$

Sol.816.(b) $\frac{(0.3)^3 + (0.2)^3}{(0.3 - 0.2)^2}$
$\frac{(0.3 + 0.2)(0.09 + 0.04 - 0.06)}{0.1 \times 0.1}$
$= \frac{0.5 \times 0.07}{0.01} = 3.5 \text{ or } \frac{7}{2}$

Sol.817.(d) $|3(1) - 6|$
$= |3 - 6| = |-3| = 3$

Sol.818.(d)
$\sqrt{93 + \sqrt{32 + \sqrt{274 + \sqrt{225}}}}$
$= \sqrt{93 + \sqrt{32 + \sqrt{274 + 15}}}$
$= \sqrt{93 + \sqrt{32 + \sqrt{289}}}$
$= \sqrt{93 + \sqrt{32 + 17}}$
$= \sqrt{93 + \sqrt{49}} \Rightarrow \sqrt{93 + 7} = \sqrt{100} = 10$

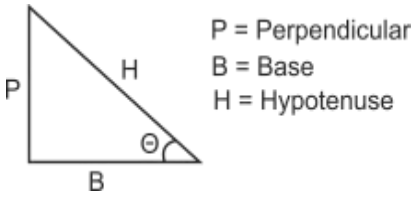
Sol.819.(d) (5x - 3) (x + 4) - (2x + 5)(3x - 4)
= ($5x^2$ + 20x - 3x - 12) - ($6x^2$ - 8x + 15x - 20)
= $5x^2$ + 20x - 3x - 12 - $6x^2$ + 8x - 15x + 20
= $-x^2$ + 10x + 8

Trigonometry

It is that branch of Mathematics which deals with the measurements of the sides and angles of a triangle and also the problems associated with angles.

Important Formulae

In a right angled triangle, as shown below



- $\sin\theta = \frac{P}{H}$ • $cosec\theta = \frac{H}{P}$
- $\cos\theta = \frac{B}{H}$ • $\sec\theta = \frac{H}{B}$
- $\tan\theta = \frac{P}{B}$ • $\cot\theta = \frac{B}{P}$

Note that

$cosec\theta = \frac{1}{\sin\theta}$, $\therefore cosec\theta \times \sin\theta = 1$

Similarly, $\sec\theta = \frac{1}{\cos\theta}$

$\therefore \sec\theta \times \cos\theta = 1$

And, $\cot\theta = \frac{1}{\tan\theta}$

$\therefore \cot\theta \times \tan\theta = 1$

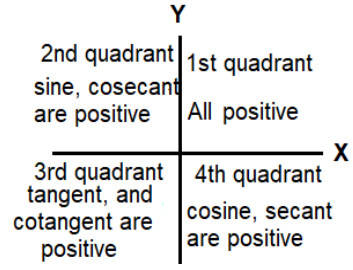
Also, $\tan\theta = \frac{Sin\,\theta}{Cos\,\theta}$

- sinθ = cos (90° - θ)
- cosecθ = sec (90° - θ)
- tanθ = cot (90° - θ)

Conversion of trigonometric ratios

- sin (-x) = - sin x
- cosec (-x) = - cosec x
- cos (-x) = cos x
- sec (-x) = sec x
- tan (- x) = - tan x
- cot (- x) = - cot x

Signs of the trigonometric ratios in different quadrants :



• x axis ± θ → no change
• y axis ± θ → changes like
sinθ ↔ $cos\theta$
tanθ ↔ $cot\theta$
cosecθ ↔ $sec\theta$

Important Identities

- $sin^2\theta + cos^2\theta = 1$
- $sec^2\theta - tan^2\theta = 1$
- $cosec^2\theta - cot^2\theta = 1$

We can derive all other identities from these three basic identities.

Values of Trigonometric functions for different values of θ.

	0^0	30^0	45^0	60^0	90^0
	$\sqrt{\frac{0}{4}}$	$\sqrt{\frac{1}{4}}$	$\sqrt{\frac{2}{4}}$	$\sqrt{\frac{3}{4}}$	$\sqrt{\frac{4}{4}}$
$sin\theta$	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
$cos\theta$	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
$tan\theta$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	$\propto$
$cot\theta$	$\propto$	$\sqrt{3}$	1	$\frac{1}{\sqrt{3}}$	0
$sec\theta$	1	$\frac{2}{\sqrt{3}}$	$\sqrt{2}$	2	$\propto$
$cosec\theta$	$\propto$	2	$\sqrt{2}$	$\frac{2}{\sqrt{3}}$	1

The value of sinθ or cosθ never exceeds 1, whereas the value of secθ or cosecθ is always greater than or equal to 1.

Range of all trigonometric functions

	Minimum	Maximum
Sinx,cosx (odd powers)	-1	+ 1
Sinx,cosx (even powers)	0	+1
Tanx,cotx (odd powers)	-∞	+∞
Tanx,cotx (even powers)	0	+∞
Secx,cosecx (odd powers)	-∞	+∞
Secx,cosecx (even powers)	+1	+∞

Maximum and Minimum value of the trigonometric expressions of the different form

• a sinx ± $b\,cosx$
Maximum value = $\sqrt{a^2 + b^2}$
Minimum value = $-\sqrt{a^2 + b^2}$

• asin^2x + bcos^2x
If, a > b Maximum value = a
Minimum value = b
If a < b Maximum value = b
Minimum value = a

• a $cosec^2x$ + b sec^2x
Maximum value = ∞
Minimum value = $(\sqrt{a} + \sqrt{b})^2$

• a sin^2x + b $cosec^2x$

• a tan^2x + b cot^2x

• a cos^2x + b sec^2x
Maximum and Minimum value of these three trigonometric expression is ∞ and $2\sqrt{ab}$ respectively.

• $sin^{2n}x + cos^{2m}x$
Maximum value = 1
Minimum value = (use m = n = 45°)

Example : Find the minimum and maximum value of $sin^2x + cos^4x$?
Maximum value of $sin^2x + cos^4x$ = 1
Minimum value = $sin^2 45° + cos^4 45°$ = $\frac{1}{2} + \frac{1}{4} = \frac{3}{4}$

• $(\sin x \cos x)^n$
Maximum value = ∞
Minimum value = $(\frac{1}{2})^n$

Example : Find the minimum value of $sin^4x\,cos^4x$?
Minimum value = $(\frac{1}{2})^4 = \frac{1}{16}$

Compound Formulae

- $sin\,(A + B) = sin\,A.cos\,B + cos\,A.sin\,B$
- $sin\,(A - B) = sin\,A\,.cos\,B - cos\,A.sin\,B$
- $cos\,(A + B) = cosA.cosB - sinA.sinB$
- $cos\,(A - B) = cosA\,.cosB + sinA.sin\,B$
- sin 2A = 2 sin A cos A $= \frac{2\tan A}{1 + tan^2A}$
- cos 2A = $cos^2A - sin^2A$ $= 1 - 2sin^2A$
- cos2A = $\frac{1 - tan^2A}{1 + tan^2A}$ $= 2cos^2A - 1$
- Tan 2A = $\frac{2tanA}{1 - tan^2A}$
- sin 3A = 3sinA − $4sin^3A$
- cos 3A = $4cos^3A - 3cosA$
- $tan\,3A = \frac{3\tan A - tan^3A}{1 - 3tan^2A}$
- $sin\,\theta\,.sin\,2\theta\,.sin\,4\theta = \frac{1}{4}sin\,3\theta$
- $cos\,\theta\,.cos\,2\theta\,.cos\,4\theta = \frac{1}{4}cos\,3\theta$
- $tan\theta.tan2\theta.tan4\theta = tan3\theta$
- Tan(A + B) = $\frac{tanA + tanB}{1 - (tanA \times tanB)}$
- Tan(A - B) = $\frac{tanA - tanB}{1 + (tanA \times tanB)}$
- Cot (A + B)= $\frac{cotB\,cotA - 1}{cotB + cotA}$
- Cot (A - B) = $\frac{cotB\,cotA + 1}{cotB - cotA}$

Transformations of sums or differences into products

- sin C + sin D = 2 sin$\frac{C+D}{2}$ cos$\frac{C-D}{2}$
- sin C - sin D = 2 cos$\frac{C+D}{2}$ sin$\frac{C-D}{2}$
- cos C + cos D = 2 cos$\frac{C+D}{2}$ $cos\frac{C-D}{2}$
- cos C - cos D = - 2 sin$\frac{C+D}{2}$ sin$\frac{C-D}{2}$

Concepts

● a sinX + b cosX = m
a cosX - b sinX = n
Then, $a^2 + b^2 = m^2 + n^2$

Example : if 3 sinθ + 5 $cos\theta$ = 5.
Find the value of 3 cosθ − 5 sinθ ?

3 cosθ − 5 sinθ = $\sqrt{5^2 + 3^2 - 5^2}$ =± 3

● a secX + b tanX = m
a tanX - b secX = n
Then, $a^2 - b^2 = m^2 - n^2$
If secx and tanx are replaced by cosecx and cotx respectively . Then the outcome will be the same.

Example: if 29 secθ + 21 $tan\theta$ = 20
Find the value of 29 tanθ − 21 $sec\theta$?
Sol:-- = 29 $tan\theta$ − 21 $sec\theta$
= $\sqrt{20^2 - 29^2 + 21^2}$ = 0

● sec x + tan x = $\frac{1}{sec\,x - tan\,x}$

● cosec x + cot x = $\frac{1}{cosec\,x - cot\,x}$

Some Important results

(i). If A + B + C = 180°. then,
● tanA + tanB + tanC = tanA tanB tan C
● cotA cotB + cotB cotC + cotC cotA = 1

(ii). If A + B + C = 90°. then,
● tanA tanB + tanB tanC + tanC tanA = 1
● cotA + cotB + cotC = cotA cotB cotC

(iii). If A + B = 45°. then
● (1 + tanA) (1 + tanB) = 2
● (1 - cotA) (1 - cotB) = 2

Variety Questions

Q.1. If sec 4A = cosec (3A - 50°), where 4A and 3A are acute angles, find the value of A + 75.
Group D 18/08/2022 (Afternoon)
(a) 95° (b) 105° (c) 78° (d) 67°

Q.2. The value of
$\frac{Sin^2 10° + Sin^2 20° + Sin^2 30° + Sin^2 40° + Sin^2 50°}{cos^2 20° + cos^2 40° + cos^2 50° + cos^2 70° + cot^2 45°} + \frac{Sin^2 60° + Sin^2 70° + Sin^2 80° + Sin^2 90°}{cos^2 20° + cos^2 40° + cos^2 50° + cos^2 70° + cot^2 45°}$
Group D 22/08/2022 (Afternoon)
(a) $\frac{3}{4}$ (b) $\frac{5}{3}$ (c) $\frac{6}{5}$ (d) $\frac{4}{3}$

Q.3. The value of
$\frac{1}{(1+cot^2 x)^2} + \frac{tan^2 x}{(1+tan^2 x)^2} + \frac{1}{1+tan^2 x}$
is:
Group D 22/08/2022 (Evening)
(a) 4 (b) 5 (c) 3 (d) 1

Q.4. If tanθ = 4, then the value of $\frac{4\cos\theta + 2\sin\theta}{2\sin\theta - \cos\theta}$ is :
Group D 23/08/2022 (Afternoon)
(a) $\frac{12}{5}$ (b) $\frac{12}{7}$ (c) $\frac{12}{8}$ (d) $\frac{12}{10}$

Q.5. Find the value of $\frac{sin^2\theta - sin^4\theta + 1}{1 - sin^2\theta}$
+ $\frac{1 - tan^2\theta - tan^4\theta}{1 + tan^2\theta}$
Group D 24/08/2022 (Evening)
(a) 1 (b) - 1 (c) 0 (d) 2

Q.6. Find the value of
$2 - \frac{sin^2\alpha}{1-cos\alpha} + \frac{1-cos\alpha}{sin\alpha} - \frac{sin\alpha}{1+cos\alpha}$
Group D 26/08/2022 (Evening)
(a) 1 - sin α (b) 1 - cosα
(c) 1 + sinα (d) 1 + cosα

Q.7. If $cos^4\theta - sin^4\theta = k$, then the value of $\frac{1+k}{1-k}$ is :
Group D 29/08/2022 (Afternoon)
(a) $cot^2\theta$ (b) $tan^2\theta$ (c) $cosec^2\theta$ (d) $sin^2\theta$

Q.8. If sinθ > cosθ, then the value of $\frac{\sqrt{1-2sin\theta cos\theta} + \sqrt{1+2sin\theta cos\theta}}{2tan\theta}$ is :
Group D 29/08/2022 (Evening)
(a) tanθ (b) cotθ (c) cosθ (d) sinθ

Q.9. If x = (sec θ - cos θ)(cot θ + tan θ) and y = secθ(sec θ + tan θ)(1 − sinθ), 0° < θ < 90 °, then xy is equal to:
Group D 02/09/2022 (Morning)
(a) tanθ secθ (b) cot θ
(c) sin θ (d) cosecθ cotθ

Q.10. $\frac{sin\theta\,(1+cos\theta)}{1+cos\theta - sin^2\theta}$× (secθ + tanθ)
(1 - sinθ), 0° < θ < 90°, is equal to :
Group D 05/09/2022 (Afternoon)
(a) cosθ (b) cosecθ (c) secθ (d) sinθ

Q.11. If 7sin² x + 3 cos²x = 4,and x is acute angle, than value of cot× + tanx will be:
Group D 09/09/2022 (Evening)
(a) $\frac{5}{\sqrt{3}}$ (b) $\frac{2}{\sqrt{3}}$ (c) $\frac{4}{\sqrt{3}}$ (d) $\frac{7}{\sqrt{3}}$

Q.12. $\frac{(sin\,70° - 2\,sin^3\,70°)}{(2\,cos^3\,70° - cos\,70°)}$ is equal to:
Group D 12/09/2022 (Evening)
(a) tan 70° (b) cosec 70°
(c) sec 70° (d) cot 70°

Q.13. If cosθ = $\frac{X}{sin\theta}$ then the value of sin⁶θ + cos⁶ θ = _____.
Group D 14/09/2022 (Morning)
(a) 1 - 3x² (b) 0 (c) 3x² - 1 (d) 1

Q.14. If a secA + b tanA + c = 0 and a'secA + b'tanA + c' = 0 then $(bc' - b'c)^2 - (ca' - c'a)^2$ is equal to:
Group D 19/09/2022 (Afternoon)
(a) (ab + a'b')² (b) (a'b + ab')²
(c) (ab - a'b')² (d) (ab' - a'b)²

Q.15. The value of $\frac{Sin\,A - Sin\,B}{Cos\,A + Cos\,B}$ + $\frac{Cos\,A - Cos\,B}{Sin\,A + Sin\,B}$ is
Group D 20/09/2022 (Evening)
(a) 2 (b) 0 (c) − 1 (d) 1

Q.16. Given $asinq = bcosq$ and $asin^3 q + bcos^3 q = sinq\,cosq$, 0 < q < 90°, find the value of $a^2 + b^2$.
Group D 26/09/2022 (Morning)
(a) 0 (b) 1 (c) 3 (d) 2

Q.17. If p sin²β + q cos²β = r , then the value of cot² ß is:
Group D 27/09/2022 (Morning)
(a) $\frac{r-q}{r-p}$ (b) $\frac{r-p}{r-q}$ (c) $\frac{p-r}{r-q}$ (d) $\frac{r-q}{p-r}$

Q.18. The value of $(sin\theta + cosec\theta)^2$ + $(cos\theta + sec\,\theta)^2$ is
Group D 27/09/2022 (Afternoon)
(a) 7 − $cot^2\theta$ + $tan^2\theta$
(b) 5 + $cot^2\theta$ + $tan^2\theta$
(c) 7 + $cot^2\theta$ + $tan^2\theta$
(d) 5 − $cot^2\theta$ + $tan^2\theta$

Q.19. The value of
cosec(47°+ θ) − sec(43° − θ) + tan(61° + θ) −cot(29°− θ) + sin(45° + θ) −cos (45°− θ) is equal to:
Group D 29/09/2022 (Morning)
(a) 0 (b) $\frac{1}{\sqrt{2}}$ (c) 1 (d) $\frac{\sqrt{3}}{2}$

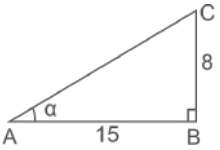
Q.20. If θ is an acute angle, and $cos\theta = \frac{12}{13}$, then the value of $\frac{13\,sin\,\theta + 12\,sec\,\theta}{12\,tan\,\theta + 5\,cosec\,\theta}$ is:
Group D 29/09/2022 (Evening)
(a) 1 (b) $\frac{1}{2}$ (c) 2 (d) $\frac{3}{2}$

Q.21. If $sin^2x + 3cos^2x = 2$, and (0° < x < 90°), find the value of $cosec\ x$.
Group D 30/09/2022 (Morning)
(a) $\sqrt{3}$ (b) 2 (c) $\frac{2\sqrt{3}}{3}$ (d) $\sqrt{2}$

Q.22. The value of
$\frac{505}{cot^2\theta} - \frac{505}{cos^2\theta} + \frac{15tan\,\theta\,cos\,\theta}{sin\,\theta}$
Group D 06/10/2022 Evening)
(a) − 520 (b) 520 (c) 490 (d) − 490

Q.23. secθ + tanθ = p, then find 4secθ.
Group D 07/10/2022 (Morning)
(a) $\frac{2(1-p^2)}{p}$ (b) $\frac{2(1+p^2)}{p}$
(c) $\frac{(1+p^2)}{2p}$ (d) $\frac{(1+p^2)}{p}$

Q.24.



In the given right-angled triangle, where the lengths of the sides given are 15cm and 8cm, find the value of cos α + cot α
Group D 11/10/2022 (Evening)
(a) $\frac{333}{136}$ (b) $\frac{375}{136}$ (c) $\frac{15}{17}$ (d) $\frac{19}{8}$

Q.25. If sin $2\mathcal{X}$ = cos 60° cos 30° + sin 60° sin 30°, then which of the following is a possible value of tan$\mathcal{X}$ + sec$\mathcal{X}$?
(0 < $\mathcal{X}$ < 90°)
NTPC CBT II Level 5 (12/06/2022) Shift 2
(a) $\frac{\sqrt{3}}{2}$ (b) $\frac{3\sqrt{3}}{2}$ (c) $\frac{\sqrt{3}}{4}$ (d) $\sqrt{3}$

Q.26. The value of 5sin14°sec76° + 3cot 15°cot75° + 2tan45° is :
NTPC CBT - I 28/12/2020 (Morning)
(a) 1 (b) 8 (c) 10 (d) 0

Q.27. Evaluate: cos20°cos40°cos80°.
NTPC CBT - I 29/12/2020 (Morning)
(a) $\frac{1}{2}$ (b) $\frac{1}{32}$ (c) $\frac{1}{8}$ (d) $\frac{1}{4}$

Q.28. 2(sin⁶θ + cos⁶θ) - 3(sin⁴θ + cos⁴θ) is equal to :
NTPC CBT - I 30/12/2020 (Evening)
(a) 1 (b) - 1 (c) 3 (d) 2

Q.29. If secθ = 5x and tanθ = $\frac{5}{x}$, then the value of 10(x^2 - $\frac{1}{x^2}$) is :
NTPC CBT - I 04/01/2021 (Evening)
(a) 2 (b) $\frac{2}{5}$ (c) $\frac{1}{5}$ (d) $\frac{3}{5}$

Q.30. The value of sin15° is :
NTPC CBT - I 05/01/2021 (Morning)
(a) $\frac{\sqrt{3}-1}{2\sqrt{2}}$ (b) $\frac{1}{\sqrt{2}}$
(c) $\frac{\sqrt{3}-1}{\sqrt{3}+1}$ (d) $\frac{\sqrt{3}+1}{2\sqrt{2}}$

Q.31. In any triangle ABC , a + b + c = 2s with usual notation, then sin($\frac{A}{2}$) = ?
NTPC CBT - I 07/01/2021 (Evening)
(a) $\sqrt{\frac{(s-c)(s-a)}{ac}}$ (b) $\sqrt{\frac{(s-b)(s-c)}{bc}}$
(c) $\sqrt{\frac{(s-b)(s-c)}{s(s-a)}}$ (d) $\sqrt{\frac{s(s-a)}{bc}}$

Q.32. Value of A for the equation: tanA + tan2A + tan3A = tanAtan2Atan3A is :
NTPC CBT - I 07/01/2021 (Evening)
(a) $\frac{5\pi}{6}$ (b) $\frac{\pi}{3}, \frac{2\pi}{3}$ (c) $\frac{2\pi}{3}$ (d) $\frac{\pi}{3}$

Q.33. If A , B and C are the interior angles of a Δ ABC , simplify.
$\frac{cos^2(\frac{B+C}{2}) + cos^2\frac{A}{2}}{sec^2\frac{C}{2} - cot^2(\frac{A+B}{2})}$
NTPC CBT - I 10/01/2021 (Morning)
(a) 1 (b) 2 (c) 0 (d) Not defined

Q.34. If x = rsinAcosC , y = rsinAsinC , and z = rcosA , then find the value of $x^2 + y^2 + z^2$.
NTPC CBT - I 11/01/2021 (Morning)
(a) r^2 (b) 2r (c) $2r^2$ (d) 0

Q.35. If sin(A + B) = $\frac{\sqrt{3}}{2}$ and cos(A - B) = $\frac{\sqrt{3}}{2}$, then which of the following will be possible values of A and B ?
NTPC CBT - I 12/01/2021 (Morning)
(a) A = 10°, B = 45° (b) A = 50°, B = 10°
(c) A = 45°, B = 30° (d) A = 45°, B = 15°

Q.36. If sin(3x - 20)° = cos(20 - 3y)° , then value of x - y will be :
NTPC CBT - I 12/01/2021 (Evening)
(a) 20° (b) 60° (c) 30° (d) 45°

Q.37. If acosθ − $bsin\theta$ = c , then find the value of asinθ + $bcos\theta$.
NTPC CBT - I 16/01/2021 (Morning)
(a) $\sqrt{a^2 + b^2 + c^2}$ (b) $\pm\sqrt{a^2 + b^2 - c^2}$
(c) $\sqrt{b^2 + c^2 - a^2}$ (d) $\pm\sqrt{a^2 + c^2 - b^2}$

Q.38. What is the value of the following expressions ?
$\frac{1 + sec\theta + tan\theta}{1 + sec\theta - tan\theta}$
NTPC CBT - I 18/01/2021 (Evening)
(a) $\frac{1 - tan\frac{\theta}{2}}{tan\frac{\theta}{2}}$ (b) $\frac{1 - tan\frac{\theta}{2}}{1 + tan\frac{\theta}{2}}$
(c) $\frac{1 + tan\frac{\theta}{2}}{1 - tan\frac{\theta}{2}}$ (d) $\frac{1 + tan\frac{\theta}{2}}{tan\frac{\theta}{2}}$

Q.39. The value of 4cos($\frac{\pi}{6}$ - α)sin($\frac{\pi}{3}$ - α) is equal to :
NTPC CBT - I 18/01/2021 (Evening)
(a) 3 + sin²α (b) 3 + 4sin²α
(c) 3 - sin²α (d) 3 - 4sin²α

Q.40. If tanθ = x - $\frac{1}{4x}$, then secθ - tanθ is equal to :
NTPC CBT - I 19/01/2021 (Morning)
(a) 2x or $\frac{1}{2x}$ (b) 2x or - $\frac{2}{2x}$
(c) - 2x or - $\frac{1}{2x}$ (d) - 2x or $\frac{1}{2x}$

Q.41. 1 + tan15° cot75° is equal to:
NTPC CBT - I 20/01/2021 (Morning)
(a) $sec^2 15°$ (b) $cosec^2 15°$
(c) $cos^2 15°$ (d) $sin^2 15°$

Q.42. If 3x = cosecθ and $cot\theta = \frac{3}{x}$ then the value of 9($x^2 - \frac{1}{x^2}$) is :
NTPC CBT - I 23/01/2021 (Morning)
(a) 1 (b) $\frac{1}{3}$ (c) 0 (d) $\frac{1}{9}$

Q.43. The principal value of $cot^{-1}(\frac{-1}{\sqrt{3}})$ is
NTPC CBT - I 29/01/2021 (Morning)
(a) $\frac{\pi}{6}$ (b) $\frac{5\pi}{6}$ (c) $\frac{3\pi}{2}$ (d) $\frac{\pi}{3}$

Q.44. The minimum value of 4sin²θ + 5cos²θ is :
NTPC CBT - I 29/01/2021 (Evening)
(a) 0 (b) 2 (c) 4 (d) 1

Q.45. Angle 54° is equivalent to (in radians) :
NTPC CBT - I 04/02/2021 (Evening)
(a) $\frac{9\pi}{10}$ (b) $\frac{7\pi}{10}$ (c) $\frac{3\pi}{10}$ (d) $\frac{\pi}{10}$

Q.46. Simplify the following.
$\sqrt{2 + \sqrt{2 + 2cos4\theta}}$
NTPC CBT - I 08/02/2021 (Evening)
(a) cos2θ (b) cosθ (c) 2cosθ (d) sinθ

Q.47. Solve the following
sin($cos^{-1}\frac{3}{5}$) + cos($tan^{-1}\frac{5}{12}$)
NTPC CBT - I 11/02/2021 (Evening)
(a) $\frac{100}{65}$ (b) $\frac{108}{65}$ (c) $\frac{112}{65}$ (d) $\frac{104}{65}$

Q.48. If $\cos(\alpha + \beta) = 0$, Then $\sin(\alpha - \beta)$ can be reduced to :
NTPC CBT - I 12/02/2021 (Morning)
(a) $\cos\beta$ (b) $\sin2\alpha$ (c) $\sin\alpha$ (d) $\cos2\beta$

Q.49. In triangle ABC, if $\sin A\cos B = \frac{1}{4}$ and $3\tan A = \tan B$ then $cot^2 A$ is equal to :
NTPC CBT - I 15/02/2021 (Evening)
(a) 3 (b) 4 (c) 2 (d) 5

Q.50. In a triangle ABC , tanA + tanB + tanC = ?
NTPC CBT - I 17/02/2021 (Morning)
(a) tanAtanB + tanBtanC + tanCtanA
(b) 1
(c) tanAtanBtanC
(d) – tanAtanBtanC

Q.51. What is the domain of sine function?
NTPC CBT - I 05/03/2021 (Evening)
(a) W (b) R (c) N (d) Z

Q.52. All trigonometric functions are periodic. What is the period of cosx ?
NTPC CBT - I 07/03/2021 (Morning)
(a) π (b) $\frac{\pi}{2}$ (c) 2π (d) $\frac{\pi}{3}$

Q.53. If $\operatorname{cosec}\theta - \cot\theta = a$, then the value of $\operatorname{cosec}\theta$ is :
NTPC CBT - I 11/03/2021 (Morning)
(a) $\frac{1}{2}(a + \frac{1}{a})$ (b) $\frac{1}{2}(a - \frac{1}{a})$
(c) $\frac{1}{4}(a - \frac{1}{a})$ (d) $(a + \frac{1}{a})$

Q.54. If $\cos28° + sin28° = k$, then $\cos17°$ *is equal to* :
NTPC CBT - I 12/03/2021 (Evening)
(a) $-\frac{k}{\sqrt{2}}$ (b) $\frac{k}{\sqrt{2}}$ (c) $\sqrt{2}\,k$ (d) $\frac{k}{2}$

Q.55. If $(1 + \tan\alpha)(1 + \tan4\alpha) = 2$, $\alpha \in (0, \frac{\pi}{16})$ then α is equal to :
NTPC CBT - I 12/03/2021 (Evening)
(a) $\frac{\pi}{40}$ (b) $\frac{\pi}{60}$ (c) $\frac{\pi}{20}$ (d) $\frac{\pi}{30}$

Q.56. The domain of cosecx is:
NTPC CBT - I 15/03/2021 (Morning)
(a) R - {nπl nϵZ} (b) R - {2nπl nϵZ}
(c) {nπl nϵZ} (d) {2nπl nϵZ}

Q.57. If triangle ABC is a right angled isosceles triangle, right angled at B, then find the value of.
$$\frac{sin(A-C) + sin(A+C) - 2sinB}{cotA + cotB + cotC}$$
NTPC CBT - I 08/04/2021 (Evening)
(a) $\frac{1}{2}$ (b) $-\frac{1}{2}$ (c) $\frac{3}{2}$ (d) 0

Q.58. If $\cos^2 x + \sin x = \frac{5}{4}$, then find the value of 'sin x'.
RRB JE 24/05/2019 (Morning)
(a) $\frac{3}{4}$ (b) $\frac{1}{2}$ (c) $-\frac{1}{2}$ (d) $\frac{3}{2}$

Q.59. Simplify : $\frac{sin\,3A}{sinA} + \frac{cos3A}{cosA}$
RRB JE 25/05/2019 (Evening)
(a) 4 cos 2A (b) - 2
(c) 2 cos A (d) 2 sin A

Q. 60. What will be the value of 5°37'30" in radian?
ALP Tier II 21/01/2019 (Afternoon)
(a) $\frac{\pi}{32}$ (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{2}$

Q.61. If ABCD is a Cyclic Quadrilateral, then the value of
$cos^2A - cos^2B - cos^2C + cos^2D$ is:
RRB ALP Tier - I 17/08/2018 (Morning)
(a) 1 (b) 0 (c) 2 (d) -1

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.62. Express $\sin\theta$ in terms of $\cot\theta$, where θ is an acute angle.
Group D 17/08/2022 (Morning)
(a) $1 + cot^2\theta$ (b) $\sqrt{1 + cot^2\theta}$
(c) $\frac{1}{1 + cot^2\theta}$ (d) $\frac{1}{\sqrt{1 + cot^2\theta}}$

Q.63. Find the ratio of (Sin^2 22° + Sin^2 68°) and ($Cos^2$33° + Cos^2 57°) .
Group D 17/08/2022 (Afternoon)
(a) 1 : 4 (b) 1 : 1 (c) 1 : 2 (d) 2 : 1

Q.64. If θ is an acute angle, find the denominator A, when
$(\operatorname{cosec}\theta - \cot\theta)^2 = \frac{1 - cos\,\theta}{A}$
Group D 17/08/2022 (Evening)
(a) 1 + sinθ (b) cosecθ - 1
(c) 1 + cosθ (d) cotθ

Q.65. The value of $\sqrt{\frac{1 - cos\,\theta}{1 + cos\,\theta}}$ is:
Group D 18/08/2022 (Morning)
(a) cosec θ + cot θ (b) sec θ + cot θ
(c) sec θ - cot θ (d) cosec θ - cot θ

Q.66. Find the value of
$2\sec^2A + 4\cos ec^2 A - 2\tan^2 A - 4\cot^2A$.
Group D 22/08/2022 (Morning)
(a) 6 (b) 4 (c) 2 (d) 8

Q.67. Simplify $\frac{sin\,A}{1 + cos\,A} + \frac{1 + cos\,A}{sin\,A}$.
Group D 23/08/2022 (Morning)
(a) 2sec A (b) sec A
(c) cosec A (d) 2cosec A

Q.68. Find the product of the given equation
sin 90°. sin 89°.sin 88°.sin 87°…… sin 0°.
Group D 23/08/2022 (evening)
(a) $\frac{\pi}{2}$ (b) 0 (c) π (d) 1

Q.69. If A is an acute angle of triangle ABC, the $\frac{cosA - sinA + 1}{cosA + sinA - 1}$ is equal to:
Group D 25/08/2022 (Morning)
(a) cos A + cosec A (b) cot A + cosec A
(c) tan A + cos A (d) cot A + sec A

Q.70. If A is an acute angle, and tan^2 A + secA = 11, then find the value of cotA.
Group D 26/08/2022 (Afternoon)
(a) $\frac{1}{2\sqrt{3}}$ (b) $\frac{1}{2\sqrt{5}}$ (c) $\frac{1}{2\sqrt{2}}$ (d) $\frac{1}{2\sqrt{7}}$

Q.71. Which of the following is RHS of the equation $\frac{sin^2A}{1 - cosA}$ = ?
Group D 01/09/2022 (Morning)
(a) sec A + tan A (b) cosec A
(c) tan A (d) cos A + 1

Q.72. If sec $\theta = \frac{5}{3}$, and θ is an acute angle, then the value of $\frac{3\,tan\,\theta - 5\,cos\,\theta}{5\,sin\,\theta - 3\,sec\,\theta}$ = ?
Group D 01/09/2022 (Afternoon)
(a) 4 (b) 0 (c) 1 (d) -1

Q.73. If $(\sin\beta + \operatorname{cosec}\beta)^2 + (\sec\beta - \cos\beta)^2 = a + \tan^2\beta + \cot^2\beta$, then the value of a is:
Group D 01/09/2022 (Evening)
(a) 3 (b) 0 (c) 2 (d) 5

Q.74. The value of $\frac{20 + 20\,tan^2\,A}{50 + 50\,cot^2A}$ is:
Group D 02/09/2022 (Afternoon)
(a) $\frac{5}{2}\,tan^2$A (b) $\frac{2}{5}\,tan^2$A
(c) $\frac{5}{2}\,cot^2$ A (d) $\frac{2}{5}\,cot^2$ A

Q.75. Let $0 < \theta < 90°$
$$\sqrt{\frac{sec^2\theta + cosec^2\theta}{tan^2\theta - sin^2\theta}} \times \frac{(1 + tan^2\theta)\,sin^2\theta}{(cosec\theta - cot\theta)(1 + cos\theta)}$$
is equal to:
Group D 02/09/2022 (Evening)
(a) $sin^2\,\theta\,cos^2\,\theta$ (b) $sec^2\,\theta$
(c) $cosec^2\theta\,sec^2\theta$ (d) $cot^2\theta$

Q.76.
$$\frac{(1 + cot\theta - cosec\theta)(1 + tan\theta + sec\theta)}{(sec\theta - cos\theta)} \times \frac{(sec^2\theta)}{(cot\theta + tan\theta)}$$, $0° < \theta < 90°$, is equal to:
Group D 05/09/2022 (Morning)
(a) 2 secθ (b 2 cosec θ (c) sin θ (d) cosθ

Q.77.
$\frac{(cosec\theta - sin\theta)\,(sec\theta - cos\theta)\,(tan\theta + cot\theta)}{cos\theta\,(sec\theta - tan\theta)^2\,(sec\theta + tan\theta)}$
$= \frac{1}{1-k}$, 0°<θ< 90°, then k = ?
Group D 05/09/2022 (Evening)
(a) $cos\theta$ (b) $sin\theta$ (c) $cot\theta$ (d) $sec\theta$

Q.78. Find the value of $(sinA + cosecA)^2 + (cosA + secA)^2$
Group D 06/09/2022 (Morning)
(a) 5 + $cosec^2$ A - sec² A
(b) 5 + $cosec^2$ A + sec² A
(c) 5 + sec A+ cosec A
(d) 5 - $cosec^2$ A + sec² A

Q.79. Find the value of (1 + tan 20° + sec 20°) (1+ cot 20° - cosec 20°).
Group D 06/09/2022 (Afternoon)
(a) 1 (b) -1 (c) 0 (d) 2

Q.80. The value of
$[\frac{cos\,40°}{1+sin\,40°}] + [\frac{1+sin\,40°}{cos\,40°}]$ is:
Group D 08/09/2022 (Morning)
(a) 2 sec 40° (b) 2 cot 40°
(c) 2 cosec 40° (d) 2 tan 40°

Q.81. The value of
(cosec x + cot x + 1)(sec x - tan x - 1) is:
Group D 09/09/2022 (Afternoon)
(a) − 2 (b) − 1 (c) 0 (d) 1

Q.82. Find the value of
$\frac{tan^2\,60° + cot^2 30°}{tan^2 20° - sec^2\,20°} - \frac{sin\,90° + cos\,0°}{cosec^2 20° - cot^2\,20°}$.
Group D 13/09/2022 (Morning)
(a) − 2 (b) − 8 (c) 4 (d) − 4

Q.83. The value of sin²θ + cos²θ − (sec²θ − tan²θ) + tanθ cosθ − sinθ is_____.
Group D 13/09/2022 (Evening)
(a) 0 (b) 4sinθcoseθ (c) - 1 (d) sec²θ

Q.84. sec² θ + (cosec² θ - 1) - (1 + $tan^2\theta$) - cot² θ =_____.
Group D 16/09/2022 (Morning)
(a) 1 (b) 0 (c) $sec^2\theta$ (d) $cot^2\theta$

Q.85. The value of
sin$x$ + $\frac{cosx}{tan\,(90 - x)}$ is _____.
Group D 16/09/2022 (Afternoon)
(a) 2cosecx (b) 2sinx (c) cotx (d) tanx

Q.86. The value of $\frac{sin(90° - \theta)\,cos(90° - \theta)\,cot\,(90° - \theta)}{cos^2\theta - 1}$ is _____.
Group D 19/09/2022 (Morning)
(a) tanθ (b) 0 (c) -1 (d) 2sinθcosθ

Q.87. If cot A+ cos A = m and
cot A − cos A = n, then:
Group D 19/09/2022 (Evening)
(a) m² + n² = 4 mn (b) (m² - n²)² = 16 mn
(c) (m² - n²)² = 4 mn (d) m² - n² = 16 mn

Q.88. *If* $x = a\,sec^n\theta$, $y = b\,tan^n\theta$, *then* :
Group D 20/09/2022 (Morning)
(a) $\left(\frac{x}{a}\right)^{\frac{2}{n}} - \left(\frac{y}{b}\right)^{\frac{2}{n}} = 1$
(b) $\left(\frac{x}{a}\right)^{\frac{2}{n}} + \left(\frac{y}{b}\right)^{\frac{2}{n}} = 1$
(c) $\left(\frac{a}{x}\right)^{\frac{2}{n}} - \left(\frac{b}{n}\right)^{\frac{2}{n}} = 1$
(d) $\left(\frac{a}{n}\right)^{\frac{2}{n}} + \left(\frac{b}{n}\right)^{\frac{2}{n}} = 1$

Q.89. The Value of
$(sin\,x + sec\,x)^2 + (cosec\,x + cos\,x)^2$ is:
Group D 20/09/2022 (Afternoon)
(a) $(1 - sec\,x\ cosec\,x)^2$
(b) $(2 + sec\,x\ cosec\,x)^2$
(c) $(sec\,x\,cosec\,x + 1)^2$
(d) $(2 - secx\ cosec\,x)^2$

Q.90. The value of $tan^6A + 3\,tan^2A\ sec^2A + 1$ *is* :
Group D 22/09/2022 (Afternoon)
(a) sec^6A (b) $sec^4A + tan^2A$
(c) sec^5A (d) sec^4A

Q.91. The value of $\left(\frac{1}{sec^2\theta - cos^2\theta} + \frac{1}{cosec^2\theta - sin^2\theta}\right)(sin^2\theta\ cos^2\theta)$
Group D 22/09/2022 (Evening)
(a) $\frac{1+cos^2\theta\ sin^2\theta}{2-cos^2\theta\,sin^2\theta}$ (b) $\frac{1+cos^2\theta\ sin^2\theta}{2+cos^2\theta\ sin^2\theta}$
(c) $\frac{1-cos^2\theta\ sin^2\theta}{2+cos^2\theta\ sin^2\theta}$ (d) $\frac{1-cos^2\theta\ sin^2\theta}{2-cos^2\theta\ sin^2\theta}$

Q.92. The value of (1 + $cot^2\theta$)(1 + cosθ) (1 − cosθ) + (1 − sinθ)(1 + sinθ)
(1 + $tan^2\theta$) is:
Group D 26/09/2022 (Afternoon)
(a) 1 (b) 0 (c) 4 (d) 2

Q.93. $sin^6\theta + cos^6\theta$ can be simplified as
Group D 26/09/2022 (Evening)
(a) $1 - sin^2\theta\,cos^2\theta$
(b) $1 + sin^2\theta\,cos^2\theta$
(c) $1 + 3sin^2\theta\,cos^2\theta$
(d) $1 - 3sin^2\theta\,cos^2\theta$

Q.94. If α is an acute angle and tan²α − secα = 19, then the value of cosα is:
Group D 28/09/2022 (Morning)
(a) $\frac{2}{3}$ (b) $\frac{1}{5}$ (c) $\frac{1}{4}$ (d) $\frac{1}{2}$

Q.95. The value of $\sqrt{\frac{4-5\,cos^2\theta}{sin^2\theta} + cot^2\theta}$ is
Group D 28/09/2022 (Evening)
(a) 1 (b) 4 (c) 2 (d) 3

Q.96. If 3 $sin^2\theta$ + 7 $cos^2\theta$ = 6 and 0 < θ ≤ 90°, then the value of θ is:
Group D 29/09/2022 (Afternoon)
(a) 90° (b) 60° (c) 30° (d) 45°

Q.97. In a right-angled triangle ABC, right-angled at B, if tan A = $\frac{1}{\sqrt{3}}$, the value of (sin A cos C + cos A sin C) is:
Group D 06/10/2022 Morning)
(a) 1 (b)$\frac{3}{4}$ (c) $\frac{1}{2}$ (d) $\frac{1}{4}$

Q.98. $\frac{3 - 4sin^2\theta}{cos^2\theta}$ can be simplified as
Group D 06/10/2022 (Afternoon)
(a) 3 + $tan^2\theta$ (b) $3cos^2\theta - 4sec^2\theta$
(c) $3cot^2\theta - tan^2\theta$ (d) $3 - tan^2\theta$

Q.99. $cot\theta\left(\frac{1}{cosec\,\theta - 1} + \frac{1}{cosec\,\theta + 1}\right) \times (sin\,\theta - cosec\,\theta)(cos\,\theta - sec\,\theta)$
, $0° < \theta < 90°$, is equal to :
Group D 11/10/2022 (Afternoon)
(a) 2 sin θ `(b) cosec θ
(c) 2 cos θ (d) sec θ

RRB NTPC CBT - 2
(09/05/2022 to 17/06/2022)

Q.100. If $\frac{1}{1+tan\theta} + \frac{1}{1-tan\theta}$ = 4, 0° < θ <90°, then what is the value of
($cosec^2\theta + sec^2\theta$) ?
Level 6 (09/05/2022) Shift 1
(a) $\frac{9}{2}$ (b) $\frac{4}{3}$ (c) $\frac{8}{3}$ (d) $\frac{5}{2}$

Q.101. If 2 siny + cosy = $\sqrt{5}$ siny, then find the value of tan y.
Level 6 (09/05/2022) Shift 1
(a) $\sqrt{5}$ − 1 (b) $\sqrt{5}$ − 2 (c) $\sqrt{5}$ + 2 (d) $\sqrt{5}$ + 1

Q.102.
Evaluate $\frac{cos^2\,(45° + \theta) + cos^2(45° - \theta)}{cosec^2 30° sin^2 45° - sec^2 60°}$
Level 5 (12/06/2022) Shift 1
(a) $-\frac{1}{2}$ (b) $-\frac{1}{6}$ (c) $\frac{1}{6}$ (d) $\frac{1}{2}$

Q.103. If cot²θ = 1 + cos²θ − sin²θ, 0° < θ < 90°, then find the value of
tan²θ + cosec²θ.
Level 5 (12/06/2022) Shift 2
(a) $\frac{1}{2}$ (b) $\frac{3}{2}$ (c) −1 (d) 3

Q.104. If $\sin\theta + \left(\frac{1}{4}\right)\text{cosec}\theta = 1$, and $0 \leq \theta \leq 90°$, then find the value of θ
Level 2 (13/06/2022) Shift 1
(a) 45° (b) 30° (c) 60° (d) 0°

Q.105. If $3\cos^2\theta + 1 = 4\sin\theta$, $0° < \theta < 90°$, then the value of $\sec^2\theta$ is :
Level 3 (14/06/2022) Shift 2
(a) $\frac{9}{5}$ (b) $\frac{4}{5}$ (c) $\frac{5}{4}$ (d) $\frac{5}{9}$

Q.106. If $sin^2\beta - \sin 30° = 0$ and β is an acute angle, find the value of β.
Level 5 (15/06/2022) Shift 3
(a) 60° (b) 0° (c) 90° (d) 45°

Q.107. If $\tan\theta + 3\cot\theta = 2\sqrt{3}$, $0° < \theta < 90°$, then what is the value of $cosec^2\theta$?
Level 3 (17/06/2022) Shift 1
(a) $\frac{7}{6}$ (b) $\frac{2}{3}$ (c) $\frac{4}{3}$ (d) $\frac{1}{4}$

RRB NTPC CBT - 1
(28/12/2020 to 31/07/2021)

Q.108. If $\sin = \frac{3}{4}$ and $\cos\theta = \frac{5}{4}$, then the value of $\frac{1 + tan\theta}{1 - cot\theta}$ is :
RRB NTPC 28/12/2020 (Morning)
(a) $\frac{11}{5}$ (b) $-\frac{8}{5}$ (c) $\frac{2}{5}$ (d) $-\frac{12}{5}$

Q.109. If $\frac{1}{sin^2 65^o + cos^2 65^o} + \frac{sin15°}{cos75°} + \frac{cos65^o}{sin25^o} = \sqrt{3}\tan\theta$, then the value of θ is :
RRB NTPC 28/12/2020 (Morning)
(a) 60° (b) 45° (c) 30° (d) 90°

Q.110. If $\cos2\theta = \sin\theta$ and θ lies between 0 and 90°, then θ will be :
RRB NTPC 28/12/2020 (Evening)
(a) 45° (b) 90° (c) 30° (d) 60°

Q.111. Find the value of
$\frac{sin\ 27°cos63°}{cos^2 27°} - \frac{sec27°cosec63°}{tan^2 45°}$ = ?
RRB NTPC 29/12/2020 (Evening)
(a) 0 (b) 2 (c) 1 (d) - 1

Q.112. The value of cos12° + cos84° + cos 168° + cos96° is :
RRB NTPC 30/12/2020 (Morning)
(a) - 1 (b) 0 (c) 0.5 (d) 1

Q.113. If $\tan\theta + \cot\theta = 5$, then the value of $\tan^2\theta + \cot^2\theta + 2\tan^2 60°$ is :
RRB NTPC 04/01/2021 (Morning)
(a) 29 (b) $10\sqrt{3}$ (c) 25 (d) $29\sqrt{3}$

Q.114. Find the value of tan15° + cot15°
RRB NTPC 04/01/2021 (Evening)
(a) 4 (b) 6 (c) 8 (d) 2

Q.115. The value of sin(45° + A) - cos(45° - A) is :
RRB NTPC 05/01/2021 (Morning)
(a) 2cosA (b) 2sinA (c) 0 (d) 1

Q.116. If sin2A = 2sinA, then A = ?
RRB NTPC 05/01/2021 (Evening)
(a) 30° (b) 90° (c) 0° (b) 60°

Q.117. $(sinA + cosA)^2$ - 2sinAcosA is equal to :
RRB NTPC 05/01/2021 (Evening)
(a) 0 (b) $sin^2A - cos^2A$ (c) 1 (d) 2

Q.118. Find the value of
$cos^2(270 - \Phi) - sin^2(180 - \Phi) + sin^2(\frac{\pi}{2})sin^2(270 - \Phi)$.
RRB NTPC 08/01/2021 (Morning)
(a) $cos^2\Phi$ (b) $sin^2(\frac{\pi}{2})$
(c) $sin^2(\Phi)$ - 1 (d) $sin^2(\Phi)$

Q.119. If $6(\sec^2 59° - \cot^2 31°) + \frac{2}{3}\sin 90° - 3\tan^2 56°\text{y}\tan^2 34° = \frac{y}{3}$, then the value of y is :
RRB NTPC 08/01/2021 (Evening)
(a) 1 (b) 2 (c) 3 (d) 4

Q.120. If $\sqrt{3}sin\theta - cos\theta = 0$ (θ *is an acute angle*) , *then the value of* $cos^3\theta - \sqrt{3}sin^3\theta$.
RRB NTPC 09/01/2021 (Morning)
(a) $\frac{\sqrt{3}}{4}$ (b) $\frac{\sqrt{3}}{2}$ (c) - 1 (d) $\frac{3}{8}$

Q.121. If $\sin\theta - \cos\theta = 0$ (angle in first quadrant) then the value of $sin^3\theta + 3\ cos^3\theta$ is :
RRB NTPC 09/01/2021 (Evening)
(a) $\frac{1}{\sqrt{2}}$ (b) 2 (c) $\sqrt{2}$ (d) $2\sqrt{2}$

Q.122. If $16sec^2\theta - 40sec\theta + 25 = 0$ and θ is an acute angle, then what will be the value of tanθ ?
RRB NTPC 12/01/2021 (Morning)
(a) $\frac{3}{4}$ (b) $\frac{4}{5}$ (c) $\frac{3}{5}$ (d) $\frac{4}{3}$

Q.123. If $\cos(x + y) = \frac{1}{2}$ and $\sin(x - y) = 0$, where x and y are positive acute angles and $x \geq y$. then x and y are:
RRB NTPC 12/01/2021 (Evening)
(a) 80° and 80° (b) 60° and 60°
(c) 45° and 45° (d) 30° and 30°

Q.124. If x = asinθ , and y = btanθ , then find the value of $\frac{a^2}{x^2} - \frac{b^2}{y^2}$.
RRB NTPC 13/01/2021 (Evening)
(a) 1 (b) 2 (c) - 1 (d) 0

Q.125. The value of $\sqrt{\frac{1 + cos2A}{1 - cos2A}}$ = ?
(Note: A is non - zero)
RRB NTPC 16/01/2021 (Evening)
(a) tanA (b) sinA (c) cosA (d) cotA

Q.126. If $r\sin\theta = \frac{7}{2}$ and $r\cos\theta = \frac{7\sqrt{3}}{2}$, then what will be the value of r ?
RRB NTPC 17/01/2021 (Morning)
(a) - 1 (b) $\sqrt{3}$ (c) 5 (d) 7

Q.127. If $cos^4\theta - sin^4\theta = \frac{2}{3}$ *then the* value of $1 - 2\sin^2\theta$ *is* :
RRB NTPC 17/01/2021 (Evening)
(a) $\frac{5}{3}$ (b) - 1 (c) 0 (d) $\frac{2}{3}$

Q.128. If $\sin(3A - 20^o) = \cos(20^o - 3B)$, then the value of A - B is:
RRB NTPC 17/01/2021 (Evening)
(a) 30° (b) 45° (c) 60° (d) 20°

Q.129. Find the value of the expression [cosec(75° + θ) - sec(15° - θ) - tan(55° + θ) + cot(35° - θ)] .
RRB NTPC 18/01/2021 (Morning)
(a) 1 (b) 0 (c) - 1 (d) $\frac{3}{2}$

Q.130. Find the value of sin15° .
RRB NTPC 18/01/2021 (Morning)
(a) $\frac{\sqrt{3} + 1}{2\sqrt{2}}$ (b) $\frac{\sqrt{3} - 1}{2\sqrt{2}}$
(c) $\frac{\sqrt{3} + 1}{\sqrt{2}}$ (d) $\frac{\sqrt{3} - 1}{\sqrt{2}}$

Q.131. If $\sin\theta + \text{cosec}\theta = 2$, then the value of $sin^8\theta + cosec^8\theta$ is :
RRB NTPC 18/01/2021 (Morning)
(a) 2 (b) 2^8 (c) 1 (d) 2^4

Q.132. In right angle ΔABC, right angled at B , if $\tan A = \sqrt{3}$ then sinAcosC + cosA sinC = ?
RRB NTPC 18/01/2021 (Morning)
(a) 1 (b) 2 (c) 3 (d) 4

Q.133. The value of cos75° + sin15° is equal to :
RRB NTPC 18/01/2021 (Evening)
(a) $\frac{\sqrt{3} - 1}{\sqrt{2}}$ (b) $\frac{\sqrt{3}}{\sqrt{2}}$ (c) $\frac{\sqrt{2}}{\sqrt{3}}$ (d) $\frac{\sqrt{3} + 1}{\sqrt{2}}$

Q.134. In a triangle, right angled at B , AB = 12 cm and BC = 5 cm . What will be the value of ?

(i) sinAcosA (ii) sinCcosC
RRB NTPC 18/01/2021 (Evening)
(a) $\frac{26}{169}, \frac{25}{169}$ (b) $\frac{25}{169}, \frac{60}{169}$
(c) $\frac{60}{169}, \frac{60}{169}$ (d) $\frac{60}{169}, \frac{25}{169}$

Q.135. If cotx = 3 , then what will be the value of $\frac{(3+3sinx)(1-sinx)}{(2+2cosx)(3-3cosx)}$?
RRB NTPC 18/01/2021 (Evening)
(a) 9 (b) $\frac{9}{2}$ (c) $\frac{9}{3}$ (d) $\frac{9}{4}$

Q.136. If sinA = $\frac{1}{2}$ and cosB = $\frac{1}{2}$ then find A + B .
RRB NTPC 19/01/2021 (Morning)
(a) 60° (b) 90° (c) 30° (d) 75°

Q.137. The value of 1 - sin35°cos55° is equal to :
RRB NTPC 19/01/2021 (Evening)
(a) Cosec²55° (b) Sin²35°
(c) Cos²35° (d) Sec²55°

Q.138. If tan2θ = cot(θ + 6°) then θ is..
RRB NTPC 19/01/2021 (Evening)
(a) 12° (b) 45° (c) 28° (d) 24°

Q.139. If A + B = 90^o $and\ sinA = \frac{3}{5}$, then the value of tanB is :
RRB NTPC 20/01/2021 (Morning)
(a) $\frac{5}{4}$ (b) $\frac{3}{5}$ (c) $\frac{5}{3}$ (d) $\frac{4}{3}$

Q.140. If sin3θ = cos(θ $-\ 6^0$) then θ is :
RRB NTPC 20/01/2021 (Evening)
(a) 24° (b) 26° (c) 12° (d) 3°

Q.141. The value of tan5°tan25°tan45°tan65°tan85° is equal to :
RRB NTPC 20/01/2021 (Evening)
(a) 1 (b) 4 (c) 2 (d) 3

Q.142. What is the value of sin(48° + θ) - cos(42° - θ) ?
RRB NTPC 21/01/2021 (Morning)
(a) - 1 (b) 1 (c) 2 (d) 0

Q.143. What is the value of the following expressions ?
(tan2°tan88°)(tan3°tan87°)....(tan43°tan47°) tan45°
RRB NTPC 21/01/2021 (Morning)
(a) 0 (b) ∞ (c) 1 (d) - 1

Q.144. If $\frac{sin\theta+cos\theta}{sin\theta-cos\theta} = \frac{\sqrt{3}-1}{\sqrt{3}+1}$, then the angle θ is :
RRB NTPC 21/01/2021 (Evening)
(a) 240° (b) 45° (c) 300° (d) 90°

Q.145. The expression
$\frac{tan\ A}{1-cot\ A} + \frac{cot\ A}{1-tan\ A}$
can be written as :
RRB NTPC 21/01/2021 (Evening)
(a) secA + cosecA (b) tanA + cotA
(c) 1 + secAcosecA (d) 1 + sinAcosA

Q.146. If the ratio of the sine of an acute angle to its cosine is 5 : 12, then what will the value of sine of that angle be ?
RRB NTPC 22/01/2021 (Morning)
(a) $\frac{5}{13}$ (b) $\frac{12}{13}$ (c) $\frac{12}{5}$ (d) $\frac{5}{12}$

Q.147. If x = acosecθ + bcotθ , y = bcosecθ + acotθ, then what will be the value of $x^2 - y^2$?
RRB NTPC 22/01/2021 (Evening)
(a) $a^2 - b^2$ (b) $a^2 + b^2$ (c) $a + b$ (d) 0

Q.148. What is the value of $\frac{1-tan^2A}{1+tan^2A}$?
RRB NTPC 22/01/2021 (Evening)
(a) cos2A (b) cos^2A (c) sin2A (d) 1

Q.149. If $\frac{cosA}{1-sinA} + \frac{cosA}{1+sinA}$ = 4 , then what will be the value of A ?
RRB NTPC 22/01/2021 (Evening)
(a) 90° (b) 60° (c) 30° (d) 45°

Q.150. The value of
($\frac{sin\ 29°}{cos61°}$ - $4(cos^2 31° + cos^2 59°)$ + $\frac{1}{\sqrt{3}}$
$(tan27°\ sin60°\ tan63°$) is:
RRB NTPC 22/01/2021 (Evening)
(a) – $\frac{5}{2}$ (b) 10 (c) $\frac{1}{2}$ (d) - 5

Q.151. If $tan3\theta tan\ 6\theta = 1$, then the value of tan30θ is :
RRB NTPC 23/01/2021 (Morning)
(a) $3\sqrt{3}$ (b) – $\sqrt{3}$ (c) – $\frac{1}{\sqrt{3}}$ (d) 0

Q.152. If $2sin(3x-3)^o = tan240^o$, then the value of x in degree is :
RRB NTPC 23/01/2021 (Morning)
(a) 21° (b) 25° (c) 27° (d) 23°

Q.153. If cos(x - y) = $\frac{\sqrt{3}}{2}$, and sin(x + y) = 1 , where x and y are positive acute angle and x ≥ y , then x and y are _____.
RRB NTPC 25/01/2021 (Evening)
(a) 50°, 40° (b) 80°, 10°
(c) 70°, 20° (d) 60°, 30°

Q.154. If 1 + tanθ = $\sqrt{3}$, then find the value of $\sqrt{3}$ cotθ - 1 ?
RRB NTPC 25/01/2021 (Evening)
(a) $\frac{\sqrt{3}+1}{2}$ (b) $\frac{2\sqrt{3}-1}{2}$
(c) $\frac{\sqrt{3}-1}{2}$ (d) $\frac{2\sqrt{3}+1}{2}$

Q.155. If x + y = 75 and sinx : siny = $\frac{1}{\sqrt{2}}$: $\frac{1}{2}$, then x : y is :
RRB NTPC 28/01/2021 (Evening)
(a) 3 : 1 (b) 2 : 3 (c) 1 : 3 (d) 3 : 2

Q.156. $cos^2 31° + cos^2 59°$ is equal to :
RRB NTPC 28/01/2021 (Evening)
(a) $2sin^2 31°$ (b) 0 (c) 1 (d) $2cos^2 31°$

Q.157. If sinθ + $cosec\theta = \sqrt{5}$, then the $value\ of\ sin^3\theta + cosec^3\theta$ is :
RRB NTPC 28/01/2021 (Evening)
(a) $3\sqrt{5}$ (b) $\frac{1}{\sqrt{5}}$ (c) 0 (d) $2\sqrt{5}$

Q.158. If cot35° = 2 - $\sqrt{3}$ then the value of tan35°cot55° + tan55°cot35° is :
RRB NTPC 29/01/2021 (Evening)
(a) 13 (b) 12 (c) 15 (d) 14

Q.159. Find the value of tan1°tan2°tan3°..... tan89° .
RRB NTPC 30/01/2021 (Morning)
(a) $\sqrt{3}$ (b) 1 (c) 0 (d) $\frac{1}{\sqrt{3}}$

Q.160. If sinx - 3cosx = $\sqrt{3}$cosx , then the value of cotx is :
RRB NTPC 31/01/2021 (Morning)
(a) $\sqrt{3}$ (b) 3 + $\sqrt{3}$ (c) 3 - $\sqrt{3}$ (d) $\frac{3-\sqrt{3}}{6}$

Q.161. What is the value of the following expression ?
$\frac{cos3x+cosx}{sin3x-sinx}$
RRB NTPC 31/01/2021 (Evening)
(a) tanx (b) sinx (c) cosx (d) cotx

Q.162. If sin(A - B) = $\frac{1}{2}$ and cos(A + B) = $\frac{1}{2}$ with 0° < (A + B) ≤ 90°, A > B , then find the measure of A and B.
RRB NTPC 01/02/2021 (Morning)
(a) 45°, 15° (b) 40°, 35°
(c) 25°, 20° (d) 35°, 15°

Q.163. If (1 + tanA)(1 + tanB) = 2, then what will be the value of tan(A + B) ?
RRB NTPC 02/02/2021 (Morning)
(a) -2 (b) 2 (c) 0 (d) 1

Q.164. The value of $\frac{tan45^0 - tan30^0}{1+tan45^0 tan30^0}$ is:
RRB NTPC 02/02/2021 (Morning)
(a) 2 + $\sqrt{3}$ (b) 2 - $\sqrt{3}$ (c) $\sqrt{3-2}$ (d) 1

Q.165. If $\cos\theta + \sec\theta = \sqrt{3}$, then the value of $\cos^3\theta + \sec^3\theta$ is :
RRB NTPC 02/02/2021 (Evening)
(a) $2\sqrt{3}$ (b) $\frac{1}{\sqrt{3}}$ (c) $3\sqrt{3}$ (d) 0

Q.166. If $\cot3\theta\cot6\theta = 1$, then the value of $\tan15\theta$ will be :
RRB NTPC 03/02/2021 (Morning)
(a) $-\sqrt{3}$ (b) 0 (c) $-\frac{1}{\sqrt{3}}$ (d) $3\sqrt{3}$

Q.167. if $\cos x + \frac{1}{\cos x} = 2$, then find the value of $\cos^n x + \frac{1}{\cos^n x}$.
RRB NTPC 03/02/2021 (Morning)
(a) 8 (b) 6 (c) 4 (d) 2

Q.168. The minimum value of $11\sin^2\theta + 12\cos^2\theta$ is :
RRB NTPC 04/02/2021 (Morning)
(a) 12 (b) 0 (c) 11 (d) 1

Q.169. In triangle ABC, what will be the value of a(bcosC - ccosB) ?
RRB NTPC 05/02/2021 (Morning)
(a) b^2 (b) c^2 (c) $b^2 + c^2$ (d) $b^2 - c^2$

Q.170. Find the value of cos37°sec143° + sin34°cosec146° ?
RRB NTPC 08/02/2021 (Morning)
(a) 1 (b) -1 (c) $\frac{1}{2}$ (d) 0

Q.171. Evaluate the following.
$\cos^{-1}(\frac{1}{\sqrt{2}}) + \sec^{-1}(-\sqrt{2})$
RRB NTPC 08/02/2021 (Evening)
(a) π (b) $-\frac{\pi}{3}$ (c) 0 (d) $\frac{\pi}{3}$

Q.172. The value of $\text{Cos}(\sec^{-1}x + \text{cosec}^{-1}x)$, $|x| \geq 1$
RRB NTPC 09/02/2021 (Morning)
(a) 0 (b) 2 (c) ± 1 (d) 1

Q.173. If $\sqrt{2}\sin(5x - 5)° = \tan45°$, then the value of x (in degrees) is :
RRB NTPC 09/02/2021 (Evening)
(a) 14 (b) 16 (c) 10 (d) 12

Q.174. If cot(A + B)cot(A - B) = 1, then the value of $\cot(\frac{2A}{3})$ is :
RRB NTPC 09/02/2021 (Evening)
(a) $\frac{\sqrt{3}}{2}$ (b) $\frac{2}{\sqrt{3}}$ (c) $\frac{1}{\sqrt{3}}$ (d) $\sqrt{3}$

Q.175. The value of $\tan(\frac{13\pi}{12})$ is :
RRB NTPC 10/02/2021 (Morning)
(a) $3 - \sqrt{3}$ (b) $2 + \sqrt{3}$ (c) $4 - \sqrt{3}$ (d) $2 - \sqrt{3}$

Q.176. If $\cos x = -\frac{3}{5}$ and x lies in the third quadrant, then the value of the sinx is :
RRB NTPC 10/02/2021 (Evening)
(a) 0 (b) $-\frac{4}{5}$ (c) 1 (d) $\frac{4}{5}$

Q.177. If $\tan\theta = \frac{b}{a}$, then $\frac{a\cos\theta + b\sin\theta}{a\cos\theta - b\sin\theta}$ = _____.
RRB NTPC 11/02/2021 (Evening)
(a) $\frac{a^2 - b^2}{a^2 + b^2}$ (b) $\frac{a - b}{a + b}$
(c) $\frac{a^2 + b^2}{a^2 - b^2}$ (d) $\frac{a + b}{a - b}$

Q.178. Find the value of $\frac{1 + \tan75^o}{1 - \tan75^o}$.
RRB NTPC 12/02/2021 (Morning)
(a) $-\sqrt{3}$ (b) $-\frac{2}{\sqrt{3}}$ (c) $\frac{1}{\sqrt{3}}$ (d) $\sqrt{3}$

Q.179. If $\text{cosec}^4\theta = 49 + \cot^4\theta$, what is the value of sinθ ?
RRB NTPC 15/02/2021 (Morning)
(a) $\frac{1}{6}$ (b) $\frac{1}{7}$ (c) $\frac{1}{5}$ (d) $\frac{1}{8}$

Q.180. If $\tan\theta - \cot\theta = x$ and $\cos\theta - \sin\theta = y$, find the value of $(x^2 + 4)(y^2 - 1)^2$.
RRB NTPC 15/02/2021 (Morning)
(a) 2 (b) 4 (c) 9 (d) 3

Q.181. Find the value of sin78° + cos132° :
RRB NTPC 15/02/2021 (Evening)
(a) sin18° (b) cos18°
(c) cos42° (d) sin42°

Q.182. The value of sin1°sin2°sin3°.....sin180°sin196° is :
RRB NTPC 16/02/2021 (Morning)
(a) $\frac{1}{4}$ (b) $\frac{1}{2}$ (c) 0 (d) $\frac{1}{3}$

Q.183. If $\tan\theta = -\frac{12}{5}$, then the value of sinθ is :
RRB NTPC 16/02/2021 (Evening)
(a) $\sqrt{\frac{12}{13}}$ (b) $\frac{\sqrt{12}}{13}$ (c) $-\frac{12}{13}$ (d) $-\frac{12}{15}$

Q.184. If $\cos\theta = \cos\alpha$ then general solution for θ is :
RRB NTPC 16/02/2021 (Evening)
(a) $\theta = 2n\pi \pm \alpha$, $n \in Z$
(b) $\theta = \frac{3n\pi}{2} \pm \alpha$, $n \in Z$
(c) $\theta = n\pi \pm \alpha$, $n \in Z$
(d) $\theta = \frac{n\pi}{2} \pm \alpha$, $n \in Z$

Q.185. If $\sin\theta - \cos\theta = \frac{\sqrt{3}}{2}$, then find the positive value of sinθ + cosθ.
RRB NTPC 17/02/2021 (Evening)
(a) $\frac{3\sqrt{3}}{4}$ (b) $\frac{\sqrt{7}}{2}$ (c) $\frac{7\sqrt{3}}{2}$ (d) $\frac{\sqrt{5}}{2}$

Q.186. If cosA + secA = $\frac{5}{2}$ and A is an acute angle, then sinA + cosecA is equal to :
RRB NTPC 22/02/2021 (Evening)
(a) $\frac{7}{\sqrt{3}}$ (b) $\frac{5}{2\sqrt{3}}$ (c) $\frac{7}{2\sqrt{3}}$ (d) $2\sqrt{\frac{3}{5}}$

Q.187. If $\frac{\sec\theta + \tan\theta}{\sec\theta - \tan\theta} = \frac{5}{3}$, then the value of sinθ is :
RRB NTPC 23/02/2021 (Morning)
(a) $\frac{1}{3}$ (b) $\frac{3}{4}$ (c) $\frac{2}{3}$ (d) $\frac{1}{4}$

Q.188. Which of the following is a simplified form of the expression : sinAcosA(tanA - cotA), where $(0° \leq A \leq 90°)$?
RRB NTPC 23/02/2021 (Morning)
(a) $2\cos^2A - 1$ (b) $2\sin^2A - 1$
(c) $1 - \cos^2A$ (d) 1

Q.189. If sin2A = cos75°, then the smallest positive value of A is :
RRB NTPC 27/02/2021 (Morning)
(a) 7.5° (b) 30° (c) 15° (d) 75°

Q.190. If A + B = 45°, then (1 + tanA)(1 + tanB) = ?
RRB NTPC 27/02/2021 (Morning)
(a) 4 (b) 1 (c) 2 (d) 3

Q.191. If cos42° = p, then tan48° = ?
RRB NTPC 27/02/2021 (Morning)
(a) $\frac{\sqrt{1 - p^2}}{p}$ (b) $\frac{p}{\sqrt{1 - p^2}}$
(c) $\frac{p + 1}{\sqrt{1 - p^2}}$ (d) $\frac{p^2}{\sqrt{1 - p^2}}$

Q.192. If $\cos x - 3\sin x = \sqrt{3}\sin x$, then the value of tanx is:
RRB NTPC 27/02/2021 (Evening)
(a) $\frac{3 - \sqrt{3}}{6}$ (b) $3 - \sqrt{3}$ (c) $3 + \sqrt{3}$ (d) $\sqrt{3}$

Q.193. The greatest value of sinx + cosx is:
RRB NTPC 27/02/2021 (Evening)
(a) $\frac{1}{4}$ (b) 1 (c) $\sqrt{2}$ (d) $\frac{1}{\sqrt{2}}$

Q.194. The value of sin15°sin30°sin75° is :
RRB NTPC 27/02/2021 (Evening)
(a) $\frac{1}{2\sqrt{2}}$ (b) $\frac{1}{8}$ (c) $\frac{3}{2}$ (d) $\frac{1}{4}$

Q.195. In a triangle ABC that is right angled at C, ∠A = ∠B. The value of sinAsinB + cosAcosB is :
RRB NTPC 01/03/2021 (Morning)
(a) $\frac{1}{\sqrt{2}}$ (b) $\frac{1}{2}$ (c) 1 (d) 0

Q.196. Find the value of cot 19°
$(cot71°\ cos^2 21°\ +\ \frac{1}{tan71°\ sec^2 69°})$.
RRB NTPC 01/03/2021 (Morning)
(a) - 1 (b) $\frac{1}{2}$ (c) 0 (d) 1

Q.197. Find the value of :
tan11° tan41° tan45° tan49° tan79°.
RRB NTPC 01/03/2021 (Evening)
(a) 2 (b) - 1 (c) 0 (d) 1

Q.198. If θ is an acute angle and sinθ = cosθ, then 2cot²θ + sin²θ - 1 = ?
RRB NTPC 02/03/2021 (Morning)
(a) $\frac{3}{2}$ (b) 1 (c) 0 (d) - 1

Q.199. If $\sqrt{\frac{1-cos2\theta}{1+cos2\theta}} = \frac{1}{\sqrt{3}}$, then the value of θ is :
RRB NTPC 02/03/2021 (Evening)
(a) nπ + $\frac{\pi}{3}$ (b) 2nπ + $\frac{\pi}{6}$
(c) nπ + $\frac{\pi}{4}$ (d) nπ + $\frac{\pi}{6}$

Q.200. If tan15° = 2 - $\sqrt{3}$, what is the value of tan15°cot 75° + tan75°cot15°.
RRB NTPC 03/03/2021 (Morning)
(a) 8 (b) 14 (c) 12 (d) 10

Q.201. If 5sinθ + 12cosθ = 13 , then find the value of 5cosθ - 12sinθ ?
RRB NTPC 03/03/2021 (Morning)
(a) - 2 (b) 1 (c) 0 (d) - 1

Q.202. If θ = 60° , then the value of $\frac{2\ cot^2\theta}{1-cot^2\theta}$ = ?
RRB NTPC 04/03/2021 (Evening)
(a) $\sqrt{3}$ (b) $\frac{1}{\sqrt{3}}$ (c) 2 (d) 1

Q.203. If A lies in the second quadrant and 13sinA - 12 = 0, then 5sinA + 12cosA + tan²A - (sec²A - 1) = ?
RRB NTPC 05/03/2021 (Morning)
(a) $\frac{24}{5}$ (b) $\frac{48}{5}$ (c) 0 (d) - $\frac{24}{5}$

Q.204. The value of $\sqrt{\frac{1-cos300°}{2}}$ is :
RRB NTPC 05/03/2021 (Morning)
(a) 2 (b) $\frac{1}{2}$ (c) $\sqrt{2}$ (d) $\frac{1}{\sqrt{2}}$

Q.205. Find the value of sin($\frac{5\pi}{3}$).
RRB NTPC 07/03/2021 (Morning)
(a) $\frac{\sqrt{3}}{2}$ (b) $\frac{1}{2}$ (c) - $\frac{\sqrt{3}}{2}$ (d) $\frac{1}{\sqrt{2}}$

Q.206. In triangle ABC, lengths of sides opposite respective angles are a = 25, b = 45, c = 30 , then the value of cosA is:
RRB NTPC 07/03/2021 (Evening)
(a) $\frac{20}{27}$ (b) $\frac{23}{27}$ (c) $\frac{25}{27}$ (d) $\frac{21}{27}$

Q.207. ABC is a right-angled triangle, right angled at C. If A = 60° and AC = 20 $\sqrt{3}$ units, then find AB.
RRB NTPC 08/03/2021 (Morning)
(a) 40$\sqrt{3}$units (b) 40 units
(c) 20$\sqrt{3}$ units (d) $\sqrt{3}$ units

Q.208. If $sin\theta + cos\theta = \sqrt{3}cos(90 - \theta)$ $then\ tan\theta$ = ?
RRB NTPC 08/03/2021 (Evening)
(a) $\sqrt{2-1}$ (b) $\frac{1}{\sqrt{3}-1}$
(c) $\sqrt{3}-1$ (d) $\frac{1}{\sqrt{2}-1}$

Q.209. Find the value of sec(2100)°.
RRB NTPC 09/03/2021 (Morning)
(a) 1 (b) 4 (c) 2 (d) 3

Q.210. Find the value of
cos100°cos40° + sin100°sin40°
RRB NTPC 09/03/2021 (Morning)
(a) – $\frac{1}{\sqrt{2}}$ (b) $\frac{1}{\sqrt{2}}$ (c) – $\frac{1}{2}$ (d) $\frac{1}{2}$

Q.211. The minimum value of 9 $sin^2\theta + 10cos^2\theta$ is:
RRB NTPC 09/03/2021 (Evening)
(a) 1 (b) 0 (c) 8 (d) 9

Q.212. If 2xycosθ + $(x^2 - y^2)$sinθ = $x^2 + y^2$, then the value of tanθ is:
RRB NTPC 09/03/2021 (Evening)
(a) $\frac{(x^2-y^2)}{(x^2+y^2)}$ (b) $\frac{(x^2+y^2)}{2xy}$
(c) $\frac{(x^2-y^2)}{2xy}$ (d) $\frac{(y^2-x^2)}{2xy}$

Q.213. tan100° + tan125° + tan100° + tan125° is equal to :
RRB NTPC 11/03/2021 (Morning)
(a) $\frac{1}{2}$ (b) 1 (c) 0 (d) - 1

Q.214. Solve the given equation.
sin21°cos9° - cos84°cos6° = ?
RRB NTPC 11/03/2021 (Morning)
(a) $\frac{1}{2}$ (b) $\frac{1}{4}$ (c) $\frac{1}{8}$ (d) 1

Q.215. sinα = $\frac{1}{\sqrt{5}}$ and cosβ = $\frac{3}{\sqrt{10}}$ then find the value of α + β
RRB NTPC 12/03/2021 (Morning)
(a) 30° (b) 45° (c) 90° (d) 60°

Q.216. If sinθ + cosθ = 1, then the value of tan 2θ is :
RRB NTPC 12/03/2021 (Morning)
(a) $\frac{1}{2}$ (b) - 1 (c) 1 (d) 0

Q.217. Find the value of
sin34° + cos64° - cos4° .
RRB NTPC 12/03/2021 (Evening)
(a) 1 (b) $\frac{1}{2}$ (c) $\frac{3}{4}$ (d) 0

Q.218. If sinθ + cosθ = p and secθ + cosecθ = q , then the value of q(p² - 1) is.
RRB NTPC 13/03/2021 (Morning)
(a) p² (b) p² + 1 (c) 2p (d) p

Q.219. In the triangle ABC, a = 25 , b = 45 and c = 30 . The value of cosA is :
RRB NTPC 13/03/2021 (Evening)
(a) $\frac{21}{27}$ (b) $\frac{25}{27}$ (c) $\frac{20}{27}$ (d) $\frac{23}{27}$

Q.220. If sinA = $\frac{4}{\sqrt{17}}$, then tan2A = ?
(0° < A < 90°)
RRB NTPC 14/03/2021 (Morning)
(a) - $\frac{4}{15}$ (b) - $\frac{8}{15}$ (c) - $\frac{7}{15}$ (d) - $\frac{21}{15}$

Q.221. If cosecA - cotA = 3 then cosecA + cotA = ?
RRB NTPC 14/03/2021 (Morning)
(a) $\frac{1}{3}$ (b) $\frac{3}{2}$ (c) $\frac{1}{2}$ (d) $\frac{1}{5}$

Q.222. If sinA + SinB = x and cosA + cosB = y , then cos(A - B) = ?
RRB NTPC 14/03/2021 (Evening)
(a) $\frac{x^2+y^2+2}{2}$ (b) $\frac{x^2-y^2+2}{2}$
(c) $\frac{x^2-y^2-2}{2}$ (d) $\frac{x^2+y^2-2}{2}$

Q.223. if cos(x + y) = $\frac{1}{2}$ and sin(x - y) = 0, where x and y are positive acute angles and x ≥ y , then x and y are.
RRB NTPC 14/03/2021 (Evening)
(a) 90° and 30° (b) 60° and 60°
(c) 30° and 30° (d) 60° and 45°

Q.224. What is the value of $sin15^o$?
RRB NTPC 15/03/2021 (Morning)
(a) $\frac{\sqrt{6}-\sqrt{2}}{2}$ (b) $\frac{\sqrt{6}-\sqrt{2}}{3}$
(c) $\frac{\sqrt{6}-\sqrt{2}}{4}$ (d) $\frac{3-\sqrt{2}}{4}$

Q.225. What is the value of

cot(15°) - tan(15°) ?
RRB NTPC 15/03/2021 (Evening)
(a) $\frac{\sqrt{3}}{2}$ (b) 2 (c) $2\sqrt{3}$ (d) 4

Q.226. If cosx - 3sinx = $\sqrt{3}$ sinx , then the value of tanx is :
RRB NTPC 15/03/2021 (Evening)
(a) $\frac{3-\sqrt{3}}{6}$ (b) 3 − $\sqrt{3}$ (c) $\sqrt{3}$ (d) 3 + $\sqrt{3}$

Q.227. If tanα = $\frac{5}{3}$ and tanβ = 4 , then α + β is :
RRB NTPC 19/03/2021 (Evening)
(a) 135° (b) 145° (c) 125° (d) 160°

Q.228. If acosθ + bsinθ = 5 and bcosθ - asinθ = 3 , then the relation between a and b is _____.
RRB NTPC 01/04/2021 (Evening)
(a) $\frac{1}{a^2}$ + $\frac{1}{b^2}$ = 2 (b) a² - b² = 16
(c) a² + b² = 34 (d) $\frac{1}{a^2}$ - $\frac{1}{b^2}$ = 1

Q.229. The value of (cosecθ + $cot\theta$)(1 - cosθ) is :
RRB NTPC 05/04/2021 (Morning)
(a) cosθ (b) cosecθ (c) sinθ (d) secθ

Q.230. If secθ + tanθ = 2 - $\sqrt{3}$, then the value of $\sqrt{3}$sinθ + cosθ is :
RRB NTPC 05/04/2021 (Evening)
(a) 2 (b) 3 (c) 1 (d) 4

Q.231. If 3tanθ = 2 , then what will be the value of following ?
$\frac{(\sqrt{13}sin\theta - 3tan\theta)}{(3tan\theta + \sqrt{13}cos\theta)}$
RRB NTPC 05/04/2021 (Evening)
(a) $\frac{1}{\sqrt{13}}$ (b) 0 (c) $\frac{2}{\sqrt{13}}$ (d) $\frac{2}{3}$

Q.232. If $cos^4\theta - sin^4\theta = \frac{3}{5}$, then what will be the value of the following ?
1 - 2sin²θ + 2sinθcosθ
RRB NTPC 05/04/2021 (Evening)
(a) 0 (b) $\frac{9}{5}$ (c) $\frac{7}{5}$ (d) $\frac{8}{5}$

Q.233. If θ is an acute angle and tanθ + cotθ = 2 , then what will be the value of the following ?
$tan^{15}\theta + cot^{20}\theta + 2tan^{20}\theta cot^{15}\theta$
RRB NTPC 05/04/2021 (Evening)
(a) 4 (b) 3 (c) 5 (d) 6

Q.234. If tanA + tanB = p and cotA + cotB = q , then cot(A + B) is:
RRB NTPC 07/04/2021 (Morning)
(a) $\frac{p-q}{pq}$ (b) $\frac{q-p}{pq}$ (c) $\frac{pq}{p-q}$ (d) $\frac{pq}{p+q}$

Q.235. The value of $cos^2 3° + cos^2 4° + cos^2 5° + ... + cos^2 87°$ is :
RRB NTPC 08/04/2021 (Morning)
(a) $\frac{55}{2}$ (b) $\frac{65}{2}$ (c) $\frac{75}{2}$ (d) $\frac{85}{2}$

Q.236. If (1 - cosP)(1 + cosP) = $\frac{3}{4}$ and P is an acute angle, then find the value of secP .
RRB NTPC 23/07/2021 (Morning)
(a) $\frac{\sqrt{7}}{2}$ (b) $\frac{1}{2}$ (c) 2 (d) $\frac{\sqrt{2}}{7}$

Q.237. If 2(cosθ + $sec\theta$) = 5, What is the value of $sec^2\theta + cos^2\theta$?
RRB NTPC 23/07/2021 (Evening)
(a) $\frac{4}{17}$ (b) $\frac{25}{2}$ (c) $\frac{17}{4}$ (d) $\frac{5}{4}$

Q.238. If x = 3cosAcosB, y = 3cosAsinB and z = 3sinA , find the value of $x^2 + y^2 + z^2$.
RRB NTPC 23/07/2021 (Evening)
(a) 6 (b) 3 (c) 12 (d) 9

Q.239. What is the value of $sin^2 5° + sin^2 10° + sin^2 80° + sin^2 85°$?
RRB NTPC 23/07/2021 (Evening)
(a) 0 (b) 2 (c) 1 (d) 3

Q.240. If secθ + tanθ = 2+ $\sqrt{3}$, then cosθ = ?
RRB NTPC 24/07/2021 (Morning)
(a) $\sqrt{3}$ (b) 2 (c) $\frac{1}{2}$ (d) $\frac{\sqrt{3}}{2}$

Q.241. What is the value of tan(15°) ?
RRB NTPC 24/07/2021 (Morning)
(a) 2 - $\sqrt{3}$ (b) $\sqrt{3}$ - 2 (c) - $\sqrt{3}$ - 2 (d) 2 + $\sqrt{3}$

Q.242. The value of tan75° - cot75° is equal to :
RRB NTPC 24/07/2021 (Evening)
(a) 2 - $\sqrt{3}$ (b) 1 + 2$\sqrt{3}$ (c) 2$\sqrt{3}$ (d) 2 + $\sqrt{3}$

Q.243. Find the value of
cos1°cos2°cos3°.....cos89°cos90°
RRB NTPC 26/07/2021 (Morning)
(a) 1 (b) $\frac{1}{\sqrt{2}}$ (c) 0 (d) $\frac{1}{2}$

Q.244. If tanθ = − $\frac{4}{3}$, them sinθ is:
RRB NTPC 26/07/2021 (Evening)
(a) $\frac{4}{5}$ but not − $\frac{4}{5}$ (b) − $\frac{4}{5}$ or $\frac{4}{5}$
(c) − $\frac{4}{5}$ but not $\frac{4}{5}$ (d) $\frac{5}{6}$ or $\frac{6}{5}$

Q.245. The value of
$\frac{tan1^o tan2^o tan3^o ..... tan89^o}{tan}$ is equal to :
RRB NTPC 31/07/2021 (Morning)
(a) Not defined (b) 0 (c) 1 (d) 90

Q.246. If tanθ = $\frac{\sqrt{3}+1}{2}$,
then the value of 2$\sqrt{3}$cotθ + 1 is :
RRB NTPC 31/07/2021 (Evening)
(a) $\frac{5\sqrt{3}+1}{\sqrt{3}+1}$ (b) $\frac{2\sqrt{3}-1}{2}$
(c) $\frac{5\sqrt{3}-1}{\sqrt{3}+1}$ (d) $\frac{5\sqrt{3}-1}{\sqrt{3}-1}$

RRB JE
(22/05/2019 to 28/06/2019)

Q.247. Find the value of
sin $\frac{7\pi}{4}$ sin$\frac{\pi}{4}$ sin$\frac{3\pi}{4}$ sin$\frac{5\pi}{4}$.
RRB JE 22/05/2019 (Afternoon)
(a) $\frac{1}{4}$ (b) $\frac{3}{16}$ (c) $\frac{1}{8}$ (d) $\frac{1}{16}$

Q.248. If 0 < θ ≤ 90°, solve for 'θ' where cos^2 θ - 3 cos θ + 2 = 2sin^2 θ.
RRB JE 22/05/2019 (Afternoon)
(a) 60° (b) 45° (c) 30° (d) 90°

Q.249. Find the value of
sin 120° sin 240° sin 270°.
RRB JE 22/05/2019 (Afternoon)
(a) - $\frac{1}{2}$ (b) - $\frac{1}{8}$ (c) $\frac{3}{4}$ (d) $\frac{1}{8}$

Q.250. Simplify:
tan (60° - θ) - cot (30° + θ)
RRB JE 22/05/2019 (Evening)
(a) $\frac{2+\sqrt{3}}{\sqrt{3}}$ (b) $\sqrt{3} + \frac{1}{\sqrt{3}}$
(c) 0 (d) 2$\sqrt{3}$

Q.251. If tan 2A = cot(A - 18°) and 2A is an acute angle, then find 'A'.
RRB JE 22/05/2019 (Evening)
(a) 36° (b) 28° (c) 18° (d) 24°

Q.252. Simplify:
cos 18° + cos 162° + sin 126° + sin 234°
RRB JE 23/05/2019 (Evening)
(a) 2 (b) 1 (c) - 2 (d) 0

Q.253. Find the value of sin 75° .
RRB JE 23/05/2019 (Evening)
(a) $\frac{\sqrt{6}-\sqrt{2}}{4}$ (b) $\frac{\sqrt{6}+\sqrt{2}}{4}$
(c) $\frac{\sqrt{3}+1}{2}$ (d) $\frac{\sqrt{3}-1}{2\sqrt{2}}$

Q.254. Find the value of sin(180° - θ) cos (90° - θ) − cos (180° - θ) sin (90° - θ).
RRB JE 24/05/2019 (Evening)
(a) cosθ (b) 1 (c) tanθ (d) 0

Q.255. Simplify : cos 5° + cos 24° + cos 175° + cos 204° + cos 300°
RRB JE 25/05/2019 (Morning)
(a) - $\frac{1}{2}$ (b) 0 (c) $\frac{1}{2}$ (d) 1

Q.256. In a right triangle, the sides are in the ratio 1 : 1 : $\sqrt{2}$.
Find cos A cos B - sin A sin B
RRB JE 25/05/2019 (Morning)
(a) 0 (b) $\frac{1}{2}$ (c) $\frac{1}{\sqrt{2}}$ (d) 1

Q.257. Find the value of cos(A + B), if tan A = $\frac{3}{4}$ and tan B = $\frac{5}{12}$ and A and B are in quadrant I.
RRB JE 25/05/2019 (Afternoon)
(a) $\frac{33}{65}$ (b) $\frac{16}{65}$ (c) 1 (d) $\frac{15}{48}$

Q.258. $\frac{Cos\theta}{1-Sin\theta} + \frac{Cos\theta}{1+Sin\theta}$ = 4
find the value of 'θ', where 'θ' is acute.
RRB JE 28/05/2019 (Afternoon)
(a) 45° (b) 30° (c) 75° (d) 60°

Q.259. If A + B = 90° then find, $\frac{\sqrt{tan\,A\,tan\,B + tanA\ \ cot\,B}}{Sin\,A\,Sec\,B}$
RRB JE 28/05/2019 (Afternoon)
(a) tan^2 A (b) sec^2 A
(c) tan A (d) sec A

Q.260. If x = a sec θ + b tan θ and y = a tanθ + b sec θ, then find $x^2 - y^2$.
RRB JE 29/05/2019 (Evening)
(a) $a^2 + b^2$ (b) $\sqrt{a^2 + b^2}$
(c) a + b (d) $a^2 - b^2$

Q.261. Evaluate:
$(\frac{sin\,47°}{cos43°})^2 + (\frac{cos\,43°}{sin47°})^2 - 4\,cos^2 45°$
RRB JE 31/05/2019 (Morning)
(a) - 3 (b) 2 (c) 0 (d) 1

Q.262. If sinx = $\frac{m}{\sqrt{1+m^2}}$ then find 'tan x'.
RRB JE 31/05/2019 (Afternoon)
(a) $\frac{m^2}{1+m^2}$ (b) $\sqrt{1 + m^2}$
(c) m (d) $\frac{m^2-1}{m^2+1}$

Q.263. Find the value of
$\frac{sin\,30°17'}{cos\,59°43'} - \frac{cosec\,32°}{sec\,58°}$
RRB JE 31/05/2019 (Evening)
(a) 2 (b) $\frac{1}{2}$ (c) 0 (d) 1

Q.264. Simplify:
$\frac{tanA}{(1+tan^2A)^2} + \frac{cotA}{(1+cot^2A)^2}$
RRB JE 31/05/2019 (Evening)
(a) 2 sinA cosA (b) sinA - cosA
(c) sinA cosA (d) (sinA + cosA)²

Q.265.Simplify: sin(30° - A) + sin(30° + A)
RRB JE 01/06/2019 (Morning)
(a) 2 sin A (b) 2 cos A
(c) sin A (d) cos A

Q.266. Find (1 - $sin^2\theta$) ($tan^2\theta$ + 1) - 1.
RRB JE 01/06/2019 (Afternoon)
(a) 0 (b) 2 (c) $cosec^2\,\theta$ (d) -2

Q.267. If cosec α = √2
evaluate $\frac{2\,sin^2\,\alpha + 3\,cos^2\,\alpha}{cosec^2\,\alpha + cot^2\,\alpha}$
RRB JE 01/06/2019 (Evening)
(a) $\frac{5}{6}$ (b) $\frac{5}{2}$ (c) $\frac{5}{12}$ (d) $\frac{5}{3}$

Q.268. Simplify: $\frac{1}{(sec\,\theta - tan\,\theta)}$
RRB JE 01/06/2019 (Evening)
(a) sec θ + tan θ (b) cosec θ - cot θ
(c) cos θ + sin θ (d) $sec^2\,\theta$ - $tan^2\,\theta$

Q.269. Simplify: $\frac{1}{(cosec\theta - cot\theta)}$
RRB JE 02/06/2019 (Afternoon)
(a) cosecθ - cotθ (b) $cosec^2\theta + cot^2\theta$
(c) cosecθ + cotθ (d) sinθ + cos θ

Q.270. If A and B are complementary angles, then Find the value of cos A cos B - sin A sin B.
RRB JE 26/06/2019 (Evening)
(a) - 1 (b) 0 (c) $\frac{1}{2}$ (d) 1

RRB ALP Tier - 2
(21/01/2019 to 08/02/2019)

Q.271. What will be the value of cos4x:
ALP Tier II 21/01/2019 (Afternoon)
(a) 1-4sin^2 x cos^2x (b) 1 - 5sin^2x cos^2x
(c) 1 - 3sin^2x cos^2x (d)1 - 8sin^2 x cos^2x

Q.272. cos(45°+ x) + cos(45°- x) = ?What will be the value of
ALP Tier II 21/01/2019 (Afternoon)
(a) $\sqrt{3}$ cotx (b) $\sqrt{2}$ cosx
(c) $\sqrt{3}$ cosx (d) $\sqrt{3}$sinx

Q.273.if sinx = $\frac{5}{13}$, then what is the value of cotx?
ALP Tier II 21/01/2019 (Afternoon)
(a) $\frac{7}{13}$ (b) $\frac{5}{12}$ (c) $\frac{12}{5}$ (d) $\frac{13}{5}$

RRB ALP Tier - 1
(09/08/2018 to 31/08/2018)

Q.274. If $cot^4\theta + cot^2\theta$ = 3, then $cosec^4\theta - cosec^2\theta$ = ?
RRB ALP 09/08/2018 (Afternoon)
(a) 1 (b) 0 (c) 2 (d) 3

Q.275. If 2sec^2x - tan^2x = 5 and 0° ≤ x ≤ 90°, then x = ?
RRB ALP 10/08/2018 (Morning)
(a) 30° (b) 90° (c) 45° (d) 60°

Q.276. If tanα = $\sqrt{2}$ - 1 than the value of tanα - cotα = ?
RRB ALP 13/08/2018 (Evening)
(a) $\sqrt{2}$ + 1 (b) 1 (c) -2 (d) 2$\sqrt{2}$

Q.277. If $tan^4\theta + tan^2\theta$ = 2, then $sec^4\theta - sec^2\theta$ = ?
RRB ALP 14/08/2018 (Evening)
(a) 2 (b) 1 (c) 0 (d) 3

Q.278.
Sinθ Cos(90° - θ) + Cosθ Sin(90° - θ) = ?
RRB ALP 20/08/2018 (Evening)
(a) 2 (b) 0 (c) -1 (d) 1

Q.279. If sin x + cos x = $\sqrt{2}$ sin x then the value of tan x is:
RRB ALP 21/08/2018 (Afternoon)
(a) $\sqrt{2}$ - 1 (b) $\sqrt{2}$ + 1 (c) 1 (d) $\sqrt{2}$

Q.280. A right-angled triangle ABC is right-angled at B, and tan A = $\frac{4}{3}$.
If AC = 25 cm, the length of BC is:
RRB ALP 31/08/2018 (Afternoon)
(a) 18.75 cm (b) 20 cm
(c) 33.3 cm (d) 24 cm

Q.281. If 3cos^2 x - 2sin^2 x = - 0.75 and 0° ≤ x ≤ 90°, Then x = ?
RRB ALP 31/08/2018 (Evening)
(a) 45° (b) 60° (c) 30° (d) 90°

Answer Key :-

1.(a)	2.(b)	3.(d)	4.(b)
5.(d)	6.(b)	7.(a)	8.(c)
9.(a)	10.(d)	11.(c)	12.(a)
13.(a)	14.(d)	15.(b)	16.(b)
17.(c)	18.(c)	19.(a)	20.(a)
21.(d)	22.(d)	23.(b)	24.(b)
25.(d)	26.(c)	27.(c)	28.(b)
29.(b)	30.(a)	31.(b)	32.(b)
33.(a)	34.(a)	35.(d)	36.(c)
37.(b)	38.(c)	39.(d)	40.(d)
41.(a)	42.(a)	43.(b)	44.(c)
45.(c)	46.(c)	47.(c)	48.(d)
49.(a)	50.(c)	51.(b)	52.(c)
53.(a)	54.(b)	55.(c)	56.(a)
57.(b)	58.(b)	59.(a)	60.(a)
61.(b)	62.(d)	63.(b)	64.(c)
65.(d)	66.(a)	67.(d)	68.(b)
69.(b)	70.(c)	71.(d)	72.(d)
73.(a)	74.(b)	75.(c)	76.(b)

77.(b)	78.(b)	79.(d)	80.(a)
81.(a)	82.(b)	83.(a)	84.(b)
85.(b)	86.(c)	87.(b)	88.(a)
89.(c)	90.(a)	91.(c)	92.(d)
93.(d)	94.(b)	95.(c)	96.(c)
97.(a)	98.(d)	99.(a)	100.(a)
101.(c)	102.(a)	103.(d)	104.(b)
105.(a)	106.(d)	107.(c)	108.(d)
109.(a)	110.(c)	111.(d)	112.(b)
113.(a)	114.(a)	115.(c)	116.(c)
117.(c)	118.(a)	119.(b)	120.(a)
121.(c)	122.(a)	123.(d)	124.(a)
125.(d)	126.(d)	127.(d)	128.(a)
129.(b)	130.(b)	131.(a)	132.(a)
133.(a)	134.(c)	135.(b)	136.(b)
137.(c)	138.(c)	139.(d)	140.(a)
141.(a)	142.(d)	143.(c)	144.(c)
145.(c)	146.(a)	147.(a)	148.(a)
149.(b)	150.(a)	151.(b)	152.(a)
153.(d)	154.(a)	155.(d)	156.(c)
157.(d)	158.(d)	159.(b)	160.(d)
161.(d)	162.(a)	163.(d)	164.(b)
165.(d)	166.(c)	167.(d)	168.(c)
169.(d)	170.(d)	171.(a)	172.(a)
173.(c)	174.(d)	175.(d)	176.(b)
177.(c)	178.(a)	179.(c)	180.(b)
181.(a)	182.(c)	183.(c)	184.(a)
185.(d)	186.(c)	187.(d)	188.(b)
189.(a)	190.(c)	191.(b)	192.(a)
193.(c)	194.(b)	195.(c)	196.(d)
197.(d)	198.(a)	199.(d)	200.(b)
201.(c)	202.(d)	203.(c)	204.(b)
205.(c)	206.(b)	207.(a)	208.(b)
209.(c)	210.(d)	211.(d)	212.(c)
213.(b)	214.(b)	215.(b)	216.(d)
217.(d)	218.(c)	219.(d)	220.(b)
221.(a)	222.(d)	223.(c)	224.(c)
225.(c)	226.(a)	227.(a)	228.(c)
229.(c)	230.(a)	231.(b)	232.(c)
233.(a)	234.(b)	235.(d)	236.(c)
237.(c)	238.(d)	239.(b)	240.(c)
241.(a)	242.(c)	243.(c)	244.(b)
245.(c)	246.(a)	247.(a)	248.(d)
249.(c)	250.(c)	251.(a)	252.(d)
253.(b)	254.(b)	255.(c)	256.(a)
257.(a)	258.(d)	259.(d)	260.(d)

261.(c)	262.(c)	263.(c)	264.(c)
265.(d)	266.(a)	267.(a)	268.(a)
269.(c)	270.(b)	271.(d)	272.(b)
273.(c)	274.(d)	275.(d)	276.(c)
277.(a)	278.(d)	279.(b)	280.(b)
281.(b)			

Solutions:-

Sol.1.(a) $Sec\ 4A = Cosec(3A - 50°)$
$Sec\ 4A = Sec\ [90° - (3A - 50)]$
$Sec\ 4A = Sec\ (140° - 3A)$
$7A = 140° \Rightarrow A = 20°$
So, A + 75° = 20° + 75° = 95°

Sol.2.(b)

$$\frac{sin^2 10° + sin^2 20° + sin^2 30° + sin^2 40° + sin^2 50°}{cos^2 20° + cos^2 40° + cos^2 50° + cos^2 70° + cot^2 45°} + \frac{sin^2 60° + sin^2 70° + sin^2 80° + sin^2 90°}{cos^2 20° + cos^2 40° + cos^2 50° + cos^2 70° + cot^2 45°}$$

$$= \frac{(sin^2 10° + sin^2 80°) + (sin^2 20° + sin^2 70°)}{(cos^2 20° + cos^2 70°) + (cos^2 40° + cos^2 50°) + cot^2 45°} + \frac{(sin^2 30° + sin^2 60°) + (sin^2 40° + sin^2 50°) + sin^2 90°}{(cos^2 20° + cos^2 70°) + (cos^2 40° + cos^2 50°) + cot^2 45°}$$

$$= \frac{(sin^2 10° + cos^2 10°) + (sin^2 20° + cos^2 20°)}{(cos^2 20° + sin^2 20°) + (cos^2 40° + sin^2 40°) + cot^2 45°} + \frac{(sin^2 30° + cos^2 30°) + (sin^2 40° + cos^2 40°) + sin^2 90°}{(cos^2 20° + sin^2 20°) + (cos^2 40° + sin^2 40°) + cot^2 45°}$$

$$= \frac{1 + 1 + 1 + 1 + 1}{1 + 1 + 1} = \frac{5}{3}$$

Sol.3.(d)

$$\frac{1}{(1 + cot^2 x)^2} + \frac{tan^2 x}{(1 + tan^2 x)^2} + \frac{1}{1 + tan^2 x}$$

$$= \frac{1}{cosec^4 x} + \frac{tan^2 x}{sec^4 x} + \frac{1}{sec^2 x}$$

$$= sin^4 x + sin^2 x.cos^2 x + cos^2 x$$

$$= sin^2 x(sin^2 x + cos^2 x) + cos^2 x$$

$$= sin^2 x + cos^2 x = 1$$

Sol.4.(b) $\frac{4cos\theta + 2sin\theta}{2sin\theta - cos\theta}$

Dividing numerator and denominator by $cos\theta$, and put $\tan\theta = 4$

$$\frac{4 + 2\ tan\theta}{2tan\theta - 1} = \frac{4 + 2 \times 4}{2 \times 4 - 1} = \frac{4 + 8}{8 - 1} = \frac{12}{7}$$

Sol.5.(d)

$$\frac{sin^2\theta - sin^4\theta + 1}{1 - sin^2\theta} + \frac{1 - tan^2\theta - tan^4\theta}{1 + tan^2\theta}$$

$$= \frac{sin^2\theta(1 - sin^2\theta) + 1}{1 - sin^2\theta} + \frac{1 - tan^2\theta(1 + tan^2\theta)}{1 + tan^2\theta}$$

$$= \frac{sin^2\theta.cos^2\theta + 1}{cos^2\theta} + \frac{1 - tan^2\theta.sec^2\theta}{sec^2\theta}$$

$= sin^2\theta + sec^2\theta + cos^2\theta - tan^2\theta$
$= 1 + 1 = 2$

Sol.6.(b)

$$2 - \frac{sin^2\alpha}{1 - cos\alpha} + \frac{1 - cos\alpha}{sin\alpha} - \frac{sin\alpha}{1 + cos\alpha}$$

$$\Rightarrow 2 - \frac{sin^2\alpha\ (1 + cos\alpha)}{sin^2\alpha} - \frac{sin\ \alpha\ (1 - cos\alpha)}{sin^2\alpha} + \frac{(1 - cos\alpha)}{sin\ \alpha}$$

$$\Rightarrow 2 - (1 + cos\alpha) - \frac{(1 - cos\alpha)}{sin\ \alpha} + \frac{(1 - cos\alpha)}{sin\ \alpha} \Rightarrow (1 - cos\alpha)$$

Sol.7.(a) $cos^4\theta - sin^4\theta = k$

$$\Rightarrow (cos^2\theta)^2 - (sin^2\theta)^2$$

$$= (cos^2\theta + sin^2\theta)(cos^2\theta - sin^2\theta)$$

$$\Rightarrow (cos^2\theta - sin^2\theta) = k$$

Now, $\frac{1 + k}{1 - k} = \frac{1 + cos^2\theta - sin^2\theta}{1 - cos^2\theta + sin^2\theta}$

$$= \frac{2cos^2\theta}{2sin^2\theta} = cot^2\theta$$

Sol.8.(c)

$$\frac{\sqrt{1 - 2sin\theta cos\theta} + \sqrt{1 + 2sin\theta cos\theta}}{2tan\theta}$$

$$= \frac{\sqrt{sin^2\theta + cos^2\theta - 2sin\theta cos\theta}}{2tan\theta} + \frac{\sqrt{sin^2\theta + cos^2\theta + 2sin\theta cos\theta}}{2tan\theta}$$

$$= \frac{sin\theta - cos\theta + sin\theta + cos\theta}{2tan\theta}$$

$$= \frac{2sin\theta}{2tan\theta} = cos\theta$$

Sol.9.(a)
x = (sec θ - cos θ) (cot θ + tan θ) and
y = secθ (sec θ + tan θ)(1 − sinθ)
xy = (sec θ - cos θ) (cot θ + tan θ) × secθ (sec θ + tan θ)(1 − sinθ)

$$= (\frac{1}{cos\theta} - cos\theta)(\frac{cos\theta}{sin\theta} + \frac{sin\theta}{cos\theta}) \times \frac{1}{cos\theta}(\frac{1}{cos\theta} + \frac{sin\theta}{cos\theta})(1 - sin\theta)$$

$$= \frac{sin^2\theta}{cos\theta} \times \frac{1}{sin\theta cos\theta} \times \frac{1}{cos\theta} \times \frac{cos^2\theta}{cos\theta}$$

$$xy = \frac{sin\theta}{cos^2\theta} = \frac{sin\theta}{cos\theta} \times \frac{1}{cos\theta} = tan\theta\ sec\theta$$

Sol.10.(d) $\frac{sin\theta\ (1 + cos\theta)}{1 + cos\theta - sin^2\theta}$ × (secθ + tanθ)(1- sinθ)

$$= \frac{sin\theta\ (1 + cos\theta)}{cos\theta + cos^2\theta} \times (\frac{1}{cos\theta} + \frac{sin\theta}{cos\theta})(1 - sin\theta)$$

$$= \frac{sin\theta\ (1 + cos\theta)}{cos\theta\ (1 + cos\theta)} \times (\frac{(1 + sin\theta)}{cos\theta})$$

$$(1 - sin\theta) \Rightarrow \frac{sin\theta}{cos\theta} \times (\frac{1 - sin^2\theta}{cos\theta})$$

$= sin\theta \times (\frac{cos^2\theta}{cos^2\theta}) = sin\theta$

Sol.11.(c) $7\sin^2x + 3\cos^2x = 4$
$4\sin^2x + 3(\sin^2x + \cos^2x) = 4$
since, $(\sin^2x + \cos^2x = 1)$
$4\sin^2x = 1 \Rightarrow \sin x = \frac{1}{2}$ so x= 30°

Now, $\cot30° + \tan30° = \sqrt{3} + \frac{1}{\sqrt{3}} = \frac{4}{\sqrt{3}}$

Sol.12.(a) We know that,
$\cos2\theta = 1 - 2\sin^2\theta = 2\cos^2\theta - 1$
Now , $\frac{(sin\ 70° - 2\ sin^3\ 70°)}{(2\ cos^3\ 70° - cos\ 70°)}$
$= \frac{sin70°(1 - 2sin^270°)}{cos70°(2cos^270° - 1)}$
$\Rightarrow \frac{sin\ 70° \times cos\ 140°}{cos\ 70° \times cos\ 140°} = \tan 70°$

Sol.13.(a) $\cos\theta = \frac{x}{sin\theta}$
$\Rightarrow x = sin\theta.cos\theta$
$(\sin^2\theta+\cos^2\theta)^3 = sin^6\theta + cos^6\theta + 3sin^2\theta.cos^2\theta(sin^2\theta + cos^2\theta)$
$\Rightarrow 1 = \sin^6\theta + cos^6\theta + 3sin^2\theta.cos^2\theta$
$\Rightarrow 1 = \sin^6\theta + cos^6\theta + 3x^2$
$\Rightarrow sin^6\theta + cos^6\theta = 1 - 3x^2$

Sol.14.(d) a secA + b tanA + c = 0
a'secA + b'tanA + c' = 0
On solving the equations , we get
$\frac{sec\ A}{bc' - b'c} = \frac{tan\ A}{ca' - ac'} = \frac{1}{ab' - ba'}$
$\sec A = \frac{bc' - b'c}{ab' - ba'}$ and $\tan A = \frac{ca' - ac'}{ab' - ba'}$
Using identity $\rightarrow sec^2A - tan^2A = 1$
$\left(\frac{bc' - b'c}{ab' - ba'}\right)^2 - \left(\frac{ca' - ac'}{ab' - ba'}\right)^2 = 1$
$(bc' - b'c)^2 - (ca' - c'a)^2$
$= (ab' - ba')^2$

Sol.15.(b)
$\frac{Sin\ A - Sin\ B}{Cos\ A + Cos\ B} + \frac{Cos\ A - Cos\ B}{Sin\ A + Sin\ B}$
$= \frac{sin^2A - sin^2B + cos^2A - cos^2B}{(Cos\ A + Cos\ B) \times (Sin\ A + Sin\ B)}$
$= \frac{1 - 1}{(Cos\ A + Cos\ B) \times (Sin\ A + Sin\ B)} = 0$

Sol.16.(b) asinq = $bcosq$
Put, q = 45° ⇒ a = b.....(1)
$asin^3q + bcos^3q = sinq.\ cosq$
$\frac{a}{2\sqrt{2}} + \frac{a}{2\sqrt{2}} = \frac{1}{2}$ (from eq . (1))
$\Rightarrow a = \frac{1}{\sqrt{2}} \Rightarrow a^2 + b^2 = \frac{1}{2} + \frac{1}{2} = 1$

Sol.17.(c) $p\sin^2\beta + q\cos^2\beta = r$
$p\sin^2\beta + q(1 - \sin^2\beta) = r$
$p\sin^2\beta + q - q\sin^2\beta = r$
$\sin^2\beta (p - q) = r - q$
$\frac{(p - q)}{cosec^2\beta} = r - q \Rightarrow cosec^2\beta = \frac{p - q}{r - q}$
We know that ,
$cosec^2\beta = 1 + cot^2\beta$
Now, $1 + cot^2\beta = \frac{p - q}{r - q}$
$cot^2\beta = \frac{p - q}{r - q} - 1 \Rightarrow \frac{p - q - r + q}{r - q}$
Therefore, $cot^2\beta = \frac{p - r}{r - q}$

Sol.18.(c)
$(\sin\theta + cosec\theta)^2 + (\cos\theta + sec\theta)^2$
$\Rightarrow \sin^2\theta + cosec^2\theta + 2.Sin\theta.Cosec\theta + \cos^2\theta + sec^2\theta + 2.cos\theta.sec\theta$
$= \sin^2\theta + \cos^2\theta + cosec^2\theta + sec^2\theta + 2 + 2$
$= 1 + 1 + cot^2\theta + 1 + tan^2\theta + 2 + 2$
$= 7 + cot^2\theta + tan^2\theta$

Sol.19.(a) We know that ,
Sin (90° - θ) = cosθ , tan(90° - θ) = cotθ and sec(90° - θ) = cosecθ
⇒ cosec(47° + θ) - sec(43° - θ) + tan(61° + θ) - cot(29° - θ) + sin(45° + θ) - cos(45° - θ)
⇒ sec{90° - (47° + θ)} - sec(43° - θ) + cot{90° - (61° + θ)} - cot(29° - θ) + cos{90°- (45° + θ)} - cos(45° - θ)
⇒ sec(43° - θ) - sec(43° - θ) + cot(29° - θ) - cot(29° - θ) + cos(45° - θ)- cos(45° - θ) = 0

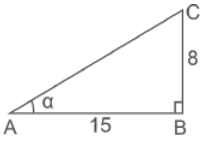
Sol.20.(a) $cos\theta = \frac{12}{13} = \frac{B}{H}$
$\Rightarrow p = \sqrt{13^2 - 12^2} = 5$
$\Rightarrow \frac{13\ sin\ \theta + 12\ sec\ \theta}{12\ tan\ \theta + 5\ cosec\ \theta}$
$= \frac{13 \times \frac{5}{13} + 12 \times \frac{13}{12}}{12 \times \frac{5}{12} + 5 \times \frac{13}{5}} = \frac{5 + 13}{5 + 13} = 1$

Sol.21.(d) $\sin^2x + 3\cos^2x = 2$
$\Rightarrow \sin^2x + 3(1 - \sin^2x) = 2$
$\Rightarrow \sin^2x + 3 - 3\sin^2x = 2$
$\Rightarrow 3\sin^2x - \sin^2x = 1 \Rightarrow 2\sin^2x = 1$
$\Rightarrow \sin^2x = \frac{1}{2} \Rightarrow \sin x = \frac{1}{\sqrt{2}} \Rightarrow x = 45°$
$Cosecx = cosec45° = \sqrt{2}$

Sol.22.(d)
$\frac{505}{cot^2\theta} - \frac{505}{cos^2\theta} + \frac{15tan\ \theta\ cos\theta}{sin\ \theta}$
$505\tan^2\theta - 505\sec^2\theta + 15\tan\theta.\cot\theta$
$\Rightarrow - 505(\sec^2\theta - \tan^2\theta) + 15$
$\Rightarrow - 505 + 15 = - 490$

Sol.23.(b) We know,
$\Rightarrow \sec^2\theta - \tan^2\theta = 1$
$\Rightarrow \sec\theta + \tan\theta = p$.....(i)
$\Rightarrow \sec\theta - \tan\theta = 1/p$.....(ii)
On solving equation (i) and (ii)
$\Rightarrow \sec\theta = \frac{p^2 + 1}{2p} \Rightarrow 4\sec\theta = \frac{2(1 + p^2)}{p}$

Sol.24.(b)



Largest side = $\sqrt{15^2 + 8^2} = 17$
$\cos\alpha = \frac{15}{17}$, $\cot\alpha = \frac{15}{8}$
$\cos\alpha + \cot\alpha = \frac{15}{17} + \frac{15}{8} = \frac{375}{136}$

Sol.25.(d)
$\sin2x = \cos60° \cos30° + \sin60° \sin30°$
$\sin2x = \frac{1}{2} \times \frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} \times \frac{1}{2}$
$\sin2x = \frac{\sqrt{3}}{4} + \frac{\sqrt{3}}{4} \Rightarrow \sin2x = \frac{\sqrt{3}}{2}$
$\sin2x = \sin 60° \Rightarrow x = 30°$
$\tan x + \sec x = \tan30° + \sec30°$
$= \frac{1}{\sqrt{3}} + \frac{2}{\sqrt{3}} = \sqrt{3}$

Sol.26.(c) As we know,
$\cot15° = 2 + \sqrt{3}$ and $\cot75° = 2 - \sqrt{3}$,
$\tan45° = 1$
So,
$= 5\sin14°\sec76° + 3\cot15° \times \cot75° + 2\tan45°$
$= 5\cos76°\sec76° + 3\cot15° \times \cot75° + 2\tan45°$
$= 5 \times 1 + 3 \times (2 + \sqrt{3}) \times (2 - \sqrt{3}) + 2 \times 1$
$= 5 + 3 + 2 = 10$

Sol.27.(c) As we know the short formula,
$\cos\theta°\cos2\theta°\cos4\theta° = \frac{1}{4}\cos3\theta°$
$= \cos20°\cos40°\cos80°$
$= \cos20°\cos(2 \times 20°)\cos(4 \times 20°)$
$= \cos20°\cos(2 \times 20°)\cos(4 \times 20°) = \frac{1}{4}$
$= \cos(3 \times 20°) = \frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$

Sol.28.(b) As we know,
$sin^6\theta + cos^6\theta = 1 - 3sin^2\theta cos^2\theta$ and
$sin^4\theta + cos^4\theta = 1 - 2sin^2\theta cos^2\theta$
$2(sin^6\theta + cos^6\theta) - 3(sin^4\theta + cos^4\theta)$
$= 2(1 - 3sin^2\theta cos^2\theta) - 3(1 - 2sin^2\theta cos^2\theta)$
$= 2 - 3 = - 1$

Sol.29.(b) We know, $sec^2\theta - tan^2\theta = 1$
$\Rightarrow 25x^2 - \frac{25}{x^2} = 1 \Rightarrow 25(x^2 - \frac{1}{x^2}) = 1$
$\Rightarrow x^2 - \frac{1}{x^2} = \frac{1}{25}$
Hence, $10(x^2 - \frac{1}{x^2}) = \frac{10}{25} = \frac{2}{5}$

Sol.30.(a) $\sin15° = \sin(45° - 30°)$
$= \sin45° \cos30° - \cos45° \sin30°$

$= \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2} - \frac{1}{\sqrt{2}} \times \frac{1}{2} = \frac{\sqrt{3}-1}{2\sqrt{2}}$

Sol.31.(b) a + b + c = 2s

a + b = 2s - c , a + c = 2s - b

From cosine rule Cos A = $\frac{b^2+c^2-a^2}{2bc}$

$2sin^2(\frac{A}{2})$ = 1 - cos A

$\Rightarrow 2sin^2(\frac{A}{2}) = 1 - (\frac{b^2+c^2-a^2}{2bc})$

$= \frac{a^2+2bc-b^2-c^2}{2bc} = \frac{a^2-(b-c)^2}{2bc}$

$\Rightarrow 2sin^2(\frac{A}{2}) = \frac{[a+(b-c)][a-(b-c)]}{2bc}$

$\Rightarrow 2sin^2(\frac{A}{2}) = \frac{(2s-2c)(2s-2b)}{2bc}$

$\Rightarrow 2sin^2(\frac{A}{2}) = \frac{4(s-c)(s-b)}{2bc}$

$\Rightarrow sin(\frac{A}{2}) = \sqrt{\frac{(s-c)(s-b)}{bc}}$

Sol.32.(b)

tanA + tan2A + tan3A = tanAtan2Atan 3A

$\Rightarrow$ tanA + tan2A = tanAtan2Atan3A - tan3A

$\Rightarrow$ tanA + tan2A = - tan3A(1 - tanAtan2A)

$\Rightarrow$ (tanA + tan2A)/(1 - tanAtan2A)

= - tan3A

[Since tan(A + B) = $\frac{tanA+tanB}{1-tanAtanB}$]

then, tan3A = – tan3A $\Rightarrow$ 2tan3A = 0

tan3A = 0 = tan(nπ),

$\Rightarrow$ 3A = nπ , A = $\frac{n\pi}{3}$

For n = 1 , A = $\frac{\pi}{3}$ and for n = 2 , A = $\frac{2\pi}{3}$

By option,We satisfy the given equation for n = 1 and n = 2 in the value of A.

Sol.33.(a) A, B and C are the interior angles of a Δ ABC ,

$= \frac{cos^2(\frac{B+C}{2}) + cos^2\frac{A}{2}}{sec^2\frac{C}{2} - cot^2(\frac{A+B}{2})}$

$= \frac{cos^2(\frac{180^0-A}{2}) + cos^2\frac{A}{2}}{sec^2\frac{C}{2} - cot^2(\frac{180^0-C}{2})}$

$= \frac{sin^2\frac{A}{2} + cos^2\frac{A}{2}}{sec^2\frac{C}{2} - tan^2\frac{C}{2}} = 1$

Sol.34.(a) $x^2 + y^2 + z^2 = (rsinAcosC)^2 + (rsinAsinC)^2 + (rcosA)^2$

$= r^2sin^2A(cos^2C + sin^2C) + r^2cos^2A$

$= r^2sin^2A + r^2cos^2A$

$= r^2(sin^2A + cos^2A) = r^2$

Sol.35.(d) sin(A + B) = $\frac{\sqrt{3}}{2}$ = sin 60°

$\Rightarrow$ A + B = 60° ------- (1)

cos(A - B) = $\frac{\sqrt{3}}{2}$ = cos30°

$\Rightarrow$ A - B = 30° ------- (2)

On solving equation (1) and (2)

We get , A = 45° and B = 15°

Sol.36.(c) sin(3x - 20)° = cos (20 - 3y)°

$\Rightarrow$ cos(90° - (3x - 20°)) = cos (20 - 3y)°

$\Rightarrow$ 110° - 3x = 20° - 3y

$\Rightarrow$ 90° = 3x - 3y

$\Rightarrow$ 3(x - y) = 90° $\Rightarrow$ x - y = 30°

Sol.37.(b) acosθ $- bsin\theta$ = c ------- (1)

let, asinθ + $bcos\theta$ = x --------- (2)

Squaring both equations and then add

$a^2cos^2\theta + b^2sin^2\theta + a^2sin^2\theta + b^2cos^2\theta = c^2 + x^2$

$\Rightarrow a^2(cos^2\theta + sin^2\theta) + b^2(sin^2\theta + cos^2\theta) = c^2 + x^2$

$\Rightarrow a^2 + b^2 = c^2 + x^2 \Rightarrow a^2 + b^2 - c^2 = x^2$

$\Rightarrow x = \pm\sqrt{a^2 + b^2 - c^2}$

Sol.38.(c) $\frac{1+sec\theta+tan\theta}{1+sec\theta-tan\theta}$

$= \frac{sec^2\theta - tan^2\theta + sec\theta + tan\theta}{1+sec\theta-tan\theta}$

$= \frac{(sec\theta+tan\theta)(1+sec\theta-tan\theta)}{(1+sec\theta-tan\theta)}$

$= sec\theta + tan\theta = \frac{1+sin\theta}{cos\theta}$

$= \frac{1 + \frac{2tan\frac{\theta}{2}}{1+tan^2\frac{\theta}{2}}}{\frac{1-tan^2\frac{\theta}{2}}{1+tan^2\frac{\theta}{2}}}$

$= \frac{1 + tan^2\frac{\theta}{2} + 2tan\frac{\theta}{2}}{1 - tan^2\frac{\theta}{2}}$

$= \frac{1+tan\frac{\theta}{2}}{1-tan\frac{\theta}{2}}$

Sol.39.(d) 4cos($\frac{\pi}{6}$ - α) sin($\frac{\pi}{3}$ - α)

$= 4[(cos\frac{\pi}{6}cos\alpha + sin\frac{\pi}{6}sin\alpha) \times (sin\frac{\pi}{3}cos\alpha - cos\frac{\pi}{3}sin\alpha)]$

$= 4[(\frac{\sqrt{3}}{2}cos\alpha + \frac{1}{2}sin\alpha)(\frac{\sqrt{3}}{2}cos\alpha - \frac{1}{2}sin\alpha)]$

$= 4[\frac{3}{4}cos^2\alpha - \frac{1}{4}sin^2\alpha]$

$= 3cos^2\alpha - sin^2\alpha$ = 3 - 4sin²α

Sol.40.(d) We have given

tanθ = $x - \frac{1}{4x}$ So, tanθ = $\frac{4x^2-1}{4x}$,

We know that , sec²θ = 1 + tan²θ

So : sec²θ = 1 + $(\frac{4x^2-1}{4x})^2$

sec²θ = $(\frac{16x^2+16x^4-8x^2+1}{16x^2})$

We can write it in simplified form as:

sec²θ = $(\frac{4x^2+1}{4x})^2$ $\Rightarrow$ secθ = ±$(\frac{4x^2+1}{4x})$

So, now putting values in secθ - tanθ, we get:

If secθ is positive, then :

secθ - tanθ = $(\frac{4x^2+1}{4x}) - (\frac{4x^2-1}{4x})$

secθ – tanθ =$(\frac{4x^2+1-4x^2+1}{4x})$

secθ - tanθ = $(\frac{2}{4x})$ $\Rightarrow$ secθ - tanθ = $(\frac{1}{2x})$

If secθ is negative, then :

secθ - tanθ = - $(\frac{4x^2+1}{4x})$ - $(\frac{4x^2-1}{4x})$

secθ - tanθ = $(\frac{-4x^2-1-4x^2+1}{4x})$

secθ - tanθ = – $\frac{8x^2}{4x}$ $\Rightarrow$ secθ - tanθ = - $2x$

Sol.41.(a) 1 + tan15° cot75°

= 1 + $tan^2 15° = sec^2 15°$

Sol.42.(a) $9(x^2 - \frac{1}{x^2}) = 9x^2 - \frac{9}{x^2}$

$= (3x)^2 - (\frac{3}{x})^2 \Rightarrow cosec^2\theta - cot^2\theta \Rightarrow 1$

Sol.43.(b) $cot^{-1}(\frac{-1}{\sqrt{3}})$ = tan($\frac{-1}{\sqrt{3}}$)

= tan150° = $\frac{5\pi}{6}$

Sol.44.(c) 4sin²θ + 5cos² θ

$= 4sin^2\theta + 4cos^2\theta + cos^2\theta$

$= 4(sin^2\theta + cos^2\theta) + cos^2\theta$

$= 4 \times 1 + cos^2\theta$

= 4 + 0(minimum value of $cos\theta = 0$) = 4

Sol.45.(c) 54° = $\frac{54}{180}\pi = \frac{3\pi}{10}$

Sol.46.(c) $\sqrt{2 + \sqrt{2 + 2cos4\theta}}$

$= \sqrt{2 + \sqrt{2(1 + cos4\theta)}}$

$= \sqrt{2 + \sqrt{4cos^2 2\theta}} \Rightarrow \sqrt{2 + 2cos2\theta}$

$\Rightarrow \sqrt{2(1 + cos2\theta)} \Rightarrow \sqrt{4cos^2\theta}$ = 2cosθ

Sol.47.(c) sin($cos^{-1}\frac{3}{5}$) + cos($tan^{-1}\frac{5}{12}$)

Let $cos^{-1}\frac{3}{5} = \theta_1$ and $tan^{-1}\frac{5}{12} = \theta_2$

$\Rightarrow cos\theta_1 = \frac{3}{5}$ and $tan\theta_2 = \frac{5}{12}$

Now, sin($cos^{-1}\frac{3}{5}$) + cos($tan^{-1}\frac{5}{12}$)

$= sin\theta_1 + cos\theta_2$

$= \frac{4}{5} + \frac{12}{13} = \frac{52+60}{65} = \frac{112}{65}$

Sol.48.(d) cos(α + β) = cos90°

(α + β) = 90°, α = 90° - β

Then, sin(α − β) = sin(90° - β - β)
= sin(90° - 2β) = cos2β

Sol.49.(a) Given , sinAcosB = $\frac{1}{4}$ −− (i)

and 3tanA = tanB
⇒ 3sinAcosB =sinBcosA
Now, on putting value of sinAcosB in this we get ,

3 ($\frac{1}{4}$) = sin B × cosA

sinB × cosA = $\frac{3}{4}$ ----(ii)

Addition of equation (i) & (ii)

sinA × cosB + sinB × cosA = $\frac{1}{4}$ + $\frac{3}{4}$

Sin(A + B) = 1 = sin90°
A + B = 90° ⇒ B = 90° - A
Now, 3tanA = tanB ⇒ 3tanA = tan(90° - A)
⇒ 3tanA = cotA ⇒ $cot^2 A$ = 3

Sol.50.(c) If A + B + C = 180°, then
tanA + tanB + tanC = tanAtanBtanC

Sol.51.(b) sinθ lies between 0 to 1. Hence, the domain is R.

Sol.52.(c) The period of the cos x = 2π
The period of a periodic function is the interval of x-values on which the cycle of the graph that is repeated in both direction lies. Therefore, in the case of basic cosine function, f(x) = cosx , the period is 2π.

Sol.53.(a) cosecθ - cotθ = a

∴ cosecθ + cotθ = $\frac{1}{a}$

Adding both the equations, we get

2cosecθ = a + $\frac{1}{a}$, Cosecθ = $\frac{1}{2}(a + \frac{1}{a})$

Sol.54.(b) Given, cos28° + sin28° = k
Now, Cos17° = cos(45° - 28°)
Cos17° = cos45°cos 28° + sin45°sin 28°

⇒ Cos17° = $\frac{1}{\sqrt{2}}$cos28° + $\frac{1}{\sqrt{2}}$sin28°

⇒ Cos17° = $\frac{1}{\sqrt{2}}$(cos28° + sin28°)

⇒ Cos17° = $\frac{k}{\sqrt{2}}$

Sol.55.(c) (1 + tanα)(1 + tan4α) = 2
⇒ 1 + tanα × tan4α + tanα + tan4α = 2
⇒ tanα + tan4α = 1 - tanα tan4α

$\frac{tan\alpha + tan\,4\alpha}{1 - tan\alpha tan4\alpha}$ = 1 , [by comparing]

tan(a + b) = $\frac{tana + tan\,b}{1 - tana\,tanb}$ ⇒ tan5α = 1

⇒ 5α = $\frac{\pi}{4}$ ⇒ α = $\frac{\pi}{20}$

Sol.56.(a) Domain of cosecx
= R - {nπl n∈Z}

Sol.57.(b)

$\frac{sin(A-C) + sin(A+C) - 2sinB}{cotA + cotB + cotC}$ ----- (i)

∠B = 90°, ∠A = ∠C = 45°
Putting the value of ∠B = 90 and ∠A = ∠C = 45° in equation (i)

$\frac{sin0 + sin90 - 2sin90}{cot45 + cot90 + cot45}$

= $\frac{0 + 1 - 2 \times 1}{1 + 0 + 1}$ = − $\frac{1}{2}$

Sol.58.(b) Put x = 30°

cos^2 x + sin x = $\frac{5}{4}$

⇒ $cos^2\,30° + sin\,30° = \frac{5}{4}$

⇒ $(\frac{\sqrt{3}}{2})^2 + \frac{1}{2} = \frac{5}{4}$

⇒ $\frac{3}{4} + \frac{1}{2} = \frac{5}{4}$ ⇒ $\frac{5}{4} = \frac{5}{4}$

L.H.S = R.H.S
So, x = 30° satisfied.

Hence, sin x = sin 30° = $\frac{1}{2}$

Sol.59.(a) Formula :-
$sin(A + B)$ = sinA cosB + cosA sinB
Sin($2A$) = 2 sinA cosA
Now,

$\frac{sin\,3A}{sinA} + \frac{cos3A}{cosA}$

= $\frac{cosA\,sin3A + sinA\,cos3A}{sinA\,cosA}$ = $\frac{sin\,4A}{sinA\,cosA}$

$\frac{2 \times sin\,4A}{2 \times (sinA\,cosA)}$ = $\frac{4\,sin2A\,cos\,2A}{sin2A}$

= 4cos 2A

Sol.60.(a) We know that, 60" = 1'

⇒ $30" = \frac{30}{60} = 0.5"$

Now, we have 5° 37' 30" = 5° 37.5'
We know that, 60" = 1°

⇒ $37.5' = \frac{37.5}{60}$ = 0.625

Now, we have 5° 37.55' = 5.625°

We know that 180° = π^c ⇒ $5.625° = \frac{\pi}{32}$

Sol.61.(b)
We know that cos (180° - A) = - cosA
Since ABCD is a Cyclic Quadrilateral.
Then , A + C = 180° ⇒ C =180° - A
B + D = 180° ⇒ D =180° - B
= cos^2A − cos^2B −cos^2(180° - A) + cos^2 (180° - B)
= cos^2A − cos^2B −cos^2A + cos^2B = 0

Sol.62.(d) Check by options, $\frac{1}{\sqrt{1 + cot^2\theta}}$

= $\frac{1}{\sqrt{cosec^2\theta}} = \frac{1}{cosec\theta} = sin\theta$

Sol.63.(b) (Sin^2 22° + Sin^2 68°)
= $Sin^2 22° + sin^2(90 - 22)°$
= $sin^2 22° + cos^2 22°$ = 1
and , ($Cos^2$33° + Cos^2 57°)
= $cos^2 33° + cos^2(90 - 33)°$
= $cos^2 33° + sin^2 33°$ = 1
Therefore
(Sin^2 22° + Sin^2 68°) : ($Cos^2$33° + Cos^2 57°)
= 1 : 1

Sol.64.(c) (cosec θ - cot θ)² = $\frac{1 - cos\,\theta}{A}$

($\frac{1}{sin\theta}$ - $\frac{cos\theta}{sin\theta}$)² = ($\frac{1 - cos\,\theta}{sin\theta}$)²

= $\frac{(1 - cos\,\theta)(1 - cos\,\theta)}{sin^2\theta}$

= $\frac{(1 - cos\,\theta)(1 - cos\,\theta)}{(1 - cos^2\theta)}$

⇒ $\frac{(1 - cos\theta)(1 - cos\,\theta)}{(1 - cos\theta)(1 + cos\theta)}$ = $\frac{1 - cos\,\theta}{A}$

⇒ $\frac{1}{(1 + cos\theta)} = \frac{1}{A}$ ⇒ A = $(1 + cos\theta)$

Sol.65.(d)

$\sqrt{\frac{1 - cos\theta}{1 + cos\theta}} = \sqrt{\frac{1 - cos\theta \times (1 - cos\theta)}{1 + cos\theta \times (1 - cos\theta)}}$

= $\sqrt{\frac{(1 - cos\theta)^2}{1 - cos^2\theta}} = \frac{1 - cos\theta}{sin\theta}$

= $\frac{1}{sin\theta} - \frac{cos\theta}{sin\theta} = cosec\theta - cot\theta$

Sol.66.(a)
2sec²A + 4cosec²A - 2tan²A - 4cot²A
We know that ,
sec²A - tan²A =1 and cosec²A - cot ²A =1
⇒ 2(sec²A - tan²A) + 4(cosec²A - cot ²A)
⇒ 2 + 4 =6

Sol.67.(d) $\frac{sinA}{1 + cosA} + \frac{1 + cosA}{sinA}$

= $\frac{sin^2 A + (1 + cosA)^2}{(1 + cosA)sinA}$

= $\frac{sin^2 A + 1 + 2cosA + cos^2 A}{(1 + cosA)sinA}$

= $\frac{sin^2 A + cos^2 A + 1 + 2cosA}{(1 + cosA)sinA} = \frac{2 + 2cosA}{(1 + cosA)sinA}$

= $\frac{2(1 + cosA)}{(1 + cosA)sinA} = \frac{2}{sinA} = 2cosecA$

Sol.68.(b) Since, sin0° = 0
$sin90° \,.\, sin89° \,.\, sin88° \,.\, sin87°$.....
..... $sin0° = 0$

Sol.69.(b)

$Put\ A = 30°$ then $\frac{cosA - sinA + 1}{cosA + sinA - 1}$

= $\frac{\frac{\sqrt{3}}{2} - \frac{1}{2} + 1}{\frac{\sqrt{3}}{2} + \frac{1}{2} - 1} = \frac{\sqrt{3} + 1}{\sqrt{3} - 1} \times \frac{\sqrt{3} + 1}{\sqrt{3} + 1}$

= 2 + $\sqrt{3}$

By options, cotA + cosecA = $\sqrt{3}$ + 2

Sol.70.(c) tan²A + secA = 11
We know that tan²A = sec²A - 1
So, sec²A - 1 + secA = 11

⇒ sec²A + secA - 12 = 0
⇒ sec²A + 4secA -3secA - 12 = 0
⇒ secA(secA + 4) -3(secA + 4) = 0
⇒ (secA - 3)(secA + 4) = 0
Sec A ≠ - 4 (because A = acute angle , it can not be negative)
So secA = 3 ⇒ $\frac{3}{1} = \frac{H}{B}$
H = 3 , B = 1
By pythagoras theorem
P = $\sqrt{3^2 - 1}$ = $2\sqrt{2}$
Therefore, cot A = $\frac{B}{p} \Rightarrow \frac{1}{2\sqrt{2}}$

Sol.71.(d) $\frac{sin^2A}{1-cosA} = \frac{1-cos^2A}{1-cosA}$
$= \frac{(1-cosA)(1+cosA)}{1-cosA} = 1 + cosA$

Sol.72.(d) Secθ = $\frac{5}{3} \Rightarrow \frac{H}{B}$
By pythagoras theorem
P = $\sqrt{5^2 - 3^2} \Rightarrow 4$
Now, $\frac{3\times\frac{4}{3} - 5\times\frac{3}{5}}{5\times\frac{4}{5} - 3\times\frac{5}{3}} = \frac{1}{-1} \Rightarrow -1$

Sol.73.(a) Put β = 45°
(sinβ + cosecβ)² + (secβ - cosβ)² = a + tan²β + cot²β
5 = a + 1 + 1 ⇒ $a = 5 - 2 = 3$

Sol.74.(b) $\frac{20 + 20tan^2A}{50 + 50cot^2A} = \frac{20(1+tan^2A)}{50(1+cot^2A)}$
$= \frac{2sec^2A}{5cosec^2A} = \frac{2}{5}\ tan^2A$

Sol.75.(c)
Put θ = 45°, and satisfy from the options.
$\sqrt{\frac{sec^2\theta + cosec^2\theta}{tan^2\theta - sin^2\theta}} \times \frac{(1+tan^2\theta)\,sin^2\theta}{(cosec\theta - cot\theta)(1+cos\theta)}$
$= \sqrt{\frac{(\sqrt{2})^2 + (\sqrt{2})^2}{1 - \frac{1}{(\sqrt{2})^2}}} \times \frac{(1+1)\frac{1}{(\sqrt{2})^2}}{(\sqrt{2}-1)\left(1+\frac{1}{\sqrt{2}}\right)}$
$= 2\sqrt{2} \times \sqrt{2} = 4$ and,
$cosec^2\theta \times sec^2\theta = (\sqrt{2})^2 \times (\sqrt{2})^2 = 4$

Sol.76.(b)
$\frac{(1+cot\theta - cosec\theta)(1+tan\theta+sec\theta)(sec^2\theta)}{(sec\theta - cos\theta)(cot\theta + tan\theta)}$
$\Rightarrow \frac{(1+\frac{cos\theta}{sin\theta} - \frac{1}{sin\theta})(1+\frac{sin\theta}{cos\theta} + \frac{1}{cos\theta})}{(\frac{1}{cos\theta} - cos\theta)(\frac{cos\theta}{sin\theta} + \frac{sin\theta}{cos\theta})(cos^2\theta)}$
$\Rightarrow \frac{(\frac{sin\theta + cos\theta - 1}{sin\theta})(\frac{sin\theta + cos\theta + 1}{cos\theta})}{(\frac{1-cos^2\theta}{cos\theta})(\frac{sin^2\theta + cos^2\theta}{sin\theta . cos\theta})(cos^2\theta)}$
$\Rightarrow \frac{(\frac{(sin\theta + cos\theta)^2 - 1}{sin\theta . cos\theta})}{(\frac{sin^2\theta}{cos\theta})(\frac{1}{sin\theta . cos\theta})(cos^2\theta)}$
$\Rightarrow \frac{2}{sin\theta} = 2\ cosec\theta$

Sol.77.(b)
$\frac{(cosec\theta - sin\theta)(sec\theta - cos\theta)(tan\theta + cot\theta)}{cos\theta(sec\theta - tan\theta)^2(sec\theta + tan\theta)}$
$= \frac{1}{1-k}$
$\frac{(\frac{1}{sin\theta} - sin\theta)(\frac{1}{cos\theta} - cos\theta)(\frac{sin\theta}{cos\theta} + \frac{cos\theta}{sin\theta})}{cos\theta(sec\theta - tan\theta)(sec\theta - tan\theta)(sec\theta + tan\theta)}$
$= \frac{1}{1-k}$
$\Rightarrow \frac{(\frac{1-sin^2\theta}{sin\theta})(\frac{1-cos^2\theta}{cos\theta})(\frac{1}{cos\theta \times sin\theta})}{cos\theta(sec\theta - tan\theta)(sec^2\theta - tan^2\theta)}$
$= \frac{1}{1-k}\ (sec^2\theta - tan^2\theta = 1)$
$\Rightarrow \frac{1}{cos\theta\frac{(1-sin\theta)}{cos\theta}} = \frac{1}{1-k} \Rightarrow \frac{1}{(1-sin\theta)}$
$= \frac{1}{1-k}$
Therefore k = sinθ

Sol.78.(b)
(sinA + cosecA)² + (cosA + secA)²
⇒ sin²A + cosec²A + 2 + cos²A + sec²A +2
⇒ 5 + cosec²A + sec²A[sin²A + cos²A= 1]

Sol.79.(d) (1 + tan 20° + sec 20°)(1 + cot 20° - cosec 20°)
⇒ $(1 + \frac{sin20°}{cos20°} + \frac{1}{cos20°})(1 + \frac{cos20°}{sin20°} - \frac{1}{sin20°})$
⇒ $(\frac{cos20° + sin20° + 1}{cos20°})$
$(\frac{sin20° + cos20° - 1}{sin20°})$
⇒ $(\frac{(cos20° + sin20°)^2 - 1}{cos20° \times sin20°})$
⇒ $\frac{cos^220° + sin^220° + 2\times cos\ 20°\times sin\ 20° - 1}{cos20°\times sin20°}$
⇒ $(\frac{1 + 2\times cos\ 20°\times sin\ 20° - 1}{cos20°\times sin20°})$
⇒ $\frac{2\times cos\ 20°\times sin\ 20°}{cos20°\times sin20°} = 2$

Sol.80.(a) $\frac{cos40°}{1+sin\ 40°} + \frac{1+sin\ 40°}{cos40°}$
⇒ $\frac{cos^240° + (1+sin\ 40°)^2}{(1+sin\ 40°)cos40°}$
⇒ $\frac{cos^240° + 1 + sin^240° + 2sin40°}{(1+sin\ 40°)cos40°}$
⇒ $\frac{2 + 2sin40°}{(1+sin\ 40°)cos40°}$
⇒ $\frac{2(1+sin40°)}{(1+sin\ 40°)cos40°} = 2sec40°$

Sol.81.(a)
(cosec x + cot x + 1)(sec x - tan x -1)
By putting value of x = 45°
(cosec45°+cot45°+1)(sec45° - tan45° - 1)
⇒ $(\sqrt{2} + 1 + 1)(\sqrt{2} - 1 - 1) \Rightarrow ((\sqrt{2})^2 - 2^2)$
⇒ 2 - 4 = -2

Sol.82.(b)
$\frac{tan^2\ 60° + cot^2 30°}{tan^220° - sec^2\ 20°} - \frac{sin\ 90° + cos\ 0°}{cosec^220° - cot^2\ 20°}$
$= \frac{tan^2\ 60° + cot^2(90-60)°}{tan^220° - sec^2\ 20°} - \frac{1+1}{1}$
$= \frac{tan^2\ 60° + tan^2\ 60°}{-1} - 2$
$= -2tan^2\ 60° - 2 = -6 - 2 = -8$

Sol.83.(a)
sin²θ + cos²θ − (sec²θ− tan²θ) + tanθ cos θ − sinθ = 1 - 1 + sinθ $- sin\theta = 0$

Sol.84.(b)
sec² θ +(cosec² θ - 1) - (1+ $tan^2\theta$) - cot² θ
$= sec^2\ \theta + cot^2\ \theta - sec^2\ \theta - cot^2\ \theta = 0$

Sol.85.(b)
sin x + $\frac{Cosx}{tan\ (90-x)} = sinx + \frac{cosx}{cotx}$
$= sinx + sinx = 2sinx$

Sol.86.(c)
$\frac{sin(90°-\theta)\ cos(90°-\theta)\ cot\ (90°-\theta)}{cos^2\theta - 1}$
$= \frac{cos\theta.sin\theta.tan\theta}{-sin^2\theta} = \frac{sin^2\theta}{-sin^2\theta} = -1$

Sol.87.(b) $(cot\ A + cos\ A)^2 = m^2$
$(cot\ A - cos\ A)^2 = n^2$
According to question :-
$\Rightarrow m^2 - n^2 =$
$(cot\ A + cos\ A)^2 - (cot\ A - cos\ A)^2$
$\Rightarrow m^2 - n^2 = 4$ cotA cosA
Squaring both sides ⇒
$(m^2 - n^2)^2 = 16cot^2Acos^2A$
$\Rightarrow (m^2 - n^2)^2 = 16\ cot^2Acos^2A$
[Since,
$(cot\ A + cos\ A)(cot\ A - cos\ A) = mn$]
$\Rightarrow cot^2A - cos^2A = mn$
$\Rightarrow \frac{cos^2A}{sin^2A} - cos^2A = mn$
$\Rightarrow \frac{cos^2A(1-sin^2A)}{sin^2A} = mn$
$\frac{cos^2A(cos^2A)}{sin^2A} = mn \Rightarrow cot^2Acos^2A = mn$
So , $(m^2 - n^2)^2 = 16\ cot^2Acos^2A$
$= 16mn$

Sol.88.(a) $If\ x = a\ sec^n\theta,\ y = b\ tan^n\theta$,
By hit and trial method we get , option (a)
$\left(\frac{x}{a}\right)^{\frac{2}{n}} - \left(\frac{y}{b}\right)^{\frac{2}{n}} = 1$
$\Rightarrow \left(\frac{a\ sec^n\theta}{a}\right)^{\frac{2}{n}} - \left(\frac{b\ tan^n\theta}{b}\right)^{\frac{2}{n}} = 1$
$\Rightarrow sec^2\theta - tan^2\theta = 1$

Sol.89.(c)
$(sin\ x + sec\ x)^2 + (cosec\ x + cos\ x)^2$

$= sin^2x + sec^2x + 2sinx.secx + cosec^2x + cos^2x + 2cosecx.cosx$

$= (sin^2x + cos^2x) + (cosec^2x + sec^2x) + 2(tanx + cotx)$

$= (sin^2x + cos^2x) + (cosec^2x + sec^2x) + 2(\frac{Sinx}{Cosx} + \frac{Cosx}{Sinx})$

$= 1 + cosec^2x + sec^2x + 2secx.cosecx$

$= 1 + \frac{1}{sin^2x} + \frac{1}{cos^2x} + 2secx.cosecx$

$= 1 + \frac{1}{sin^2x.cos^2x} + 2secx.cosecx$

$= 1 + cosec^2x.sec^2x + 2secx.cosecx$

$= (cosecx.secx + 1)^2$

Sol.90.(a) $tan^6A + 3\,tan^2A\,sec^2A + 1$

$= tan^6A + 3\,tan^2A\,(1 + tan^2A) + 1$

$= tan^6A + 3\,tan^2A + 3tan^4A + 1$

$= (tan^2A + 1)^3 = sec^6A$

Sol.91.(c)

$\left(\frac{1}{sec^2\theta - cos^2\theta} + \frac{1}{cosec^2\theta - sin^2\theta}\right) \times (sin^2\theta . cos^2\theta)$

$= (\frac{cos^2\theta}{1 - cos^4\theta} + \frac{sin^2\theta}{1 - sin^4\theta}) \times (sin^2\theta . cos^2\theta)$

$= \left(\frac{cos^2\theta}{(1 + cos^2\theta).sin^2\theta} + \frac{sin^2\theta}{(1 + sin^2\theta).cos^2\theta}\right) \times (sin^2\theta . cos^2\theta)$

$= \left(\frac{cos^2\theta(1 + sin^2\theta).cos^2\theta + sin^2\theta(1 + cos^2\theta).sin^2\theta}{(1 + cos^2\theta).sin^2\theta\,(1 + sin^2\theta).cos^2\theta}\right) \times (sin^2\theta . cos^2\theta)$

$= (\frac{cos^4\theta + cos^4\theta sin^2\theta + sin^4\theta + cos^2\theta sin^4\theta}{(1 + cos^2\theta)(1 + sin^2\theta)})$

$= (\frac{cos^4\theta + sin^4\theta + cos^2\theta sin^2\theta(sin^2\theta + cos^2\theta}{(1 + cos^2\theta + cos^2\theta sin^2\theta + sin^2\theta)})$

$= \frac{(cos^2\theta + sin^2\theta)^2 - cos^2\theta sin^2\theta}{2 + cos^2\theta sin^2\theta}$

$= \frac{1 - cos^2\theta\ sin^2\theta}{2 + cos^2\theta\ sin^2\theta}$

Sol.92.(d)

$(1 + cot^2\theta)(1 + \cos\theta)(1 - \cos\theta) + (1 - \sin\theta)(1 + \sin\theta)(1 + tan^2\theta)$

$= cosec^2\theta \times (1 - cos^2\theta) + (1 - sin^2\theta) \times sec^2\theta$

$= cosec^2\theta - cot^2\theta + sec^2\theta - tan^2\theta$

$= 1 + 1 = 2$

Sol.93.(d) $sin^6\theta + cos^6\theta$

$= (sin^2\theta)^3 + (cos^2\theta)^3$

$= (sin^2\theta + cos^2\theta)(sin^4\theta + cos^4\theta - sin^2\theta \times cos^2\theta)$

$= (sin^2\theta + cos^2\theta)^2 - 3\,sin^2\theta\,cos^2\theta$

$= 1 - 3\,sin^2\theta.\,cos^2\theta$

Sol.94.(b) $\tan^2\alpha - \sec\alpha = 19$

$\frac{sin^2\alpha}{cos^2\alpha} - \frac{1}{cos\alpha} = 19 \Rightarrow \frac{sin^2\alpha - cos\alpha}{cos^2\alpha} = 19$

$\Rightarrow \frac{1 - cos^2\alpha - cos\alpha}{cos^2\alpha} = 19$

$\Rightarrow \frac{1 - cos^2\alpha - cos\alpha}{cos^2\alpha} = 19$

$\Rightarrow 20cos^2\alpha + cos\alpha - 1 = 0$

$\Rightarrow 20cos^2\alpha + 5\,cos\alpha - 4\,cos\alpha - 1 = 0$

$\Rightarrow 5cos\alpha\,(4cos\alpha + 1) - 1\,(4\,cos\alpha + 1) = 0$

$\Rightarrow (4cos\alpha + 1)(5cos\alpha - 1) = 0$

so , $\cos\alpha = \frac{-1}{4}, \frac{1}{5}$

Since, value of α is an acute angle . hence, $\cos\alpha = \frac{1}{5}$

Sol.95.(c) $\sqrt{\frac{4 - 5cos^2\theta}{sin^2\theta} + cot^2\theta}$

$\Rightarrow \sqrt{\frac{4 - 5cos^2\theta}{sin^2\theta} + \frac{cos^2\theta}{sin^2\theta}}$

$\Rightarrow \sqrt{\frac{4 - 5cos^2\theta + cos^2\theta}{sin^2\theta}}$

$\Rightarrow \sqrt{\frac{4(1 - cos^2\theta)}{sin^2\theta}} = \sqrt{\frac{4sin^2\theta}{sin^2\theta}} = 2$

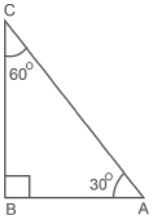
Sol.96.(c) $3\sin^2\theta + 7\cos^2\theta = 6$

$3\sin^2\theta + 7(1 - \sin^2\theta) = 6$

$3\sin^2\theta + 7 - 7\sin^2\theta = 6 \Rightarrow 4\sin^2\theta = 1$

$\Rightarrow \sin\theta = \frac{1}{2} = \theta = 30°$

Sol.97.(a)



$\tan A = \frac{1}{\sqrt{3}}$

A = 30°, C = 180° - 90° - 30° = 60°

(sin A cos C + cos A sin C)

= sin30° × cos60° + cos30° × sin60°

$= \frac{1}{2} \times \frac{1}{2} + \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2}$

$= \frac{1}{4} + \frac{3}{4} = 1$

Sol.98.(d) $\frac{3 - 4sin^2\theta}{cos^2\theta} = 3\sec^2\theta - 4\tan^2\theta$

$= 3\sec^2\theta - 3\tan^2\theta - \tan^2\theta$

$= 3(\sec^2\theta - \tan^2\theta) - \tan^2\theta = 3 - \tan^2\theta$

Sol.99.(a) $cot\theta(\frac{cosec\,\theta + 1 + cosec\,\theta - 1}{cosec^2\,\theta - 1}) \times \left(sin\,\theta - \frac{1}{sin\theta}\right)(cos\,\theta - \frac{1}{cos\,\theta})$

$= cot\theta(\frac{2\,cosec\,\theta}{cot^2\theta}) \times (\frac{sin^2\,\theta - 1}{sin\,\theta})$

$= (\frac{cos^2\,\theta - 1}{cos\,\theta})$

$= (\frac{2\,cosec\,\theta}{cot\theta}) \times (\frac{cos^2\,\theta}{sin\,\theta})(\frac{sin^2\theta}{cos\,\theta})$

$= (\frac{2\,cosec\,\theta}{cot\theta}) \times (cot\theta)(sin^2\theta)$

$= 2cosec\,\theta \times sin^2\theta \Rightarrow \frac{2}{sin\theta} \times sin^2\theta$

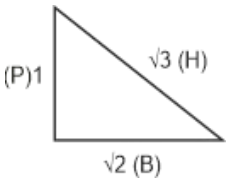
$= 2\,sin\theta$

Sol.100.(a) $\frac{1}{1 + tan\theta} + \frac{1}{1 - tan\theta} = 4$

$\frac{1 - tan\theta + 1 + tan\theta}{1 - tan^2\theta} = 4$

$2 = 4(1 - tan^2\theta) \Rightarrow 4tan^2\theta = 2$

$tan^2\theta = \frac{1}{2}$, $\tan\theta = \frac{1}{\sqrt{2}}$



$cosec^2\theta + sec^2\theta = (\left(\frac{h}{p}\right)^2 + \left(\frac{h}{b}\right)^2)$

$= (\left(\frac{\sqrt{3}}{1}\right)^2 + \left(\frac{\sqrt{3}}{\sqrt{2}}\right)^2) = 3 + \frac{3}{2} = \frac{9}{2}$

Sol.101.(c) $2\sin y + \cos y = \sqrt{5}\sin y$

Dividing both sides by (cos y), we get

$2\tan y + 1 = \sqrt{5}\tan y$

$\sqrt{5}\tan y - 2\tan y = 1$

$(\sqrt{5} - 2)\tan y = 1$

$\tan y = \frac{1}{\sqrt{5} - 2} = \frac{1}{\sqrt{5} - 2} \times \frac{\sqrt{5} + 2}{\sqrt{5} + 2}$

$\tan y = \sqrt{5} + 2$

Sol.102.(a)

$\frac{cos^2(45° + \theta) + cos^2(45° - \theta)}{4 \times \frac{1}{2} - 4}$

$\frac{1}{4 \times \frac{1}{2} - 4} = \frac{-1}{2}$

Sol.103.(d) $\mathrm{Cot}^2\theta = 1 + \cos^2\theta - \sin^2\theta$

Put $\theta = 45°$

$\mathrm{Cot}^2 45° = 1 + \cos^2 45° - \sin^2 45°$

$1 = 1 + 0 \Rightarrow 1 = 1$ (Satisfy)

$\tan^2\theta + \mathrm{cosec}^2\theta = \tan^2 45° + \mathrm{cosec}^2 45°$

$= 1 + (\sqrt{2})^2 = 3$

Sol.104.(b) $\sin\theta + (\frac{1}{4})\mathrm{cosec}\theta = 1$

$\sin\theta + \frac{1}{4sin\theta} = 1$

$4\sin^2\theta + 1 = 4\sin\theta$

$4\sin^2\theta - 4\sin\theta + 1 = 0$

$4\sin^2\theta - 2\sin\theta - 2\sin\theta + 1 = 0$

$2\sin\theta(2\sin\theta - 1) - 1(2\sin\theta - 1) = 0$

$\sin\theta = \frac{1}{2}$, So, $\theta = 30°$

Sol.105.(a) $3\cos^2\theta + 1 = 4\sin\theta$

$3(1 - \sin^2\theta) + 1 = 4\sin\theta$
$3 - 3\sin^2\theta + 1 = 4\sin\theta$
$3\sin^2\theta + 4\sin\theta - 4 = 0$
$3\sin^2\theta + 6\sin\theta - 2\sin\theta - 4 = 0$
$3\sin\theta(\sin\theta + 2) - 2(\sin\theta + 2) = 0$
$(3\sin\theta - 2) = 0$
$\Rightarrow \sin\theta = \frac{2}{3} = \frac{P}{H}$
$B = \sqrt{3^2 - 2^2} = \sqrt{5}$
$\text{Sec}^2\theta = (\frac{H}{B})^2 = (\frac{3}{\sqrt{5}})^2 = \frac{9}{5}$

Sol.106.(d) $\sin^2\beta - \sin 30° = 0$
By options, when
$\beta = 45°; \sin^2 45° - \sin 30°$
$= \frac{1}{2} - \frac{1}{2} = 0$

Sol.107.(c) $\tan\theta + 3\cot\theta = 2\sqrt{3}$
$\frac{1}{\cot\theta} + 3\cot\theta = 2\sqrt{3}$
$1 + 3\cot^2\theta = 2\sqrt{3}\cot\theta$
$3\cot^2\theta - 2\sqrt{3}\cot\theta + 1 = 0$
Then, $\cot\theta = \frac{1}{\sqrt{3}}$
$\text{cosec}^2\theta = 1 + \cot^2\theta = 1 + (\frac{1}{\sqrt{3}})^2$
$= 1 + \frac{1}{3} = \frac{4}{3}$

Sol.108.(d) $\sin\theta = \frac{3}{4}$ and $\cos\theta = \frac{5}{4}$,
i.e. $\tan\theta = \frac{3}{5}$ and $\cot\theta = \frac{5}{3}$
Then the value of $\frac{1 + \tan\theta}{1 - \cot\theta}$ is ,
$= \frac{1 + \frac{3}{5}}{1 - \frac{5}{3}} = -\frac{12}{5}$

Sol.109.(a) $\frac{1}{\sin^2 65° + \cos^2 65°} + \frac{\sin 15°}{\cos 75°} + \frac{\cos 65°}{\sin 25°} = \sqrt{3}\tan\theta$
$\Rightarrow \frac{1}{1} + \frac{\cos 75°}{\cos 75°} + \frac{\cos 65°}{\cos 65°} = \sqrt{3}\tan\theta$
$\Rightarrow \sqrt{3}\tan\theta = 3 \Rightarrow \tan\theta = \sqrt{3}$
Then the value of θ is $60°$.

Sol.110.(c) As $\cos 2\theta = \sin\theta$ and θ lies between $0°$ and $90°$.
$\Rightarrow \cos 2\theta = \cos(90° - \theta)$,
$\Rightarrow 3\theta = 90° \Rightarrow \theta = 30°$
Then θ will be 30^o .

Sol.111.(d)
$\frac{\sin 27°\cos 63°}{\cos^2 27°} - \frac{\sec 27°\text{cosec}\,63°}{\tan^2 45°}$
$= \frac{\sin 27°\sin 27°}{\cos^2 27°} - \frac{\sec 27°\sec 27°}{\tan^2 45°}$
$= \frac{\sin^2 27°}{\cos^2 27°} - \frac{\sec^2 27°}{\tan^2 45°}$
$= \tan^2 27° - \sec^2 27°$
$= -(\sec^2 27° - \tan^2 27°) = -1$

Sol.112.(b)
$\cos 12° + \cos 84° + \cos 168° + \cos 96°$
$= (\cos 12° + \cos 168°) + (\cos 84° + \cos 96°)$
Formula →
$[\cos A + \cos B = 2\cos\frac{A+B}{2}\cos\frac{A-B}{2}]$
$= 2\cos 90°\cos 78° + 2\cos 90°\cos 6°$
$= 0 + 0 = 0$

Sol.113.(a) Given, $\tan\theta + \cot\theta = 5$
On squaring both sides,
$\tan^2\theta + \cot^2\theta + 2 = 25$
$\Rightarrow \tan^2\theta + \cot^2\theta = 25 - 2$
$\Rightarrow \tan^2\theta + \cot^2\theta = 23$
We have to find,
$\tan^2\theta + \cot^2\theta + 2\tan^2 60°$
$= 23 + 2 \times (\sqrt{3})^2 = 23 + 6 = 29$

Sol.114.(a) $\tan 15° = \tan(45° - 30°)$
$= \frac{\tan 45° - \tan 30°}{1 + \tan 45° \times \tan 30°}$
$= \frac{1 - \frac{1}{\sqrt{3}}}{1 + 1 \times \frac{1}{\sqrt{3}}} = \frac{\sqrt{3} - 1}{\sqrt{3} + 1}$
$\cot 15° = \frac{\sqrt{3} + 1}{\sqrt{3} - 1}$,
$\tan 15° + \cot 15° = \frac{\sqrt{3} - 1}{\sqrt{3} + 1} + \frac{\sqrt{3} + 1}{\sqrt{3} - 1}$
$= \frac{2 \times (3 + 1)}{2} = 4$
Short Tricks :-
$\tan\theta + \cot\theta = \frac{1}{\sin\theta\cos\theta} = 2\text{cosec}\,2\theta$
$\tan 15° + \cot 15° = 2\text{cosec}\,30° = 2 \times 2 = 4$

Sol.115.(c) $\sin(45° + A) - \cos(45° - A)$
$= \cos\{90° - (45° + A)\} - \cos(45° - A)$
$= \cos(45° - A) - \cos(45° - A) = 0$

Sol.116.(c) Given,
$\sin 2A = 2\sin A$ ---- (i)
As we know,
$\sin 2A = 2\sin A\cos A$ ---- (ii)
From (i) and (ii), Here, $\cos A = 1 \therefore A = 0°$

Sol.117.(c) $(\sin A + \cos A)^2 - 2\sin A\cos A$
$= \sin^2 A + \cos^2 A + 2\sin A\cos A - 2\sin A\cos A$
$= \sin^2 A + \cos^2 A = 1$

Sol.118.(a) $\cos^2(270 - \Phi) - \sin^2(180 - \Phi) + \sin^2(\frac{\pi}{2})\sin^2(270 - \Phi)$
$= \sin^2\phi - \sin^2\phi + \cos^2\phi = \cos^2\phi$

Sol.119.(b) $= 6(\sec^2 59° - \cot^2 31°) + \frac{2}{3}$
$\sin 90° - 3\tan^2 56° y\tan^2 34° = \frac{y}{3}$
$\Rightarrow 6(\sec^2(90° - 31°) - \cot^2 31°) + \frac{2}{3} \times 1 - 3y\tan^2(90° - 34°)\tan^2 34° = \frac{y}{3}$
$\Rightarrow 6(\text{cosec}^2 31° - \cot^2 31°) + \frac{2}{3} - 3y\cot^2 34°\tan^2 34° = \frac{y}{3}$
$\Rightarrow 6 + \frac{2}{3} - 3y = \frac{y}{3}$
$\Rightarrow 6 + \frac{2}{3} = \frac{y}{3} + 3y$
$\Rightarrow \frac{20}{3} = \frac{10y}{3} \Rightarrow y = 2$

Sol.120.(a) $\sqrt{3}\sin\theta - \cos\theta = 0$
$\sqrt{3}\sin\theta = \cos\theta$, $\tan\theta = \frac{1}{\sqrt{3}} \Rightarrow \theta = 30°$
So the value of $\cos^3\theta - \sqrt{3}\sin^3\theta$
$= \frac{3\sqrt{3}}{8} - \frac{\sqrt{3}}{8} = \frac{\sqrt{3}}{4}$

Sol.121.(c) $\sin\theta - \cos\theta = 0$
$\Rightarrow \sin\theta = \cos\theta$ and θ is in 1st quadrant
$\therefore \theta = 45°$
Now , $\sin^3\theta + 3\cos^3\theta$
$= \sin^3 45° + 3\cos^3 45°$
$= (\frac{1}{\sqrt{2}})^3 + 3(\frac{1}{\sqrt{2}})^3$
$= \frac{1}{2\sqrt{2}} + 3 \times \frac{1}{2\sqrt{2}} = \frac{4}{2\sqrt{2}} = \sqrt{2}$

Sol.122.(a) Let $\sec\theta = x$
$16\sec^2\theta - 40\sec\theta + 25 = 0$
$\Rightarrow 16x^2 - 40x + 25 = 0$
$\Rightarrow 16x^2 - 20x - 20x + 25 = 0$
$\Rightarrow 4x(4x - 5) - 5(4x - 5) = 0$
$\Rightarrow (4x - 5)(4x - 5) = 0$
$\Rightarrow 4x - 5 = 0 \Rightarrow x = \frac{5}{4}$
$\therefore \sec\theta = \frac{5}{4} = \frac{h}{b}$, $p = 3 \Rightarrow \tan\theta = \frac{3}{4}$

Sol.123.(d) $\cos(x + y) = \frac{1}{2} = \cos 60°$
$\Rightarrow x + y = 60°$ ------ (1)
$\sin(x - y) = 0 = \sin 0°$
$\Rightarrow x - y = 0°$ ------ (2)
On solving equation (1) and (2) , We get , $x = 30°$ and $y = 30°$

Sol.124.(a) $x = a\sin\theta, \Rightarrow \frac{a^2}{x^2} = \frac{1}{\sin^2\theta}$
and $y = b\tan\theta, \Rightarrow \frac{b^2}{y^2} = \frac{\cos^2\theta}{\sin^2\theta}$
Then the value of $\frac{a^2}{x^2} - \frac{b^2}{y^2}$
$= \frac{1}{\sin^2\theta} - \frac{\cos^2\theta}{\sin^2\theta} = 1$

Sol.125.(d) $\sqrt{\frac{1 + \cos 2A}{1 - \cos 2A}}$

Short trick : put A = 30°

$\sqrt{\frac{1+cos60}{1-cos60}} = \sqrt{\frac{1+\frac{1}{2}}{1-\frac{1}{2}}} = \sqrt{3}$

= cot 30° = cotA

Sol.126.(d) Given:

rsinθ = $\frac{7}{2}$ -- (i) , rcosθ = $\frac{7\sqrt{3}}{2}$ ----(ii)

squaring equation (i) and (ii) and adding both

$\Rightarrow r^2sin^2\theta + r^2cos^2\theta = \frac{49}{4} + \frac{49\times3}{4}$

$\Rightarrow r^2(sin^2\theta + cos^2\theta) = \frac{196}{4}$

$\Rightarrow r^2 = 49 \Rightarrow r = 7$

Sol.127.(d) $cos^4\theta - sin^4\theta = \frac{2}{3}$

$\Rightarrow (cos^2\theta)^2 - (sin^2\theta)^2 = \frac{2}{3}$

$\Rightarrow (cos^2\theta + sin^2\theta)(cos^2\theta - sin^2\theta) = \frac{2}{3}$

$\Rightarrow (cos^2\theta - sin^2\theta) = \frac{2}{3}$

$\Rightarrow$ (1 - $sin^2\theta - sin^2\theta$) = $\frac{2}{3}$

$\Rightarrow$ 1 - 2$sin^2\theta$ = $\frac{2}{3}$

Sol.128.(a)

sin(3A - 20°) = cos(20° − 3B)
⇒ sin(3A - 20°) = sin(70° + 3B)
⇒ 3A - 20° = 70° + 3B°
⇒ 3(A - B) = 90° ⇒ A - B = 30°

Sol.129.(b) Given that,
[$cosec$(75° + θ) - sec(15° - θ) - tan(55° + θ) + cot(35° - θ)]
As we know :
$cosec$(75° + θ) = sec(15° - θ) and
tan(55° + θ) = cot(35° - θ) ; So ,
= sec(15° - θ) - sec(15° - θ) - cot(35° - θ) + cot(35° - θ) = 0

Sol.130.(b) $sin15°$ = sin(45° - 30°)

= $sin45°\ cos30°$ - $cos45°\ sin30°$

= $\frac{1}{\sqrt{2}}\times\frac{\sqrt{3}}{2} - \frac{1}{\sqrt{2}}\times\frac{1}{2} = \frac{\sqrt{3}-1}{2\sqrt{2}}$

Sol.131.(a) As sinθ + cosecθ = 2 ,

$\Rightarrow sin\theta + \frac{1}{sin\theta} = 2$

$\Rightarrow sin^2\theta - 2sin\theta + 1 = 0$

$\Rightarrow (sin\theta - 1)^2 = 0$

$\Rightarrow sin\theta = 1$ then $cosec\theta = 1$

So, $sin^8\theta + cosec^8\theta = (1)^8 + (1)^8 = 2$

Alternate Method:

As sinθ + cosecθ = 2 (given) ,

$\Rightarrow sin\theta + \frac{1}{sin\theta} = 2$

Let $sin\theta = x$ Now, $x + \frac{1}{x} = 2$

We get, value of x will be 1

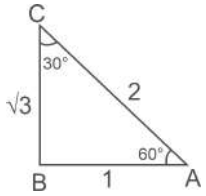
So, $sin\theta = 1$ i.e. θ = 90°

So,

$sin^8 90° + cosec^8 90° = (1)^8 + (1)^8 = 2$

Sol.132.(a) In right angle ΔABC, right angled at B , if

tanA = $\sqrt{3}$



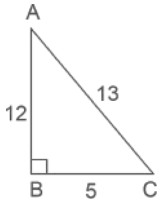
Then sinAcosC + cosAsinC

= $\frac{\sqrt{3}}{2}\times\frac{\sqrt{3}}{2} + \frac{1}{2}\times\frac{1}{2} = \frac{4}{4} = 1$

Sol.133.(a) cos75° + sin15° = 2sin15°

= 2[$\frac{\sqrt{3}-1}{2\sqrt{2}}$] = $\frac{\sqrt{3}-1}{\sqrt{2}}$

Sol.134.(c)



Then sinA = $\frac{5}{13}$, cosA = $\frac{12}{13}$ and

sinC = $\frac{12}{13}$, cosC = $\frac{5}{13}$;

So, sinAcosA = $\frac{60}{169}$ and

sinCcosC = $\frac{60}{169}$

Sol.135.(b) As cotx = 3 ,Then the value of $\frac{(3+3sinx)(1-sinx)}{(2+2cosx)(3-3cosx)}$

= $\frac{3\times(1+sinx)(1-sinx)}{2\times3(1+cosx)(1-cosx)}$

= $\frac{1}{2}\times cot^2x = \frac{9}{2}$

Sol.136.(b) SinA = $\frac{1}{2}$ = sin 30°

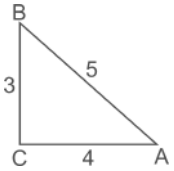
⇒ A = 30°, ⇒ CosB = $\frac{1}{2}$ = cos 60°

B = 60°, ⇒ A + B = 90°

Sol.137.(c) 1 - sin35°cos55°
= 1 - sin35° cos(90° - 35°)
= 1 - sin35°sin35° = 1 - (sin²35°) = cos² 35°

Sol.138.(c) tan2θ = cot(θ + 6°)
tan2θ = tan [90 - (θ + 6°)]
2θ = 84 - θ ⇒ 3θ = 84 ⇒ θ = 28°

Sol.139.(d) A + B = 90^o $and\ sinA = \frac{3}{5}$,



Then, the value of tanB is = $\frac{4}{3}$

Sol.140.(a) sin3θ = cos(θ − 6°)
⇒ sin3θ = sin(90° - θ + 6°)
⇒ 3θ = 96° - θ ⇒ 4θ = 96° ∴ θ = 24°

Sol.141.(a)

= $tan5°\ tan25°\ tan45°\ tan65°\ tan85°$
= (tan5°tan85°)(tan25°tan65°)tan45°
= 1 × 1 × 1 = 1

Sol.142.(d) sin(48° + θ) - cos(42° - θ)
= sin(48° + θ) − $sin(48° + \theta)$ = 0

Sol.143.(c)
tanθtan(90 - θ) = tanθ × $cot\theta = 1$
(tan2°tan88°)(tan3°tan87°) .... (tan43°tan 47°)tan45° = 1 × $tan\ 45°$ = 1

Sol.144.(c) Given,

$\frac{sin\theta + cos\theta}{sin\theta - cos\theta} = \frac{\sqrt{3}-1}{\sqrt{3}+1}$

By applying Componendo & Dividendo ,

$\frac{sin\theta+cos\theta+sin\theta-cos\theta}{sin\theta+cos\theta-sin\theta+cos\theta} = \frac{\sqrt{3}-1+\sqrt{3}+1}{\sqrt{3}-1-\sqrt{3}-1}$

$\Rightarrow \frac{2sin\theta}{2cos\theta} = \frac{2\sqrt{3}}{-2}$

⇒ tanθ = $-\sqrt{3}$ = $tan(360° - 60°)$
Hence, θ = 300°

Sol.145.(c) $\frac{tanA}{1-cotA} + \frac{cotA}{1-tanA}$

= $\frac{\frac{sinA}{cosA}}{1-\frac{cosA}{sinA}} + \frac{\frac{cosA}{sinA}}{1-\frac{sinA}{cosA}}$

= $\frac{Sin^2A}{cosA(sinA-cosA)} + \frac{cos^2A}{sinA(cosA-sinA)}$

= $\frac{Sin^2A}{cosA(sinA-cosA)} - \frac{cos^2A}{sinA(sinA-cosA)}$

= $\frac{sin^3A - cos^3A}{sinAcosA(sinA-cosA)}$

=

$\frac{(SinA-cosA)(Sin^2A+sinAcosA+cos^2A)}{SinAcosA(sinA-cosA)}$

= 1 + secAcosecA

Sol.146.(a) In a triangle with acute angle
Sine : cosine = 5 : 12

Hypotenuse = $\sqrt{12^2 + 5^2}$ = 13

then the value of sine = $\frac{5}{13}$

Sol.147.(a) x = acosecθ + bcotθ ,
y = bcosecθ + acotθ
A/Q
$\Rightarrow x^2 - y^2 = (acosec\theta + bcot\theta)^2 -$

$(bcosec\theta + acot\theta)^2$

$\Rightarrow x^2 - y^2 = (a^2cosec^2\theta + b^2cot^2\theta + 2acosec\theta \times bcot\theta)$

$- (b^2cosec^2\theta + a^2cot^2\theta + 2bcosec\theta \times acot\theta)$

$\Rightarrow x^2 - y^2 = a^2(cosec^2\theta - cot^2\theta)$

$- b^2(cosec^2\theta - cot^2\theta)$

$\Rightarrow x^2 - y^2 = a^2 - b^2$

Sol.148.(a) $\frac{1-tan^2A}{1+tan^2A} = \frac{1-tan^2A}{sec^2A}$

$= \frac{1}{sec^2A} - \frac{tan^2A}{sec^2A}$

$= \cos^2A - \sin^2A = \cos2A$

Sol.149.(b) $\Rightarrow \frac{cosA}{1-sinA} + \frac{cosA}{1+sinA} = 4$

$\Rightarrow \frac{cosA(1+sinA) + cosA(1-sinA)}{(1-sinA)(1+sin\,A)} = 4$

$\Rightarrow \frac{cosA + cosAsinA + cosA - cosAsinA}{1-sinA^2} = 4$

$\Rightarrow \frac{2cosA}{cosA \times cosA} = 4$

$\Rightarrow \cos A = \frac{1}{2} \Rightarrow A = 60°$

Sol.150.(a)

$\left(\frac{sin\,29^0}{cos61^0}\right) - 4\left(cos^231^0 + cos^259^0\right)$

$+ \frac{1}{\sqrt{3}}(tan27^0 sin60° tan63^0)$

$= 1 - 4(1) + \frac{1}{\sqrt{3}} \times 1 \times \frac{\sqrt{3}}{2} = -\frac{5}{2}$

Sol.151.(b) $\tan3\theta tan6\theta = 1$

$\Rightarrow 3\theta + 6\theta = 90° \Rightarrow 9\theta = 90° \Rightarrow \theta = 10°$

Now, $\tan30\theta = tan300° = \tan(270° + 30°)$

$= -\cot30° = -\sqrt{3}$

Sol.152.(a) $2\sin(3x-3)^o = tan240^o$

$\Rightarrow 2\sin(3x - 3)° = \tan(180° + 60°)$

$\Rightarrow 2sin(3x - 3)° = tan\,60°$

$\Rightarrow 2sin(3x - 3)° = \sqrt{3}$

$\Rightarrow sin(3x - 3)° = \frac{\sqrt{3}}{2}$

$\Rightarrow sin(3x - 3)° = sin60°$

$\Rightarrow (3x - 3)° = 60°$

$\Rightarrow 3x = 63° \Rightarrow x = 21°$

Sol.153.(d) Given $\rightarrow \cos(x - y) = \frac{\sqrt{3}}{2}$, and $\sin(x + y) = 1$

$\Rightarrow \cos(x - y) = \frac{\sqrt{3}}{2} \Rightarrow \cos(x - y) = \cos30°$

$\Rightarrow x - y = 30°$ ——— (i)

And $\sin(x + y) = 1$

$\Rightarrow \sin(x + y) = \sin 90°$

$\Rightarrow x + y = 90°$ ——— (ii)

From equation (i) & (ii)

$x = 60°$ and $y = 30°$

Sol.154.(a) $\Rightarrow 1 + \tan\theta = \sqrt{3}$

$\Rightarrow \tan\theta = \sqrt{3} - 1 \Rightarrow \cot\theta = \frac{1}{\sqrt{3}-1}$

Now ,

$\sqrt{3}\cot\theta - 1 \Rightarrow \sqrt{3} \times \frac{1}{\sqrt{3}-1} - 1 = \frac{\sqrt{3}+1}{2}$

Sol.155.(d) $\sin x : \sin y = \frac{1}{\sqrt{2}} : \frac{1}{2}$

$\Rightarrow \text{Sinx : Siny} = \text{Sin45° : sin30°}$

(45 + 30 = 75) … (satisfied)

Then x : y = 45 : 30 = 3 : 2

Sol.156.(c) $cos^231 + cos^259 = cos^231 + cos^2(90° - 31) = cos^231° + sin^231° = 1$

Short Trick:

If Angle A + B=90°

Then, $cos^2A + cos^2B = 1$

So, $cos^231 + cos^259 = 1$

Sol.157.(d)

$a + \frac{1}{a} = k$

$a^3 + \frac{1}{a^3} = k^3 - 3k$

By the using this formula

$\sin\theta + cosec\theta = \sqrt{5}$

$\sin\theta + \frac{1}{sin\theta} = \sqrt{5}$

So that ,

$(sin\theta)^3 + \frac{1}{(sin\theta)^3} = (\sqrt{5})^3 - 3\sqrt{5} = 2\sqrt{5}$

Sol.158.(d) $\tan35°\cot55° + \tan55°\cot35°$

$\tan35°\cot(90 - 35°) + \tan(90 - 35°)\cot 35°$

$= \tan 35°\tan 35° + \cot 35°\cot35°$

$= tan^235° + cot^235°$

$= \frac{1}{(2-\sqrt{3})^2} + (2 - \sqrt{3})^2$ .....

$\left(\frac{1}{(2-\sqrt{3})^2} = \left(2 + \sqrt{3}\right)^2\right)$

$= 4 + 3 + 4\sqrt{3} + 4 + 3 - 4\sqrt{3} = 14$

Sol.159.(b) $\tan1°\tan2°\tan3°$ ..... $\tan 89°$

$= (\tan1°\tan89°)(\tan2°\tan88°)$ .....

... $(\tan44°\tan46°)\tan45°$

$= (\tan1°\tan(90° - 1°))(\tan2°\tan(90° - 2°))$.

..... $(\tan44°\tan(90° - 44°))\tan45°$

$= (\tan1°\cot1°)(\tan2°\cot2°)....(\tan44°\cot 44°)\tan 45° = 1 \times 1$ ..... $\times 1 \Rightarrow 1$

Sol.160.(d) $\sin x - 3\cos x = \sqrt{3}\cos x$

$\Rightarrow sinx = 3cosx + \sqrt{3}cosx$

$\Rightarrow sinx = \sqrt{3}cosx(\sqrt{3} + 1)$

$\Rightarrow \frac{sinx}{cosx} = \sqrt{3}(\sqrt{3} + 1)$

$\Rightarrow tanx = \sqrt{3}(\sqrt{3} + 1)$

$\Rightarrow cotx = \frac{1}{\sqrt{3}(\sqrt{3}+1)} = \frac{1}{3+\sqrt{3}}$

$= \frac{3-\sqrt{3}}{(3+\sqrt{3})(3-\sqrt{3})} = \frac{3-\sqrt{3}}{9-3} = \frac{3-\sqrt{3}}{6}$

Sol.161.(d) $\frac{cos3x + cosx}{sin3x - sinx}$

$= \frac{4cos^3x - 3cosx + cosx}{3sinx - 4sin^3x - sinx}$

$= \frac{4cos^3x - 2cosx}{2sinx - 4sin^3x} = \frac{2cosx(2cos^2x - 1)}{2sinx(1 - 2sin^2x)}$

$= \frac{2cosxcos2x}{2sinxcos2x} = \cot x$

Short Tricks :-

Put , x = 30°

$\frac{cos3x + cosx}{sin3x - sinx} = \frac{0 + \frac{\sqrt{3}}{2}}{1 - \frac{1}{2}} = \sqrt{3}$

$\text{Cot30°} = \sqrt{3}$

Clearly , option (4) satisfy the given equation

Sol.162.(a)

$\sin(A - B) = \frac{1}{2} = \sin30°$---------(i)

$\cos(A + B) = \frac{1}{2} = \cos60°$---------(ii)

From equation (i) and (ii)

$(A - B) = 30°$, $(A + B) = 60°$

$A = 45°$and $B = 15°$

Sol.163.(d) We know that if,

$(1 + \tan A)(1 + \tan B) = 2$ then $A + B = 45°$

$\tan(A + B) = \tan45° = 1$

Sol.164.(b) $\frac{tan45^0 - tan30^0}{1 + tan45^0 tan30^0}$

$= \frac{1 - \frac{1}{\sqrt{3}}}{1 + 1 \times \frac{1}{\sqrt{3}}} = \frac{\sqrt{3}-1}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}+1}$

$= \frac{\sqrt{3}-1}{\sqrt{3}+1} = \frac{(\sqrt{3}-1)^2}{3-1} = \frac{3+1-2\sqrt{3}}{2}$

$= \frac{4-2\sqrt{3}}{2} = 2 - \sqrt{3}$

Sol.165.(d) $\cos\theta + \sec\theta = \sqrt{3}$

$(cos^3\theta + sec^3\theta) = (\sqrt{3})^3 - 3\sqrt{3} = 0$

Sol.166.(c) If $\cot x \times \text{coty} = 1$,

then , $x + y = 90°$

$cot3\theta cot6\theta = 1 \Rightarrow 3\theta + 6\theta = 90°$

$\Rightarrow 9\theta = 90° \Rightarrow \theta = 10°$

Now, $\tan15\theta = \tan150° = \tan(90° + 60°)$

$= -\cot60° = -\frac{1}{\sqrt{3}}$

Sol.167.(d) $cosx + \frac{1}{cosx} = 2$

Put $\cos x = 1$ Now ,

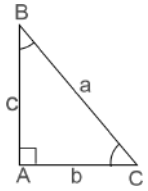
$cos^nx + \frac{1}{cos^nx} = 1 + 1 = 2$

Sol.168.(c) For Minimum value

Put θ = 90° then $11sin^2\theta + 12cos^2\theta$

= $11sin^2 90° + 12\ cos^2 90°$ = 11 + 0 = 11

Sol.169.(d)



On the basis of given triangle

= a(bcosC - ccosB) = a (b × $\frac{b}{a}$ -- c × $\frac{c}{a}$)

⇒ b^2 - c^2

Sol.170.(d)

cos37°sec143° + sin34°cosec146°

= cos37° × $\frac{1}{cos(180° - 37°)}$ + sin34° × $\frac{1}{sin\ (180° - 34°)}$ ⇒ $\frac{cos37°}{-cos37}$ + $\frac{sin34°}{sin34°}$ ⇒ − 1 + 1 ⇒ 0

Sol.171.(a) $cos^{-1}(\frac{1}{\sqrt{2}}) + sec^{-1}(-\sqrt{2})$

= $\frac{\pi}{4} + \frac{3\pi}{4} = \pi$

Sol.172.(a) Cos $(sec^{-1}x + cosec^{-1}x)$

Let, x = 1, Cos $(sec^{-1}1 + cosec^{-1}1)$

Cos $(sec^{-1}sec0° + cosec^{-1}cosec90°)$

Cos(0 ° + 90°) ⇒ Cos90° = 0

Sol.173.(c) $\sqrt{2}$sin(5x - 5)° = tan 45°

$\sqrt{2}$sin(5x - 5)° = 1

⇒ $sin(5x - 5)° = \frac{1}{\sqrt{2}}$ = sin 45°

⇒ $5x - 5 = 45$

⇒ $5x = 50$, ⇒ $x = 10$

Sol.174.(d) cot(A + B)cot(A -- B) = 1

Then (A + B) + (A -- B) = 90°

2A = 90° ⇒ A = 45°

Now , cot($\frac{2A}{3}$) ⇒ cot($\frac{2 \times 45}{3}$)

⇒ $cot\ 30°$ ⇒ $\sqrt{3}$

Sol.175.(d) tan($\frac{13\pi}{12}$) = tan($\pi + \frac{\pi}{12}$) = tan 15° = 2 − $\sqrt{3}$

Sol.176.(b) cosx = - $\frac{3}{5}$, $sin^2x = 1 - cos^2x$

⇒ $Sin^2x = 1 - \frac{9}{25} = \frac{16}{25}$

⇒ Sinx = $\pm \frac{4}{5}$ Since Sin x lies in the third quadrant so sin x is negative.

Hence , - $\frac{4}{5}$ is the answer.

Sol.177.(c) tanθ = $\frac{b}{a}$

Hypotenuse = $\sqrt{a^2 + b^2}$

Now , $\frac{acos\theta + bsin\theta}{acos\theta - bsin\theta}$

= $\frac{a(\frac{a}{\sqrt{a^2+b^2}}) + b(\frac{b}{\sqrt{a^2+b^2}})}{a(\frac{a}{\sqrt{a^2+b^2}}) - b(\frac{b}{\sqrt{a^2+b^2}})} = \frac{a^2 + b^2}{a^2 - b^2}$

Sol.178.(a) tan75° = tan(45° + 30°)

= $\frac{tan45° + tan30°}{1 - tan45°tan30°} = \frac{1 + \frac{1}{\sqrt{3}}}{1 - 1 \times \frac{1}{\sqrt{3}}}$

= $\frac{\sqrt{3}+1}{\sqrt{3}-1} \times \frac{\sqrt{3}+1}{\sqrt{3}+1} = \frac{3+1+2\sqrt{3}}{3-1}$

= 2 + $\sqrt{3}$

Now , $\frac{1 + tan75^o}{1 - tan75^o} = \frac{1+2+\sqrt{3}}{1-2-\sqrt{3}} = -\sqrt{3}$

Sol.179.(c) $cosec^4\theta = 49 + cot^4\theta$

⇒ $cosec^4\theta - cot^4\theta = 49$

⇒ $(cosec^2\theta - cot^2\theta)(cosec^2\theta + cot^2\theta) = 49$

⇒ $(cosec^2\theta + cot^2\theta) = 49$

⇒ $2cosec^2\theta - 1 = 49$ ⇒ $cosec^2\theta = 25$

⇒ cosecθ = 5 so that ⇒ sinθ = $\frac{1}{5}$

Sol.180.(b) $tan\theta - cot\theta = x$

and cosθ -- sinθ = y, Put $\theta = 45°$

$x = 0\ and\ y = 0$

Now, $(x^2 + 4)(y^2 - 1)^2 = 4 \times 1 = 4$

Sol.181.(a) $sin78^0 + cos132^0$

= $sin78^0$ + cos(90° + 42°)

= $sin78^0$ − sin 42°

Formula used:

[sina ± sinb = 2sin$\frac{1}{2}$(a ± b)cos$\frac{1}{2}$(a ∓ b)]

= 2cos60° × sin18° ⇒ sin18°

Sol.182.(c)

$sin1^0 sin2^0 sin3^0 ..... sin180^0 ..... sin196^0$

Where, sin180° = 0, So that

$sin1^0 sin2^0 sin3^0 ..... sin180^0 ..... sin196^0 = 0$

Sol.183.(c) tanθ = - $\frac{12}{5}$,

we know that tanθ = $\frac{P}{B}$

Now , H = 13, Sinθ = $\frac{P}{H}$ = − $\frac{12}{13}$

Sol.184.(a) cosθ = cos α

cosθ − cosα = 0

Now ,

→ − 2sin($\frac{\theta + \alpha}{2}$) × sin($\frac{\theta - \alpha}{2}$) = 0

We get two condition

(i) sin($\frac{\theta + \alpha}{2}$) = 0

and (ii) sin($\frac{\theta - \alpha}{2}$) = 0

For condition (i) $\frac{\theta + \alpha}{2}$ = nπ

⇒ θ = 2nπ - α

For conditi. (ii) $\frac{\theta - \alpha}{2}$ = nπ ⇒ θ = 2nπ + α

From equation (i) & (ii) θ = 2nπ ± α , n ∈ Z

Sol.185.(d) sinθ - cosθ = $\frac{\sqrt{3}}{2}$,

Let , sinθ + cosθ = y,

⇒ $a^2 + b^2 = x^2 + y^2$

⇒ $1^2 + 1^2 = \left(\frac{\sqrt{3}}{2}\right)^2 + y^2$

⇒ $y^2 = 2 - \frac{3}{4} = \frac{8-3}{4} = \frac{5}{4}$

⇒ $y = \frac{\sqrt{5}}{2}$

Sol.186.(c) cosA + secA = $\frac{5}{2}$

Given that A is acute angle so we can put A = 60°

Now, sinA + cosecA = sin60° + cosec60°

= $\frac{\sqrt{3}}{2} + \frac{2}{\sqrt{3}} = \frac{3+4}{2\sqrt{3}} = \frac{7}{2\sqrt{3}}$

Sol.187.(d) $\frac{sec\theta + tan\theta}{sec\theta - tan\theta} = \frac{5}{3}$

⇒ $3sec\theta + 3tan\theta = 5sec\theta - 5tan\theta$

⇒ $8tan\theta = 2sec\theta$ ⇒ $\frac{4sin\theta}{cos\theta} = \frac{1}{cos\theta}$

⇒ $sin\theta = \frac{1}{4}$

Sol.188.(b) sinAcosA(tanA − cotA)

= $sin^2A - cos^2A = sin^2A - (1 - sin^2A)$

= 2sin²A - 1

Sol.189.(a) sin2A = cos 75°

⇒ $sin2A$ = sin15° ⇒ $2A = 15°$ ⇒ A = 7.5°

Sol.190.(c) If A + B = 45°

Since, tan(A + B) = $\frac{tanA + tanB}{1 - tanAtanB}$

⇒ tan 45° = $\frac{tanA + tanB}{1 - tanAtanB}$

⇒ 1 - tanAtanB = tanA + tanB

⇒ 1 = tanA + tanB + tanAtanB

Adding 1 on both sides,we have

⇒ 2 = 1 + tanA + tanB + tanAtanB

⇒ 2 = tanA(1 + tanB) + 1(1 + tanB)

⇒ 2 = (1 + tanA)(1 + tanB)

Then, (1 + tanA)(1 + tanB) = 2

Sol.191.(b) cos 42° = p = $\frac{base}{Hypotenuse}$

Perpendicular = $\sqrt{1 - p^2}$

Now, tan 48° = tan(90° - 42°) = cot42°

cot42° = $\frac{p}{\sqrt{1-p^2}}$ so , tan48° = $\frac{p}{\sqrt{1-p^2}}$

Sol.192.(a) Cosx - 3sinx = $\sqrt{3}$sinx

⇒ $\frac{cosx - 3sinx}{Sinx} = \sqrt{3}$

$\Rightarrow \frac{cosx}{sinx} - \frac{3sinx}{sinx} = \sqrt{3} \Rightarrow$ Cotx - 3 = $\sqrt{3}$

$\Rightarrow$ Cotx = $\sqrt{3}$ + 3

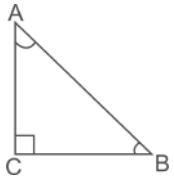
$\Rightarrow$ tanx = $\frac{1}{\sqrt{3}+3} = \frac{3-\sqrt{3}}{6}$

Sol.193.(c) For greatest value , putting x = 45°

$\Rightarrow$ Sin45° + cos45° = $\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}} = \sqrt{2}$

Sol.194.(b) sin15°sin30°sin75°
= sin15°sin75°sin30°
= sin15° × sin(90° - 15°) × sin30°
= sin15° × cos15° × sin30°
= $\frac{1}{2}$ × 2 × sin15° × cos15° × sin30°
= $\frac{1}{2}$sin(2 × 15°) × sin30°
= $\frac{1}{2}$sin30° × sin30° = $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{8}$

Sol.195.(c)



∠C = 90° , ∠A = ∠B = 45°
Now, sinAsinB + cosAcosB
= sin45°sin45° + cos45°cos45°
= $\frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} = \frac{1}{2} + \frac{1}{2}$ = 1

Sol.196.(d)

$cot19^o(cot71^o cos^2 21^o + \frac{1}{tan71^o sec^2 69^o})$

= cot19°(cot 71°$cos^2$21° + $\frac{cot\ 71°}{sec^2 69°}$)

= $cos^2 21° + \frac{1}{sec^2 69°} = cos^2 21° + cos^2 69°$

= $cos^2 21° + sin^2 21°$ = 1

Sol.197.(d) We know that tanAtanB = 1 if A + B = 90
$tan11^0 tan41^0 tan45^0 tan49^o tan79^0$ = 1

Sol.198.(a) sinθ = cosθ
[θ are same in sin θ and cosθ so that θ = 45°]
2cot²θ + sin²θ - 1 = 2cot²45° + sin²45° - 1
= 2 × 1 + $\frac{1}{2}$ - 1 = 2 + $\frac{1}{2}$ − 1
= 1 + $\frac{1}{2} = \frac{3}{2}$

Sol.199.(d) $\sqrt{\frac{1-cos2\theta}{1+cos2\theta}} = \frac{1}{\sqrt{3}}$

$\Rightarrow \frac{1-cos2\theta}{1+cos2\theta} = \frac{1}{3}$

$\Rightarrow$ 3 - 3cos2θ = 1 + cos2θ

$\Rightarrow$ 2 = 4cos2θ $\Rightarrow$ cos2θ = $\frac{1}{2} \Rightarrow \theta = 30°$

2θ will lie in the 1st quadrant because all trigonometric values are positive in the 1st quadrant.

$\Rightarrow \theta = n\pi + \frac{\pi}{6}$

Sol.200.(b) tan15° = 2 - $\sqrt{3}$

$\Rightarrow$ cot15° = $\frac{1}{2-\sqrt{3}} \times \frac{2+\sqrt{3}}{2+\sqrt{3}}$

= $\frac{2+\sqrt{3}}{4-3}$ = 2 + $\sqrt{3}$

So, tan15°cot75° + tan75°cot15°
= tan15°cot(90° - 15°) + tan(90° - 15°)cot15°
= tan15°tan15° + cot15°cot15°
= $tan^2 15° + cot^2 15°$
= $(2 - \sqrt{3})^2 + (2 + \sqrt{3})^2$
= 4 + 3 - 4$\sqrt{3}$ + 4 + 3 + 4$\sqrt{3}$ = 14

Sol.201.(c) 5sinθ + 12cosθ = 13.....(1)
Let , $5cos\theta - 12sin\theta = x$.....(2)
Squaring both side & adding ,We get
$5^2 + 12^2 = 13^2 + x^2$
$\Rightarrow$ 25 + 144 = 169 + x^2 $\Rightarrow x^2 = 0 \Rightarrow x = 0$

Sol.202.(d) Given , θ = 60°
Now , $\frac{2\,cot^2\theta}{1-cot^2\theta} = \frac{2\,cot^2 60°}{1-cot^2 60°}$

= $\frac{2 \times \frac{1}{3}}{1-\frac{1}{3}} = \frac{2}{3} \times \frac{3}{2}$ = 1

Sol.203.(c) 13sinA - 12 = 0, sinA = $\frac{12}{13}$
Where, P, B and H = 12, 5 and 13(by the help of triplet) cos A = $\frac{-5}{13}$
Now , putting the value of sinA and cos A in below equation
= 5sinA + 12cosA + tan²A - (sec²A - 1)
= 5 × $\frac{12}{13}$ + 12 × $\frac{-5}{13}$ + tan²A - tan²A
= $\frac{60}{13} - \frac{60}{13}$ + tan²A - tan²A = 0

Sol.204.(b) $\sqrt{\frac{1-cos300°}{2}}$

= $\sqrt{\frac{1-cos(270°+30°)}{2}} = \sqrt{\frac{1-sin30°}{2}}$

= $\sqrt{\frac{1-\frac{1}{2}}{2}} = \sqrt{\frac{\frac{1}{2}}{2}} = \frac{1}{2}$

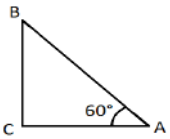
Sol.205.(c) sin($\frac{5\pi}{3}$) = sin(300°)

= sin(360° - 60°) = - sin60° = − $\frac{\sqrt{3}}{2}$

Sol.206.(b) In triangle ABC, lengths of sides opposite to respective angles are a = 25 , b = 45 , c = 30, As we know :
cosA = $\frac{b^2 + c^2 - a^2}{2bc}$ Then ,

$\Rightarrow$ CosA = $\frac{45^2 + 30^2 - 25^2}{2 \times 45 \times 30} = \frac{23}{27}$

Sol.207.(a)



Here ABC is a right - angled triangle , right angled at C. If A = 60° and AC = 20 $\sqrt{3}$ units , i.e. $cos60° = \frac{20\sqrt{3}}{AB}$
Then AB = $20\sqrt{3} \times 2 = 40\sqrt{3}$ units.

Sol.208.(b) sinθ + $cos\theta = \sqrt{3}$cos(90 - θ)
sinθ + $cos\theta = \sqrt{3}sin\theta$ [Dividing both sides by sinθ]
$\frac{sin\theta}{sin\theta} + \frac{cos\theta}{sin\theta} = \sqrt{3} \Rightarrow 1 + cot\theta = \sqrt{3}$
$\Rightarrow$ cotθ = $\sqrt{3}$ - 1 $\Rightarrow$ tanθ = $\frac{1}{\sqrt{3}-1}$

Sol.209.(c) sec(2100°
= sec(360 × 5 + 300)° = $sec(300)^o$
= $sec(360 - 60)^o = sec(60)^o$ = 2

Sol.210.(d)
cos100°cos40° + sin100°sin40°
(cos(A - B) = cosAcosB + sinAsinB)
= cos(100° - 40°) = cos 60° = $\frac{1}{2}$

Sol.211.(d) $9sin^2\theta + 10cos^2\theta$
= $9sin^2\theta$ + 10(1 - $sin^2\theta$)
= $9sin^2\theta$ + 10 - $10sin^2\theta$
= − $sin^2\theta$ + 10 (for least value of the equation value $sin^2\theta$ must be equal to 1)
= − 1 + 10 = 9

Sol.212.(c) $cos^2\theta + sin^2\theta = 1$
cosθ × cosθ + sinθ × sinθ = 1 ------- (i)
$2xycos\theta + (x^2 - y^2)\,sin\theta = x^2 + y^2$
$\frac{2xy}{x^2+y^2}cos\theta + (\frac{x^2-y^2}{x^2+y^2})sin\theta = 1$ ------- (ii)
From equation (i) and (ii)
cosθ = $\frac{2xy}{x^2+y^2} = (\frac{b}{h})$,
sinθ = $\frac{x^2-y^2}{x^2+y^2} = (\frac{p}{h})$
Then , tanθ = $\frac{x^2-y^2}{2xy} = (\frac{p}{b})$

Sol.213.(b)
$tan(100° + 125°) = \frac{tan100° + tan\,125°}{1 - tan100°tan\,125°}$
$\Rightarrow tan\ 225° = \frac{tan100° + tan\,125°}{1 - tan\ 100°tan\,125°}$
$\Rightarrow 1 = \frac{tan100° + tan\,125°}{1 - tan\ 100°tan\,125°}$
$\Rightarrow 1 - tan100°\ tan\,125°$

$= tan100° + tan\ 125°$

⇒ 1 = tan100° + tan125° + tan100° tan125°

Sol.214.(b)

2sinAcosB = sin(A + B) + sin(A - B)

= Sin21° cos9° - cos84° cos6°

= sin 21°cos9° - sin6°cos6°

$= \frac{1}{2}$(2sin 21°cos9° - 2sin6°cos6°)

$= \frac{1}{2}$(sin30° + sin12° - sin12° - sin0°)

$= \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

Sol.215.(b)

$Sin(\alpha + \beta) = sin\alpha cos\beta + cos\alpha sin\beta$

$= \frac{1}{\sqrt{5}} \times \frac{3}{\sqrt{10}} + \frac{2}{\sqrt{5}} \times \frac{1}{\sqrt{10}}$

$= \frac{3}{\sqrt{50}} + \frac{2}{\sqrt{50}} = \frac{5}{5\sqrt{2}} = \frac{1}{\sqrt{2}}$

$\Rightarrow sin(\alpha + \beta) = \frac{1}{\sqrt{2}} = sin45°$

$\Rightarrow \alpha + \beta = 45°$

Sol.216.(d) sinθ + cosθ = 1

Put $\theta = 0°$

$\theta = 0°$ satisfy the given equation

Now , $tan2\theta = tan0° = 0$

Sol.217.(d) = $sin34^o + cos64^o - cos4^o$

= sin34° + cos(34° + 30°) - cos(34° - 30°)

Appling formula

[Cos(A + B) = cosAcosB - sinAsinB

Cos(A - B) = cosAcosB + sinAsinB]

= sin34° + cos34°cos30° - sin34°sin30° – cos34°cos30° – sin34°sin30°

= sin34° - 2sin34°sin30°

$= sin34° - 2sin34° \times \frac{1}{2}$

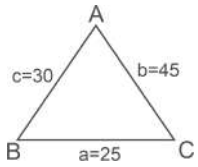
= sin34° - sin34° = 0

Sol.218.(c) sinθ + cosθ = p and secθ + cosecθ = q , Put θ = 45°

P = $\sqrt{2}$, and q = $2\sqrt{2}$

Now, q(p² - 1) = $2\sqrt{2}(2 - 1) = 2\sqrt{2} = 2p$

Sol.219.(d)



Using cosine formula:

$CosA = \frac{b^2 + c^2 - a^2}{2bc} = \frac{45^2 + 30^2 - 25^2}{2 \text{ x } 45 \text{ x } 30}$

$= \frac{2925 - 625}{2700} = \frac{2300}{2700} = \frac{23}{27}$

Sol.220.(b) $sinA = \frac{4}{\sqrt{17}} = \frac{p}{h}$

b = 1 , tanA = 4

$tan2A = tan(A + A) = \frac{tanA + tanA}{1 - tanAtanA}$

$= \frac{4 + 4}{1 - 16} = -\frac{8}{15}$

Sol.221.(a) We know that

$cosec^2A - cot^2A = 1$

$\Rightarrow (cosecA - cotA)(cosecA + cotA) = 1$

$\Rightarrow cosecA - cotA = \frac{1}{3}$

Sol.222.(d)

sinA + SinB = x and cosA + cosB = y

$(SinA + sinB)^2 + (CosA + CosB)^2 = x^2 + y^2$

$\Rightarrow sin^2A + sin^2B + 2sinAsinB + cos^2A + cos^2B + 2cosAcosB = x^2 + y^2$

$\Rightarrow 1 + 1 + 2(sinAsinB + cosAcosB) = x^2 + y^2$

$\Rightarrow 2 + 2(sinAsinB + cosAcosB) = x^2 + y^2$

$\Rightarrow 2cos(A - B) = x^2 + y^2 - 2$

$\Rightarrow cos(A - B) = \frac{x^2 + y^2 - 2}{2}$

Sol.223.(c) $cos(x + y) = \frac{1}{2} = cos60°$

$\Rightarrow x + y = 60$ ___(1)

sin(x - y) = 0 = sin0°

$\Rightarrow x - y = 0$ ___(2)

On solving equation (1) and (2), we get

x = 30° and y = 30°

Sol.224.(c) Sin15° = Sin (45 – 30)°

= Sin45Cos30 - Cos45Sin30

$= \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2} - \frac{1}{\sqrt{2}} \times \frac{1}{2} = \frac{\sqrt{6} - \sqrt{2}}{4}$

Sol.225.(c) $cot(15^o) - tan(15^o)$

$= 2 + \sqrt{3} - (2 - \sqrt{3}) = 2\sqrt{3}$

Sol.226.(a) cosx - 3sinx = $\sqrt{3}$sinx

$dividing\ by\ sinx$

$cotx - 3 = \sqrt{3} \Rightarrow cotx = 3 + \sqrt{3}$

$\Rightarrow tanx = \frac{1}{3 + \sqrt{3}} \times \frac{3 - \sqrt{3}}{3 - \sqrt{3}}$

$= \frac{3 - \sqrt{3}}{9 - 3} = \frac{3 - \sqrt{3}}{6}$

Sol.227.(a)

$tan(\alpha + \beta) = \frac{tan\alpha + tan\beta}{1 - tan\alpha tan\beta}$

$= \frac{\frac{5}{3} + 4}{1 - \frac{5}{3} \times 4} = \frac{17}{3} \times \frac{3}{-17} = -1$

$tan(\alpha + \beta) = -1 = tan\ 135°$

$\Rightarrow \alpha + \beta = 135°$

Sol.228.(c) acosθ+ bsinθ = 5 ------- (i)

bcosθ - asinθ = 3 --------(ii)

Squaring and adding equation (i) and (ii)

$\Rightarrow (a^2cos^2\theta + b^2sin^2\theta + 2abcos\theta\ sin\theta) + (b^2cos^2\theta + a^2sin^2\theta - 2abcos\theta\ sin\theta) = 25 + 9$

$\Rightarrow a^2(cos^2\theta + sin^2\theta) + b^2(cos^2\theta + sin^2\theta) = 25 + 9 \Rightarrow a^2 + b^2 = 34$

Sol.229.(c) (cosecθ + cotθ) x (1- cosθ)

$= (\frac{1}{sin\theta} + \frac{cos\theta}{sin\theta}) \times (1 - cos\theta)$

$= (\frac{1 + cos\theta}{sin\theta}) \times (1 - cos\theta)$

$= \frac{1 - cos^2\theta}{sin\theta} = \frac{sin^2\theta}{sin\theta} = sin\theta$

Sol.230.(a) secθ + tanθ = 2 - $\sqrt{3}$ ---- (i)

$Sec\theta - tan\theta = \frac{1}{2 - \sqrt{3}}$

$Sec\theta - tan\theta = \frac{1}{2 - \sqrt{3}} \times \frac{2 + \sqrt{3}}{2 + \sqrt{3}}$

Secθ - tanθ = 2 + $\sqrt{3}$ ------- (ii)

Adding equation (i) and (ii)

$2sec\theta = 4 \Rightarrow sec\theta = 2 = \frac{H}{B}$ (H = 2 , B = 1)

Then , P = $\sqrt{4 - 1} = \sqrt{3}$

Hence,

$\sqrt{3}sin\theta + cos\theta$

$= \sqrt{3} \times \frac{\sqrt{3}}{2} + \frac{1}{2} = 2$

Sol.231.(b) 3tanθ = 2

$tan\theta = \frac{2}{3} = \frac{perpendicular}{base}$

$sin\theta = \frac{2}{\sqrt{13}}$ and $cos\theta = \frac{3}{\sqrt{13}}$

Then, putting the value of sinθ, cosθ and tanθ in following equation

$\frac{(\sqrt{13}sin\theta - 3tan\theta)}{(3tan\theta + \sqrt{13}cos\theta)}$

$= \frac{(\sqrt{13} \times \frac{2}{\sqrt{13}} - 3 \times \frac{2}{3})}{(3 \times \frac{2}{3} + \sqrt{13} \times \frac{3}{\sqrt{13}})} = 0$

Sol.232.(c) $cos^4\theta - sin^4\theta = \frac{3}{5}$

$(cos^2\theta - sin^2\theta)(cos^2\theta + sin^2\theta) = \frac{3}{5}$

$Cos2\theta = \frac{3}{5}$, (B = 3 , H = 5 and P = 4)

$Sin2\theta = \frac{4}{5}$

$Cos2\theta + Sin2\theta = \frac{3}{5} + \frac{4}{5} = \frac{7}{5}$

Sol.233.(a) Given , tanθ + cotθ= 2 and θ is acute angle Let , θ = 45°

tanθ + cotθ = 2 = 1 + 1 = 2 (satisfied)

So, on putting the value θ = 45°

$tan^{15}\ \theta + cot^{20}\theta + 2tan^{20}\theta cot^{15}\theta$

= 1 + 1 + 2 = 4

Sol.234.(b) Given , tanA + tanB = p and cotA + cotB = q , tanA + tanB = p

$\frac{1}{cot\ A} + \frac{1}{cotB} = p \Rightarrow \frac{q}{cotA \times cotB} = p$

$\frac{q}{p} = cotA \times coB$ ------(i)

Cot (A + B) = $\frac{cotAcotB-1}{CotB+cotA}$

Cot(A + B) = $\frac{cotAcotB-1}{q}$ -----(ii)

From equation (i) and (ii)

cot(A + B) = $\frac{q-p}{pq}$

Sol.235.(d)

$cos^2A + cos^2B = 1$ if , A + B = 90°

$cos^2 3^o + cos^2 4^o + cos^2 5^o + ... + cos^2 87^o$

= 42 + $\frac{1}{2} = \frac{85}{2}$

$cos^2 3^o + cos^2 4^o + cos^2 5^o + ...+ cos^2 87^o$

We know that $cos^2A + cos^2B = 1$

If A + B = 90° = 42 + $\frac{1}{2} = \frac{85}{2}$

Sol.236.(c) (1 - cosP)(1 + cosP) = $\frac{3}{4}$

$\Rightarrow 1 - cos^2 P = \frac{3}{4} \Rightarrow sin^2 P = \frac{3}{4}$

$\Rightarrow sinP = \frac{\sqrt{3}}{2}$ = sin 60° ⇒ P = 60°

Now, sec 60° = 2

Sol.237.(c) $2(cos\theta + sec\theta) = 5$

$\Rightarrow cos\theta + sec\theta = \frac{5}{2}$

Let $cos\theta = x$

$x + \frac{1}{x} = \frac{5}{2} \rightarrow x^2 + \frac{1}{x^2} = (\frac{5}{2})^2 - 2$

$= \frac{25}{4} - 2 = \frac{25-8}{4} = \frac{17}{4}$

Sol.238.(d) x = 3cosAcosB

$\Rightarrow x^2 = 9cos^2A\ cos^2B$

y = 3cosAsinB $\Rightarrow y^2 = 9cos^2Asin^2B$

z = 3sinA $\Rightarrow z^2 = 9sin^2A$

Now, $x^2 + y^2 + z^2$

$= 9cos^2A\ cos^2B + 9cos^2A\ sin^2B + 9sin^2A$

$= 9cos^2A(cos^2B + sin^2B) + 9sin^2A$

$= 9cos^2A + 9sin^2A$

$= 9(cos^2A + sin^2A) = 9$

Sol.239.(b)

$sin^2 5^o + sin^2 10^o + sin^2 80^o + sin^2 85^o$

= $sin^2 5° + sin^2 10° + sin^2(90° - 10°) + sin^2(90° - 5°)$

= $sin^2 5^o + sin^2 10^o + cos^2 10^o + cos^2 5^o$

= 1 + 1 = 2

Sol.240.(c) $sec\theta + tan\theta = 2 + \sqrt{3}$

θ= 60° satisfies the above condition

Hence , cosθ = cos60° = $\frac{1}{2}$

Sol.241.(a) $tan(15^o) = 2 - \sqrt{3}$

Sol.242.(c) $tan75^o - cot75^o$

= $(2 + \sqrt{3}) - (2 - \sqrt{3}) = 2\sqrt{3}$

Sol.243.(c) As we know :

$cos90^o = 0$

Then the value of the following:

$cos1^o cos2^o cos3^o ... cos89^o cos90^o = 0$

Sol.244.(b) $tan\theta = -\frac{4}{3} = \frac{p}{b}$, h = 5

Now, $sin\theta = \frac{4}{5}$ or $-\frac{4}{5}$

Sol.245.(c)

$\frac{tan1^o tan2^o tan3^o ..... tan89^o}{tan45^o} = \frac{1}{1} = 1$

Sol.246.(a) $tan\theta = \frac{\sqrt{3}+1}{2}$, $cot\theta = \frac{2}{\sqrt{3}+1}$

Now, $2\sqrt{3}cot\theta + 1 = 2\sqrt{3} \times \frac{2}{\sqrt{3}+1} + 1$

$= \frac{4\sqrt{3}+\sqrt{3}+1}{\sqrt{3}+1} = \frac{5\sqrt{3}+1}{\sqrt{3}+1}$

Sol.247.(a)

$sin\frac{7\pi}{4}\ sin\frac{\pi}{4}\ sin\frac{3\pi}{4}\ sin\frac{5\pi}{4}$

$= sin(2\pi - \frac{\pi}{4})\ sin\frac{\pi}{4}\ sin(\pi - \frac{\pi}{4})$

$sin(\pi + \frac{\pi}{4})$

$= (-sin\frac{\pi}{4})\ sin\frac{\pi}{4}\ sin\frac{\pi}{4}(-sin\frac{\pi}{4})$

$= (-\frac{1}{\sqrt{2}}) \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} \times (-\frac{1}{\sqrt{2}}) = \frac{1}{4}$

Sol.248.(d) Put , θ = 90°

cos^2 θ - 3 cos θ + 2 = $2sin^2$ θ

cos^2 90° - 3 cos 90° + 2 = $2sin^2$ 90°

$\Rightarrow 0 - 0 + 2 = 2 \Rightarrow 2 = 2$

L.H.S = R.H.S

Sol.249.(c) sin 120° sin 240° sin 270°

= sin (90 + 30)° sin (180 + 60)° sin 270°

= cos 30° (- sin 60°) (- sin 90°)

= $\frac{\sqrt{3}}{2} \times \frac{-\sqrt{3}}{2} \times -1 = \frac{3}{4}$

Sol.250.(c) tan (60° - θ) - cot (30° + θ)

= tan [90° - (30° + θ)] - cot (30° + θ)

= cot (30° + θ) - cot (30° + θ) = 0

Sol.251.(a) tan 2A = cot(A - 18°)

tan 2A = tan (90 - A + 18)

2A = 108 - A ⇒ 3A = 108 ⇒ A = 36°

Sol.252.(d)

cos 18° + cos 162° + sin 126° + sin 234°

= cos 18° + cos (180 - 18)° + sin (180 - 54)° + sin (180 + 54)°

= cos 18° - cos 18° + sin 54° - sin 54° = 0

Sol.253.(b) Formula :- Sin (A + B) = sinA cosB + cosA sinB

Sin 75° = sin (30 + 45)° = sin 30°cos 45° + cos 30° sin 45°

= $\frac{1}{2} \times \frac{1}{\sqrt{2}} + \frac{\sqrt{3}}{2} \times \frac{1}{\sqrt{2}} = \frac{1}{2\sqrt{2}} + \frac{\sqrt{3}}{2\sqrt{2}}$

= $\frac{\sqrt{3}+1}{2\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{6}+\sqrt{2}}{4}$

Sol.254.(b) Given,

sin(180° - θ) cos (90° - θ) – cos (180° - θ) sin (90° - θ)

We know sin(180° - θ) = sin θ ,

cos (180° - θ) = - cos θ ,

cos (90° - θ) = sin θ and

sin (90° - θ) = cos θ

Putting all the values in the given equation we get,

sin θ × sin θ - (- cosθ) × cos θ

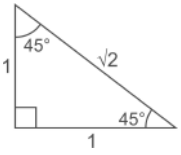
Sin^2 θ + cos^2 θ = 1

Sol.255.(c) cos 5° + cos 24° + cos 175° + cos 204° + cos 300°

= cos 5° + cos 24° + cos(180° − 5°) + cos (180° + 24°) + cos(360° − 60°)

= cos 5° + cos 24° − cos 5° − cos 24° + cos 60° ⇒ cos 60° = $\frac{1}{2}$

Sol.256.(a)



(cos A cos B - sin A sin B) = cos(A + B)

cos(45° + 45°) = cos(90°) = 0

Sol.257.(a) tan A = $\frac{perpendicular}{base} = \frac{3}{4}$

Hypotenuse (H) = $\sqrt{3^2 + 4^2} = 5$

Now, tanB = $\frac{5}{12}$

Hypotenuse(H) = $\sqrt{5^2 + 12^2} = 13$

cos(A + B) = cosAcosB − sinAsinB

$\frac{4}{5} \times \frac{12}{13} - \frac{3}{5} \times \frac{5}{13} = \frac{33}{65}$

Sol.258.(d)

$\frac{cos\theta(1 + sin\theta + 1 - sin\theta)}{1 - sin^2\theta} = 4$

$\frac{cos\theta \times 2}{cos^2\theta} = 4 \Rightarrow \frac{2}{cos\theta} = 4$

$cos\theta = \frac{1}{2} \Rightarrow \theta = 60°$

Sol.259.(d) Given that , A + B = 90° then Put A = 45° and B = 45°

$\frac{\sqrt{tan\ A\ tan\ B + tanA\ cot\ B}}{Sin\ A\ Sec\ B}$

= $\frac{\sqrt{1+1}}{\frac{1}{\sqrt{2}} \times \sqrt{2}} = \sqrt{2}$

Putting the values of A and B in option , only(d) is satisfy

Sol.260.(d) Identity:- $(sec^2\theta - tan^2\theta) = 1$

$(x)^2 = (a\sec\theta + b\tan\theta)^2$

$(x)^2 = a^2sec^2\theta + b^2tan^2\theta + 2ab\sec\theta\tan\theta$ .....e.q .(1)

$(y)^2 = (a\tan\theta + b\sec\theta)^2$

$(y)^2 = a^2tan^2\theta + b^2sec^2\theta + 2ab\sec\theta\tan\theta$ .....e.q . (2)

Subtract eq .(2) from eq .(1)

$(x)^2 - (y)^2 = a^2sec^2\theta + b^2tan^2\theta + 2ab\sec\theta\tan\theta - a^2tan^2\theta - b^2sec^2\theta - 2ab\sec\theta\tan\theta$

$(x)^2 - (y)^2 = a^2(sec^2\theta - tan^2\theta) + b^2(tan^2\theta - sec^2\theta)$

$(x)^2 - (y)^2 = a^2 - b^2$

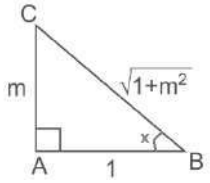
Sol.261.(c)Formula:- $\sin\theta = \cos(90 - \theta)$

$(\frac{\sin 47^\circ}{\cos 43^\circ})^2 + (\frac{\cos 43^\circ}{\sin 47^\circ})^2 - 4\cos^2 45^\circ$

$= (\frac{\cos 43^\circ}{\cos 43^\circ})^2 + (\frac{\sin 47^\circ}{\sin 47^\circ})^2 - 4\left(\frac{1}{\sqrt{2}}\right)^2$

$= 1 + 1 - 4 \times \frac{1}{2} \Rightarrow 2 - 2 = 0$

Sol.262.(c)



$\sin x = \frac{m}{\sqrt{1+m^2}} = \frac{Perpendicular}{Hypotenuse}$

$\tan x = \frac{Perpendicular}{Base} = \frac{m}{1} = m$

Sol.263.(c) If (A + B) = 90° , then

(i) Sin A = Cos B

(ii) Cosec A = Sec B

Here , {30°17'} + { 59°43'} = 90°

Then , $\sin 30°17' = \cos 59°43'$

$\frac{\sin 30°17'}{\cos 59°43'} - \frac{cosec\ 32°}{sec\ 58°} \Rightarrow 1 - 1 = 0$

Sol.264.(c)

$\frac{\tan A}{(1+\tan^2 A)^2} + \frac{\cot A}{(1+\cot^2 A)^2}$

$= \frac{\sin A}{\cos A} \times \cos^4 A + \frac{\cos A}{\sin A} \times \sin^4 A$

$= \sin A \times \cos^3 A + \cos A \times \sin^3 A$

$= \sin A \cos A (\cos^2 A + \sin^2 A) = \sin A \cos A$

Sol.265.(d) Formula:- $\sin(A + B) + \sin(A - B) = 2\sin A\cos B$

$\sin(30° - A) + \sin(30° + A) \Rightarrow 2\sin 30°\cos A = 2 \times \frac{1}{2} \times \cos A = \cos A$

Sol.266.(a) $(1 - \sin^2\theta)(\tan^2\theta + 1) - 1$

$= \cos^2\theta \times \sec^2\theta - 1$

$= \frac{1}{sec^2\theta} \times \sec^2\theta - 1 = 0$

Sol.267.(a) If $\operatorname{cosec}\alpha = \sqrt{2}$,then,

$\sin\alpha = \frac{1}{\sqrt{2}}$, $\cos\alpha = \frac{1}{\sqrt{2}}$

$\frac{2\sin^2\alpha + 3\cos^2\alpha}{cosec^2\alpha + \cot^2\alpha} = \frac{2\sin^2\alpha + 3\cos^2\alpha}{2cosec^2\alpha - 1}$

$\frac{2\left(\frac{1}{\sqrt{2}}\right)^2 + 3\left(\frac{1}{\sqrt{2}}\right)^2}{2\left(\sqrt{2}\right)^2 - 1} = \frac{1 + \frac{3}{2}}{3} = \frac{5}{6}$

Sol.268.(a) Identity:-

$(sec^2\theta - tan^2\theta) = 1$

$\rightarrow \frac{1}{(\sec\theta - \tan\theta)} =$

$\frac{1}{(\sec\theta - \tan\theta)} \times \frac{(\sec\theta + \tan\theta)}{(\sec\theta + \tan\theta)}$

$= \frac{(\sec\theta + \tan\theta)}{sec^2\theta - tan^2\theta} = (\sec\theta + \tan\theta)$

Sol.269.(c) $\frac{1}{(cosec\theta - cot\theta)}$

$= \frac{1}{(cosec\theta - cot\theta)} \times \frac{cosec\theta + cot\theta}{(cosec\theta + cot\theta)}$

$= \frac{cosec\theta + cot\theta}{cosec^2\theta - cot^2\theta} = \frac{cosec\theta + cot\theta}{1}$

$= \operatorname{cosec}\theta + \cot\theta$

Sol.270.(b) A and B are complementary angle, therefore A + B = 90°

$\Rightarrow \cos A \cos B - \sin A \sin B$

$= \cos A \cos(90° - A) - \sin A \sin(90° - A)$

$\Rightarrow \cos A \sin A - \sin A \cos A = 0$

Sol.271.(d) Formula : $\cos 2a = 1 - 2\sin^2 a$

$\cos 2x = 1 - 2\sin^2 x$

$\cos 2(2x) = 1 - 2\sin^2(2x)$

$\cos 4x = 1 - 2\sin(2x).\sin(2x)$

$\cos 4x = 1 - 2[(2\sin x\cos x) \times (2\sin x\cos x)]$

$\cos 4x = 1 - 8\sin^2 x.\cos^2 x$

Sol.272.(b) Formula used:

$\cos(A + B) = \cos A.\cos B - \sin A.\sin B$

And

$\cos(A - B) = \cos A.\cos B + \sin A.\sin B$

$\Rightarrow \cos(45° + x) + \cos(45° - x)$

$= (\cos 45°.\cos x - \sin 45°.\sin x) + (\cos 45°.\cos x + \sin 45°.\sin x)$

$= 2\cos 45°.\cos x$

$= 2 \times \frac{1}{\sqrt{2}} \times \cos x = \sqrt{2}\cos x$

Sol.273.(c) $\sin x = \frac{5}{13} = \frac{p}{h}$,

$b = \sqrt{13^2 - 5^2} = 12$

So, $\cot x = \frac{b}{p} = \frac{12}{5}$

Sol.274.(d) $\cot^4\theta + \cot^2\theta = 3$

$\Rightarrow \cot^2\theta(\cot^2\theta + 1) = 3$

$\Rightarrow \cot^2\theta \times \operatorname{cosec}^2\theta = 3$

Now,

$\operatorname{cosec}^4\theta - \operatorname{cosec}^2\theta = \operatorname{cosec}^2\theta(\operatorname{cosec}^2\theta - 1)$

$= \operatorname{cosec}^2\theta \times \cot^2\theta = 3$

Sol.275.(d) $2sec^2x - tan^2x = 5$

$\Rightarrow sec^2x + sec^2x - tan^2x = 5$

$\Rightarrow sec^2x + 1 = 5$ (As $sec^2x - tan^2x = 1$)

$\Rightarrow sec^2x = 4 \Rightarrow \sec x = 2 = \sec 60° \Rightarrow x = 60°$

Sol.276.(c) $\tan\alpha = \sqrt{2} - 1$

Then, $\cot\alpha = \frac{1}{\sqrt{2} - 1} = \sqrt{2} + 1$

So, $\tan\alpha - \cot\alpha = \sqrt{2} - 1 - (\sqrt{2} + 1) = -2$

Sol.277.(a) $tan^4\theta + tan^2\theta = 2$

$\Rightarrow tan^2\theta(tan^2\theta + 1) = 2$

$\Rightarrow tan^2\theta \times sec^2\theta = 2$

Now, $\sec^4\theta - \sec^2\theta = sec^2\theta(sec^2\theta - 1)$

$= sec^2\theta tan^2\theta = 2$

Sol.278.(d)

$\sin\theta\cos(90° - \theta) + \cos\theta\sin(90° - \theta)$

$\sin\theta\sin\theta + \cos\theta\cos\theta = sin^2\theta + cos^2\theta = 1$

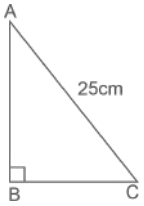
Sol.279.(b) $\sin x + \cos x = \sqrt{2}\sin x$

$\cos x = \sqrt{2}\sin x - \sin x = \sin x(\sqrt{2} - 1)$

$\frac{\sin x}{\cos x} = \frac{1}{\sqrt{2} - 1} = \sqrt{2} + 1$

$\tan x = \sqrt{2} + 1$

Sol.280.(b)



Let BC = 4x , AB= 3x

By pythagoras theorem,

AC = 5x → 25 cm

$\Rightarrow$ x = 5 cm

BC = 20 cm , AB = 15 cm

Given, $tanA = \frac{4}{3} \Rightarrow \frac{BC}{AB} = \frac{20}{15}$

The length of BC = 20 cm

Sol.281.(b) $3\cos^2 x - 2\sin^2 x = -0.75$

$\Rightarrow 3\cos^2 x + 3\sin^2 x - 5\sin^2 x = -0.75$

$\Rightarrow 3(\cos^2 x + \sin^2 x) - 5\sin^2 x = -0.75$

$\Rightarrow 3 - 5\sin^2 x = -\frac{3}{4}$

$\Rightarrow 5\sin^2 x = 3 + \frac{3}{4} \Rightarrow 5\sin^2 x = \frac{15}{4}$

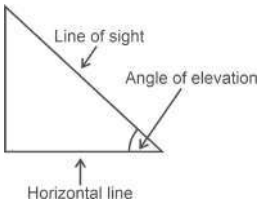
$\Rightarrow \sin^2 x = \frac{3}{4} \Rightarrow sinx = \sqrt{\frac{3}{4}}$

$\Rightarrow sinx = \frac{\sqrt{3}}{2} \Rightarrow x = 60°$

Height and Distance

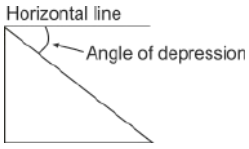
In this chapter following concepts / terminologies will be used.

Angle Of Elevation



The angle made by the line of sight with the horizontal line is called the angle of elevation.

Angle Of Depression



The angle made by the line of sight with the vertical line is called the angle of elevation.

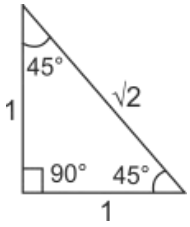
Note: When we come near object, the angle of elevation increases and when we go away from the object, the angle of elevation decreases.

Note: Angle of elevation and angle of depression are always equal.

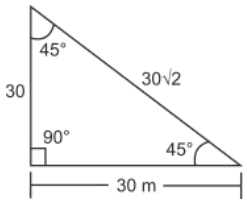
In this chapter trigonometry ratio and concepts will be used which we have discussed in detail in the trigonometry chapter.

Some important relation

Case :- (1)



Example :- the angle of elevation of the top of a tower from a point on the ground, which is 30m away from the foot of the tower is 45°. Find the height of the tower ?



Let the height of the tower be 'H'

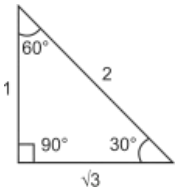
tan 45° = $\frac{H}{30}$

1 = $\frac{H}{30}$ ⇒ H = 30 m

Short Trick :- 1 → 30 m

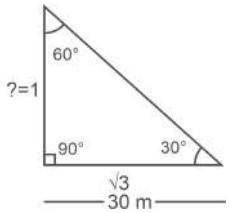
1 → ? ⇒ ? = 30 m

Case :-(2)



Example :- The angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of the tower is 30°. Find the height of the tower ?

Solution :-



Let , the height of the tower be 'H'

tan 30° = $\frac{H}{30}$

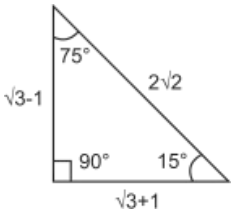
$\frac{1}{\sqrt{3}} = \frac{H}{30}$ ⇒ H = $\frac{30}{\sqrt{3}}$ m = 10 √3 m

Short Trick :-

√3 → 30 m

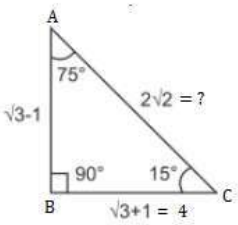
1 → ? ⇒ ? = $\frac{30}{\sqrt{3}}$ m = 10 √3 m

Case :-(3)



Example :- The angle of elevation of a ladder leaning against a wall is 15° and the foot of the ladder is 4 m away from the wall. The length of the ladder is :

Solution :-

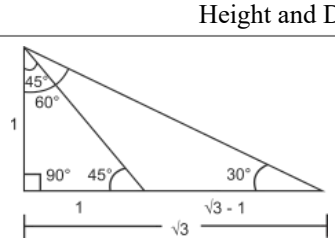


Let AB be the wall and AC be the ladder.
Then, ∠ACB = 15° and BC = 4 m.

√3 + 1 → 4 m

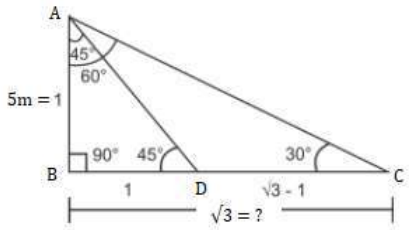
2√2 → ? ⇒ ? = $\frac{8\sqrt{2}}{\sqrt{3}+1}$

Case :-(4)



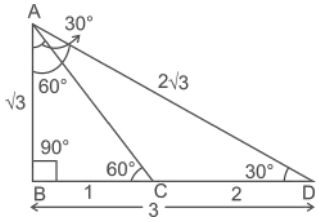
Example :- A man on the top of a vertical observation tower observes a car moving at a uniform speed coming directly towards it and the angle of depression to change from 30° to 45° .if The height of the tower is 5 m then find the value of the total covered distance by the car ?

Solution :-



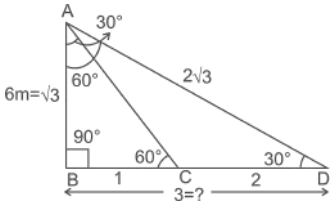
Let AB = Height of tower And
total covered distance by the car (BC) =√3
So , A/Q
1 = 5 m
√3 = ? ⇒ 5√3

Case :- (5)



Example :- A man on the top of a vertical observation tower observes a car moving at a uniform speed coming directly towards it and the angle of depression to change from 30° to 60° . if The height of the tower is 6 m then find the value of the total covered distance by the car ?

Solution :- Let AB = Height of tower = √3
And total covered distance by the car = BD = 3
So , A/Q
√3 = 6 m
3 = ? ⇒ 6√3 m



Variety Questions

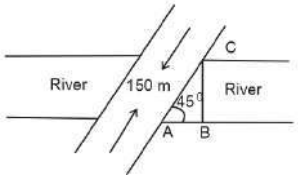
Q.1. A person 1.75 m tall casts a 2 m shadow. At the same instance, a lamp-post casts a shadow of 6.4 m. The height of the lamp-post is:
Group D 28/09/2022 (Morning)
(a) 5.6 m (b) 5.9 m (c) 5.7 m (d) 5.8 m

Q.2. A man on a cliff observes a boat at an angle of depression of 30°, which is approaching the shore to a point exactly beneath the observer, at a uniform speed. Ten minutes later, the angle of depression of the boat is found to be 60°. Find the total time taken by the boat to reach the shore.
NTPC CBT II Level 6 (09/05/2022) Shift 2
(a) 15 minutes (b) 16 minutes
(c) 18 minutes (d) 14 minutes

Q.3. Two poles are on either side of a road. A 20m long ladder is placed between the two poles. When the ladder rests against one pole, It makes an angle of 60° with the pole and when it is turned to rest against the other pole, it makes an angle of 30° with the road. Calculate the width of the road (in m) (use $\sqrt{3}$ =1.732)
NTPC CBT II Level 2 (16/06/2022) Shift 2
(a) 3.464 (b) 0.3264 (c) 32.64 (d) 34.64

Q.4. Two walls of equal height are on either side of a road, which is 100 m wide. At a point on the road two stairs are along the two walls in such a way that they indicate the two angles of elevation from the point 60° and 30°. The length of the larger stair is?
NTPC CBT - I 05/01/2021 (Evening)
(a) 75m (b) $50\sqrt{3}$m (c) $\frac{50\sqrt{3}}{3}$ m (d) 50m

Q.5. A bridge built across a river makes an angle of 45^0 with the river bank as shown in the given figure. If the length of the bridge is 150 m, then what is the width of the river?



NTPC CBT - I 11/01/2021 (Morning)
(a) $63\sqrt{2}$ m (b) $75\sqrt{2}$ m (c) 70 m (d) 65 m

Q.6. A 15m high tree is broken by the wind in such a way that its top touches the ground and makes an angle of 60° with the ground. At what height from the bottom is the tree broken?
NTPC CBT - I 11/01/2021 (Evening)
(a) $\frac{15}{1+\sqrt{3}}$ m (b) $\frac{30\sqrt{3}}{2+\sqrt{3}}$m
(c) 5 m (d) $\frac{15\sqrt{3}}{2+\sqrt{3}}$m

Q.7. An observer 2 m tall is $150\sqrt{3}$m away from a tower. The angle of elevation from his eye to the top of the tower is 60°. The height of the tower is:
NTPC CBT - I 16/01/2021 (Evening)
(a) 452 m (b) 480 m (c) 400 m (d) 450 m

Q.8. A small boy is standing at some distance from a flag post. When he sees the flag, the angle of elevation formed is 60°. If The height of the flag post is 30 feet, What is the distance of the boy from the flag post?
NTPC CBT - I 21/03/2021 (Morning)
(a) $12\sqrt{3}\ ft$ (b) $15\sqrt{3}\ ft$
(c) $20\sqrt{3}\ ft$ (d) $10\sqrt{3}\ ft$

Q.9. Two ships are sailing in the sea on two sides of a lighthouse. The angles of elevation of top of the lighthouse as observed from the two ships are $30^o\ and\ 45^o$ respectively. If the light house is 90 m high, then the distance between the two ships is_____.
NTPC CBT - I 03/04/2021 (Morning)
(a) $90\sqrt{3}\ m$ (b) 90($\sqrt{3}$ + 1) m
(c) 100 m (d) 90 ($\sqrt{3}$ - 1) m

Q.10. The angle of elevation of a hot-air balloon climbing vertically changes from 30° at 10:00 AM to 60° at 10:02 AM as observed from a point 300 m away from the take-off point. What is the upward speed of the balloon?
RRB JE 22/05/2019 (Evening)
(a) 2.18 m/s (b) 2 m/s
(c) 3.4 m/s (d) 2.9 m/s

Practice Questions

RRC Group D
(17/08/2022 to 11/10/2022)

Q.11. A shadow of a tower standing on a level ground is found to be $40\sqrt{3}$ meters longer when the Sun's altitude is 30° when it is 60°. The height of the tower is:
Group D 18/08/2022 (Evening)
(a) 70 m (b) 60 m (c) 40 m (d) 50 m

RRB NTPC CBT - 2
(09/05/2022 to 17/06/2022)

Q.12. From the top of the tower of 30 m height, a man is observing a kid playing on the ground at an angle of depression of 30 degrees. Find the distance between the foot of the tower and the kid. (height of man and kid are to be ignored for calculation)
Level 6 (09/05/2022) Shift 2
(a) 53 m (b) $\frac{30}{\sqrt{3}}m$ (c) $52\sqrt{3}m$ (d) $30\sqrt{3}m$

Q.13. A man on the top of a vertical tower observes a car moving at a uniform speed coming directly towards it. If it takes 10 minutes for the angle of depression to change from 45° to 60° ,in how much time will the car reach the tower?
Level 5 (15/06/2022) Shift 2
(a) (15 + $5\sqrt{3}$) minutes
(b) (3 + $5\sqrt{3}$) minutes
(c) (15 + $8\sqrt{3}$) minutes
(d) (15 + $3\sqrt{3}$) minutes

Q.14. The angle of elevation of an aeroplane from a point on the ground is 45°. After a flight of 12 seconds horizontally, the angle of elevation changes to 30°. If the aeroplane is flying at height of 2400 m, Find the speed of the aeroplane (in km/h).
Level 5 (15/06/2022) Shift 3
(a) 72(1+$\sqrt{3}$) (b) 720($\sqrt{3}$ + 1)
(c) 720($\sqrt{3}$ − 1) (d) 72($\sqrt{3}$ − 1)

RRB NTPC CBT - 1
(28/12/2020 to 31/07/2021)

Q.15. The horizontal distance between two towers is $40\sqrt{3}$m. The angle of depression of the top of the first tower when seen from the top of the second tower is 30^0. If the height of the second tower is 130 m. Find the height of the first tower.
RRB NTPC 30/12/2020 (Evening)
(a) 80 m (b) 95 m (c) 85 m (d) 90 m

Q.16. The angle of elevation of a pole from a point, which is 20 m away from the foot of the pole is 45°. Find the height of the pole.
RRB NTPC 04/01/2021 (Morning)
(a) 20 $\sqrt{2}$m (b) 10 m (c) 20 m (d) 15 m

Q.17. When the shadow of a pole of 10 m height is $10\sqrt{3}$ m , the angular elevation of the sun is.
RRB NTPC 07/01/2021 (Morning)
(a) 30° (b) 60° (c) 90° (d) 75°

Q.18. Two poles of height 20 and 14 meters are joined at the top by a wire

which makes an angle of 30° with the horizontal. The length of the wire is?
RRB NTPC 08/01/2021 (Morning)
(a) 12 m (b) 10 m (c) 16 m (d) 14 m

Q.19. A man standing on the banks of a river observes that the angle subtended by a tree on the opposite bank is 60°. He walks 36 meters backward on the bank and observes the angle to be 30°. What is the breadth of the river?
RRB NTPC 08/01/2021 (Morning)
(a) 10 meters (b) 18 Meters
(c) 20 Meters (d) 28 meters

Q.20. The top of two towers of heights x and y standing on level ground, subtend angles of 60° and 30°respectively at the midpoint of the line joining their feet. The value of x : y is
RRB NTPC 09/01/2021 (Morning)
(a) 2 : 1 (b) 1 : 2 (c) 1 : 3 (d) 3 : 1

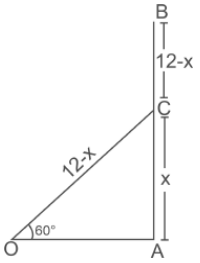
Q.21. The angles of elevation of the top of a tower from two points on the ground 18 m and 32 m away from the foot of the tower are complementary. The height of the tower is.
RRB NTPC 09/01/2021 (Evening)
(a) 20 m (b) 36 m (c) 24 m (d) 32 m

Q.22. 5 m long ladder is leaning against a wall and it reaches the wall at a point 3 m high. By how much distance the ladder should be moved towards the wall so that its top reaches a point 4.8 m high.
RRB NTPC 10/01/2021 (Morning)
(a) 1.4 m (b) 2.6 m (c) 2.96 m (d) 2.2 m

Q.23. A window in a building is at a height of 10 m from the ground. The angle of depression at a point P on the ground from the window is 30°. The angle of elevation of the top of the building from the point P is 60°. What is the height of Building?
RRB NTPC 10/01/2021 (Evening)
(a) 30 m (b) 40 m (c) 35 m (d) 20 m

Q.24. A 10 feet long ladder leaning against a wall, reaches the wall at a point 8 feet high. By how much distance should the ladder be moved towards the wall so that its top reaches a point at 9.6 feet high?
RRB NTPC 11/01/2021 (Evening)
(a) 2.8 ft (b) 3.2 ft (c) 4.4 ft (d) 3.92ft

Q.25. A tree, 12 m in height, is broken by the wind in such a way that its top touches the ground and makes an angle of 60° with the ground. At what height from the bottom is the tree broken by the wind?



RRB NTPC 13/01/2021 (Evening)
(a) $(24\sqrt{2} - 30)$m (b) $(24\sqrt{3} - 36)$m
(c) $(2\sqrt{3} - 3)$m (d) $24\sqrt{3}$ m

Q.26. An observer 1.5 m tall is standing 28.5 m away at the same level as the foot of a tower. If angle of elevation of the observer watching the top of the tower is 45 degrees then what is the height of the tower?
RRB NTPC 16/01/2021 (Morning)
(a) 30 m (b) 25 m (c) 35 m (d) 20 m

Q.27. Two ships are sailing in the sea on the two sides of a lighthouse. The angles of elevation of the top of the lighthouse as observed from the ships are 45° and 60° respectively. If the lighthouse is 81 m high then the distance between two ships is:
RRB NTPC 16/01/2021 (Evening)
(a) $\frac{(1+\sqrt{3})}{81\sqrt{3}}m$ (b) $\frac{(1+\sqrt{3})}{\sqrt{3}}m$
(c) $\frac{[81(1+\sqrt{3})]}{\sqrt{3}}m$ (d) $\frac{81}{\sqrt{3}}m$

Q.28. The angle of elevation of the sun when the length of the shadow of a pole is equal to its height is.
RRB NTPC 17/01/2021 (Evening)
(a) 30° (b) 60° (c) 90° (d) 45°

Q.29. Two poles are standing on the ground. The distances between their feet and their tops are 48m and 50 m respectively. If the height of the small pole is 10 m. Find the height of the big pole.
RRB NTPC 25/01/2021 (Morning)
(a) 12m (b) 14 m (c) 16 m (d) 24 m

Q.30. The top of a tower makes complementary angles of elevation from two points at the distances of 25 m and 16 m from its foot on the ground. Find the height of the tower.
RRB NTPC 25/01/2021 (Morning)
(a) 25 m (b) 18 m (c) 20 m (d) 17 m

Q.31. An electric pole casts a shadow of length 28 m at a time when a nearby tree 8 m high casts a shadow of length 14 m. Find the height of the pole.
RRB NTPC 27/01/2021 (Evening)
(a) 16 m (b) 14 m (c) 20 m (d) 15 m

Q.32. The angles of depression of two houses of the same height from the top of a building are 45° and 30° towards the east. If the two houses are 50 m apart, what will be the height of the building in meters?
RRB NTPC 29/01/2021 (Morning)
(a) 50 $(\sqrt{3} + 1)$ (b) 25 $(\sqrt{3} + 1)$
(c) 45 $(\sqrt{3} - 1)$ (d) 35$(\sqrt{3} - 1)$

Q.33. A kite is flying with a thread of length 296 m, making an angle of elevation measuring 30° at a point of the hand of a person of height 2m from the ground. Find the height of the kite from the ground.
RRB NTPC 30/01/2021 (Morning)
(a) 250 m (b) 150 m (c) 200 m (d) 300 m

Q.34. From a point Y on the level ground, the angle of elevation of the top of a lamp post is 45°. If the distance of point Y from the foot of the lamp post is 80 m, the height of the lamp post will be:
RRB NTPC 31/01/2021 (Evening)
(a) 70 m (b) 80 m (c) 82 m (d) 78 m

Q.35. The angle of elevation of a lamp post changes from $30°$ to $60°$ when a person walks 30 m towards it. Find the height of the lamp post.
RRB NTPC 01/02/2021 (Evening)
(a) $\sqrt{3}$ m (b) $5\sqrt{3}$ m (c) $15\sqrt{3}$ m (d) $3\sqrt{3}$ m

Q.36. Find the angle of elevation of a 200 $\sqrt{3}$ m tower's top from a point 200 m away from its base.
RRB NTPC 03/02/2021 (Evening)
(a) 90° (b) 45° (c) 30° (d) 60°

Q.37. An observer 1.5 m tall is 24.5 m away from a 26 m high tower. The angle of elevation of the top of the tower from the eye of the observer is:
RRB NTPC 03/03/2021 (Evening)
(a) 60° (b) 30° (c) 45° (d) 75°

Q.38. If the height of a pole is $6\sqrt{3}$ metre and the length of its shadow is 6 metre, then the angle of elevation of the sun is:
RRB NTPC 07/03/2021 (Evening)
(a) 60° (b) 45° (c) 30° (d) 0°

Q.39. A pole consists of a steel portion, and a wooden portion on top of the steel portion. Point A on the ground, is 100 m away from the base of the pole. The angle of elevation from point A to the top S of the wooden portion of the pole, is 60°. The angle of elevation, from A to the top R of the steel portion of the pole, is 45°. What is the height of the wooden

portion of the pole? (Take $\sqrt{3}$ = 1.732)
RRB NTPC 11/03/2021 (Evening)
(a) 98.2 m (b) 141.2 m
(c) 73.2 m (d) 114.2 m

Q.40. If the length of a pole is $6\sqrt{3}$ m and the length of the shadow is 6 m, then the angle of elevation of the sun is:
RRB NTPC 13/03/2021 (Evening)
(a) 0° (b) 60° (c) 30° (d) 45°

Q.41. A man standing at a point 'P' is watching the top of a tower, marked by the point 'S'. He walks a distance of $40\sqrt{3}$ m towards the foot of the tower to point 'Q'. From 'Q' the angle of elevation of 'S' is 60°. Find the angle of elevation of 'S' from 'P',if the height of the tower is 60 m.
RRB NTPC 14/03/2021 (Evening)
(a) 60° (b) 30° (c) 75° (d) 45°

Q.42. A tower is $200\sqrt{3}$m high. Find the angle of elevation of its top from a point 200 m away from its foot.
RRB NTPC 21/03/2021 (Morning)
(a) 90° (b) 60° (c) 30° (d) 45°

Q.43. The length of the string between a kite and a point on the ground, without any slack, is 102 m.If the string makes an angle α with the level ground such that $\tan\alpha = \frac{15}{8}$, How high is the kite?
RRB NTPC 21/03/2021 (Evening)
(a) 105 m (b) 90 m (c) 100 m (d) 80 m

Q.44. The height of a house is h and 5.2 m long ladder is just sufficient to go at the top of the house when its inclination with the horizontal ground is 45^o. Find the height of the house.
RRB NTPC 27/03/2021 (Morning)
(a) 14 m (b) 10.4 m (c) $\frac{13\sqrt{2}}{5}$m (d) 13 m

Q.45. 300 m from the foot of a cliff on a level ground, the angle of elevation of the top of a cliff is 60°. Find the height of the cliff.
RRB NTPC 03/04/2021 (Evening)
(a) $200\sqrt{3}$m (b) $150\sqrt{3}$m
(c) $300\sqrt{3}$m (d) $250\sqrt{3}$m

Q.46. The ratio of the length of a tree to its shadow is 1 : $\frac{1}{\sqrt{3}}$. The angle of the sun's elevation is:
RRB NTPC 07/04/2021 (Evening)
(a) 75° (b) 30° (c) 60° (d) 45°

Q.47. From the top and bottom of 200 m high building, the angles of elevation of the top of a tower are 30° and 45° respectively. What is the height (in m) of the tower?
RRB NTPC 08/04/2021 (Evening)
(a) $100(\sqrt{3}+1)$ (b) $300(\sqrt{3}+1)$
(c) $100\sqrt{3}(\sqrt{3}+1)$ (d) $100\sqrt{3}(\sqrt{3}-1)$

Q.48. A man standing at point P is watching the top of a tower S, which makes an angle of elevation of 30° with the man's eye. The man walks a distance of 20 m towards the tower to watch its top and the angle of the elevation becomes 45°. What is the distance between the base of the tower and the point P (take$\sqrt{3}$ = 1.732)?
RRB NTPC 31/07/2021 (Evening)
(a) 47.32 m (b) 22.7 m
(c) 14.64 m (d) 27.32 m

RRB JE (22/05/2019 to 28/06/2019)

Q.49. Two vertical lamp-posts of equal height are on either side of a road 50 m wide. At a point on the road between the lamp-posts, the elevations of the tops of lamp-posts are 60° and 30°. Find the height of the lamp-post.
RRB JE 27/05/2019 (Evening)
(a) 22.50 m (b) 23.75 m
(c) 18.65 m (d) 21.65 m

Q.50. A balloon is flying at a height of 200 m. A person sitting in a boat in a lake observes it at an angle of elevation of 45°. After 100 seconds, he observes it at an angle of elevation of 30°. Find out the speed of the boat?
RRB JE 28/05/2019 (Afternoon)
(a) 1.8m/s (b) 2.2 m/s
(c) 1.5m/s (d) 2 m/s

Q.51. The angle of elevation of the top of a chimney from the top of a tower is 60° and the angle of depression of the foot of the chimney from the top of the tower is 30°. If the height of the tower is 40 m, then find the height of the chimney.
RRB JE 02/06/2019 (Evening)
(a) 160 m (b) 175 m (c) 192 m (d) 220 m

RRB ALP Tier - 2 (21/01/2019 to 08/02/2019)

Q.52. A ladder is placed against a wall in such a way that its base is at a distance of 5 m from the wall and its top touches a window at a height of 12 m from the ground. What will be the length of the ladder?
ALP Tier II 21/01/2019 (Afternoon)
(a) 16m (b) 15m (c) 24m (d) 13m

Q.53. When the length of the shadow of a tree is $\sqrt{3}$ times the height of the tree, then what will be the angle of elevation of the sun?
ALP Tier II 21/01/2019 (Afternoon)
(a) 30° (b) 60° (c) 75° (d) 45°

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.54. From the top of a platform 5m high, the angle of elevation of a tower was 30°. If the platform was positioned $40\sqrt{3}$ m away from the tower, how tall was the tower?
RRB ALP 13/08/2018 (Afternoon)
(a) 40 m (b) $30\sqrt{3}$ m
(c) $20\sqrt{3}$ m (d) 45 m

Q.55. From the top of a platform, the angle of elevation of a tower was 30°. The tower was 45 m high and the horizontal distance between the platform and the tower was $40\sqrt{3}$ m. What was the height of the platform? (in meters)
RRB ALP 14/08/2018 (Afternoon)
(a) $45\sqrt{3}$ (b) 40 (c) 5 (d) $20\sqrt{3}$

Q.56. From the top of a building, the angles of elevation and depression of top and bottom of a tower are 60°and 30° respectively. If the height of the building is 5 m, then the height of the tower is (in meters) :
RRB ALP 14/08/2018 (Evening)
(a) 10√3 (b) 20 (c) 5√3 (d) 15

Q.57. The angle of elevation of the top of a 36 m tall tower from the initial position of a person on the ground was 60°. She walked away in a manner that the foot of the tower, her initial position and the final position were all in the same straight line. The angle of elevation of the top of the tower from her final position was 30°. How much did she walk from her initial position? (in meters)
RRB ALP 21/08/2018 (Afternoon)
(a) 24 (b) $12\sqrt{3}$ (c) $36\sqrt{3}$ (d) $24\sqrt{3}$

Answer key :-

1.(a)	2.(a)	3.(d)	4.(b)
5.(b)	6.(d)	7.(a)	8.(d)
9.(b)	10.(d)	11.(b)	12.(d)
13.(a)	14.(c)	15.(d)	16.(c)

17.(a)	18.(a)	19.(b)	20.(d)
21.(c)	22.(b)	23.(a)	24.(b)
25.(b)	26.(a)	27.(c)	28.(d)
29.(d)	30.(c)	31.(a)	32.(b)
33.(b)	34.(b)	35.(c)	36.(d)
37.(c)	38.(a)	39.(c)	40.(b)
41.(b)	42.(b)	43.(b)	44.(c)
45.(c)	46.(c)	47.(c)	48.(a)
49.(d)	50.(c)	51.(a)	52.(d)
53.(a)	54.(d)	55.(c)	56.(b)
57.(d)			

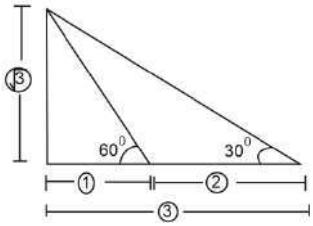
Solutions:-

Sol.1.(a) Shadows will be directly proportional to the height of the object .
Shadow ∝ height of the object
Shadow = k × height of the object (where k is constant)
According to question ,

1.75 = k × 2 ⇒ k = $\frac{7}{8}$

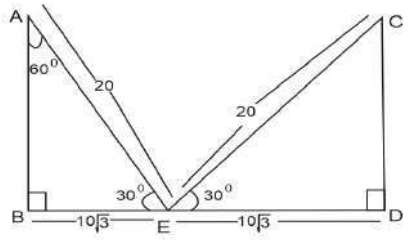
∴ Height of lamp – post = $\frac{7}{8}$ × 6.4 = 5.6 m

Sol.2.(a)



To cover 2 unit distance boat takes 10 min.
To cover 1 unit distance boat will take 5 min.
So , Total time taken to reach shore
= 10 min. + 5 min. = 15 min.

Sol.3.(d)



In triangle ABE, sin 30°= $\frac{AB}{AE} \Rightarrow \frac{1}{2} = \frac{AB}{20}$

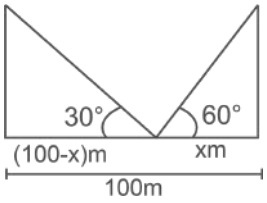
$\Rightarrow AB = 10 \; and \; BE = 10\sqrt{3}$

In triangle CDE, sin 30°= $\frac{CD}{CE} \Rightarrow \frac{1}{2} = \frac{CE}{20}$

$\Rightarrow CD = 10 \; and \; DE = 10\sqrt{3}$

So,width of the road
BD = BE + DE= $10\sqrt{3}+10\sqrt{3}$
= $20\sqrt{3} = 20 \times 1.732$ =34.64 m

Sol.4.(b) Let the height of the wall = h



tan 60° = $\frac{h}{x}$

$\sqrt{3} = \frac{h}{x}$ ⇒ h = $\sqrt{3}$x ----(1)

Also, tan 30° = $\frac{h}{100-x}$

$\frac{1}{\sqrt{3}} = \frac{h}{100-x} \Rightarrow h = \frac{100-x}{\sqrt{3}}$ ----- (2)

From (1) and (2),

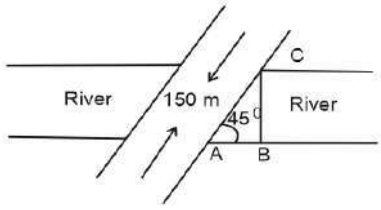
$\sqrt{3}x = \frac{100-x}{\sqrt{3}}$

3x = 100 - x ⇒ 4x = 100 ⇒ x = 25 m

From (1), h = $25\sqrt{3}$

Length of larger stair = $\sqrt{75^2 + (25\sqrt{3})^2}$
= $\sqrt{5625 + 1875} = \sqrt{7500} = 50\sqrt{3}$ m

Sol.5.(b)



In ΔABC,

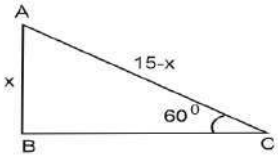
tan 45°= $\frac{BC}{AB}$ = 1 ⇒ AB = BC

$BC^2 + AB^2 = AC^2$

⇒ 2 BC^2 = 150 × 150

⇒ $\sqrt{2}$ BC = 150 ⇒ BC = $75\sqrt{2}$ m

Sol.6.(d)



In ΔABC,

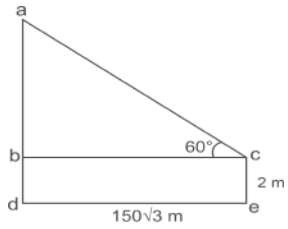
Sin 60° = $\frac{x}{15-x}$

⇒ $\frac{\sqrt{3}}{2} = \frac{x}{15-x} \Rightarrow 2x = 15\sqrt{3} - \sqrt{3}x$

⇒ $2x + \sqrt{3}x = 15\sqrt{3}$

⇒ $x(2 + \sqrt{3}) = 15\sqrt{3} \Rightarrow x = \frac{15\sqrt{3}}{2+\sqrt{3}}$m

Sol.7.(a)

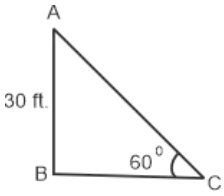


In this que. bd = ce = 2m ,
bc = de = $150\sqrt{3}$

Then Δ abc tan60° = $\frac{ab}{bc} \Rightarrow ab = 450$

Then total length of tower
= 450 + 2 = 452 m

Sol.8.(d)

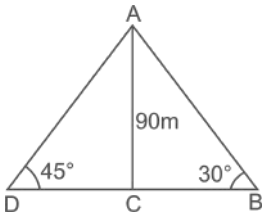


tanθ = $\frac{P}{B} = \frac{AB}{BC} \Rightarrow \tan 60° = \frac{30}{BC}$

$\sqrt{3} = \frac{30}{BC} \Rightarrow BC\sqrt{3} = 30$

BC = $\frac{30}{\sqrt{3}} = 10\sqrt{3} \; ft$

Sol.9.(b)



In ΔADC,

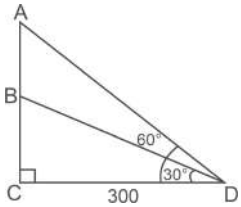
tan 45° = $\frac{90}{DC}$ = 1

⇒ DC = 90 m In ΔABC,

tan 30° = $\frac{90}{BC} = \frac{1}{\sqrt{3}} \Rightarrow$ BC = $90\sqrt{3}$ m

Distance between two ships
= $90 + 90\sqrt{3} \Rightarrow 90(1 + \sqrt{3})$ m

Sol.10.(d)



In ΔBCD,

tan 30° = $\frac{BC}{CD}$

$\Rightarrow \frac{1}{\sqrt{3}} = \frac{BC}{300} \Rightarrow BC = \frac{300}{\sqrt{3}} \; m$

In ΔACD, tan 60° = $\frac{AC}{CD}$

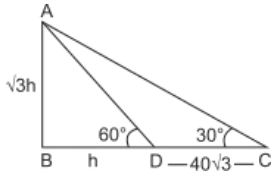
$\Rightarrow \sqrt{3} = \frac{AC}{300} \Rightarrow AC = 300\sqrt{3}$ m

Now, increased distance
= $300\sqrt{3} - \frac{300}{\sqrt{3}} = 200\sqrt{3}$ m

So, the upward speed of the balloon

$= \frac{200\sqrt{3}}{2 \times 60} = \frac{5}{\sqrt{3}}$ = 2.9 m/s

Sol.11.(b)



In triangle ABD,

tan 60° = $\frac{AB}{BD} \Rightarrow AB = \sqrt{3}h$

In triangle ABC,

tan 30° = $\frac{AB}{BD + CD} \Rightarrow AB = \frac{h + 40\sqrt{3}}{\sqrt{3}}$

Now, $\sqrt{3}h = \frac{h + 40\sqrt{3}}{\sqrt{3}}$

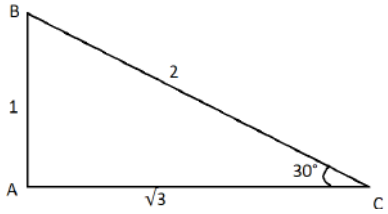
$\Rightarrow 3h = h + 40\sqrt{3} \Rightarrow 3h - h = 40\sqrt{3}$

$\Rightarrow 2h = 40\sqrt{3} \Rightarrow h = 20\sqrt{3}$

Now, height of the tower (AB)

$= \sqrt{3}h = \sqrt{3} \times 20\sqrt{3} = 20 \times 3 = 60\ m$

Sol.12.(d) Let B be the position of the man and C be the position of child.

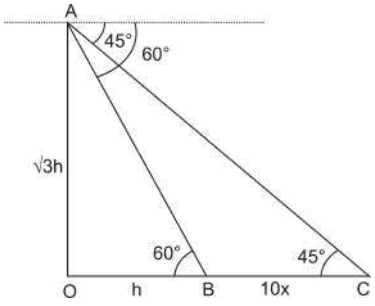


ATQ, 1 unit = 30 metres.

Distance between the foot of the man and the child = AC = $\sqrt{3}$ units.

$\sqrt{3}$ units = $30\sqrt{3}$ metres.

Sol.13.(a)



Let the speed of car be x m/min

BC = $x \times 10$

Let OB = h

In ΔAOB, tan60° = $\frac{AO}{OB} \Rightarrow \sqrt{3} = \frac{AO}{h}$

$\Rightarrow AO = h\sqrt{3}$

In ΔAOC , tan45° = $\frac{AO}{OC}$

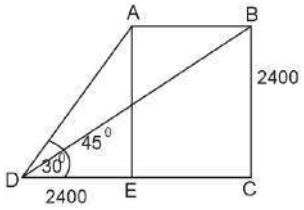
$\Rightarrow \sqrt{3}h = h + 10x \Rightarrow x = \frac{h(\sqrt{3} - 1)}{10}$

Now, Time taken by car to reach the tower = $10 + \frac{OB}{x} = 10 + \frac{h \times 10}{h(\sqrt{3} - 1)}$

$= 10 + \frac{10}{\sqrt{3} - 1} \times \frac{\sqrt{3} + 1}{\sqrt{3} + 1}$

$= 10 + 5(\sqrt{3} + 1) = (15 + 5\sqrt{3})\ min.$

Sol.14.(c)



tan 45° = $\frac{AE}{DE} = \frac{2400}{DE} \Rightarrow DE = 2400\ m$

Now, tan 30°= $\frac{BC}{DE + EC}$

$\Rightarrow \frac{2400}{2400 + EC} = \frac{1}{\sqrt{3}}$

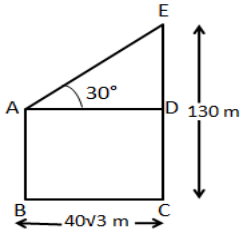
EC = $2400(\sqrt{3} - 1)$

Speed of the aeroplane

$= \frac{2400\ (\sqrt{3} - 1)}{12} \times \frac{18}{5}$

$= 720\ (\sqrt{3} - 1)$ km/h

Sol.15.(d)



From the above diagram,

$\frac{ED}{AD} = tan30^{\circ}$

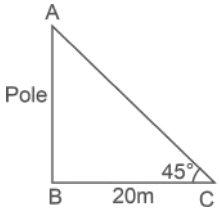
Let the height of the first tower = h

$\Rightarrow \frac{ED}{AD} = \frac{1}{\sqrt{3}} \Rightarrow \frac{130 - h}{40\sqrt{3}} = \frac{1}{\sqrt{3}}$

$\Rightarrow$ h = 90

So, the height of the first tower is 90 m.

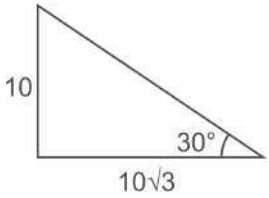
Sol.16.(c)



From the figure, tan 45° = $\frac{height\ of\ the\ pole}{distance\ between\ foot\ of\ pole\ and\ point}$

1 = $\frac{h}{20} \Rightarrow$ h = 20 m.

Sol.17.(a)



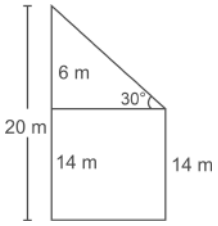
Here, the shadow of a pole of 10 m height is $10\sqrt{3}$ m

$\Rightarrow tan\ \theta = \frac{10}{10\sqrt{3}} \Rightarrow tan\ \theta = \frac{1}{\sqrt{3}}$

$\Rightarrow \theta = 30°$

So, the angular elevation of the sun is $30°$

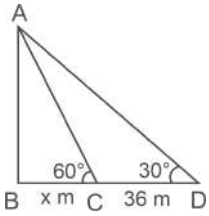
Sol.18.(a) L :- Length of wire



Sin 30° = $\frac{6}{L} \Rightarrow \frac{1}{2} = \frac{6}{L}$

$\Rightarrow$ L = 6 × 2 = 12 m

Sol.19.(b)



In Δ ABC,

tan 60° = $\frac{AB}{x} \Rightarrow \sqrt{3} = \frac{AB}{x} \Rightarrow$ AB = $\sqrt{3}$x ----(1)

In Δ ABD,

tan 30° = $\frac{AB}{x + 36}$

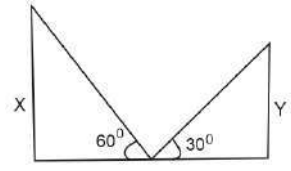
$\Rightarrow \frac{1}{\sqrt{3}} = \frac{AB}{x + 36} \Rightarrow$ AB = $\frac{x + 36}{\sqrt{3}}$ ----(2)

From equation (1) and (2),

$\sqrt{3}x = \frac{x + 36}{\sqrt{3}} \Rightarrow 3x = x + 36$

$\Rightarrow$ x = 18 m (breadth of the river)

Sol.20.(d)



Let distance from mid point to their feet = b

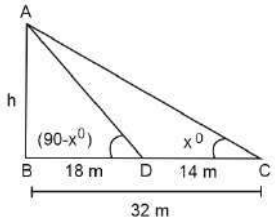
From the above diagram, we can see

$\frac{x}{b}$ = tan60°, $\frac{y}{b}$ = tan30°

The ratio of x : y = b × $tan60^{o}$: b × $tan30^{o}$

= 3 : 1

Sol.21.(c)



In ΔABC, tanx° = $\frac{h}{32}$ -----(1)

In ΔABD,

tan(90 - x)° = $\frac{h}{18}$

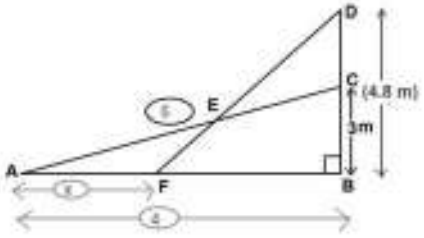
⇒ cotx° = $\frac{h}{18}$ ⇒ tanx° = $\frac{18}{h}$--------(2)

From equation (1) and (2)

$\frac{h}{32} = \frac{18}{h}$

⇒ h^2 = 32 × 18 = 576 ⇒ h = 24 m

Sol.22.(b)



5 m long ladder is leaning against a wall and it reaches the wall at a point 3 m high.

Let the distance by which the ladder should be moved towards the wall so that its top reaches a point 4.8 m high = x ;

According to the question :

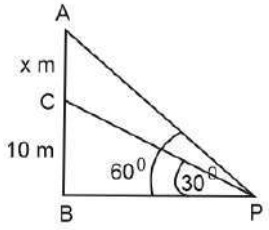
⇒ $(4 - x)^2 + (4.8)^2 = 5^2$

⇒ $(4 - x)^2 = 5^2 - (4.8)^2$

⇒ $(4 - x) = \sqrt{5^2 - (4.8)^2}$

⇒ $(4 - x) = 1.4 \Rightarrow x = 2.6$m

Sol.23.(a)



In ΔBCP, tan30° = $\frac{10}{BP}$

⇒ $\frac{1}{\sqrt{3}} = \frac{10}{BP}$ ⇒ BP = $10\sqrt{3}$

In ΔABP

tan 60° = $\frac{10 + x}{10\sqrt{3}}$

⇒ $\sqrt{3} = \frac{10 + x}{10\sqrt{3}}$ ⇒ x = 30 - 10 = 20 m

Height of building = 10 + 20 = 30 m

Alternate Method:

Angle → 30 : 60 : 90

Ratio → 1 : $\sqrt{3}$: 2

So, In ΔBCP,

1 unit = 10m

⇒ $\sqrt{3}$ unit = $10\sqrt{3}$ m

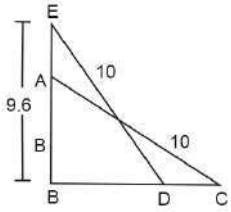
In ΔABP,

1 unit = $10\sqrt{3}$ m

⇒$\sqrt{3}$ unit = 10 × $\sqrt{3}$ × $\sqrt{3}$ = 30m

So, Height AB = 30m

Sol.24.(b)



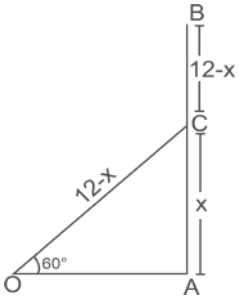
In ΔABC, BC = $\sqrt{10^2 - 8^2}$ = 6 feet

In ΔEBD, BD = $\sqrt{10^2 - (9.6)^2}$

= $\sqrt{100 - 92.16}$ = $\sqrt{7.84}$ = 2.8 feet

DC = BC - BD = 6 - 2.8 = 3.2 feet

Sol.25.(b)



From the given diagram we can write

$\frac{x}{12 - x} = sin\ 60° \Rightarrow \frac{x}{12 - x} = \frac{\sqrt{3}}{2}$

⇒ $x = \frac{12\sqrt{3}}{2 + \sqrt{3}}$

⇒ $x = 12\sqrt{3} \times (2 - \sqrt{3}) = (24\sqrt{3} - 36)$

So, At the height from the bottom where the tree is broken by the wind is

$(24\sqrt{3}$ - 36)m.

Alternate Method:

Angle → 30 : 60 : 90

Ratio → 1 : $\sqrt{3}$: 2

Now, in triangle OAC,

$\sqrt{3}$ unit = x

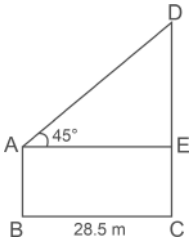
So, 2 unit = $\frac{2x}{\sqrt{3}}$

Now, C = 12 - $x \Rightarrow x = \frac{12\sqrt{3}}{2 + \sqrt{3}}$

On rationalisation, we get,

$x = \frac{12\sqrt{3}\,(2 - \sqrt{3})}{2 + \sqrt{3(2 - \sqrt{3})}}$ = (24$\sqrt{3}$ - 36)m

Sol.26.(a)

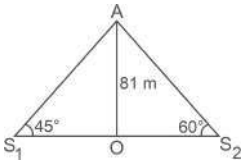


In ΔADE, tan 45° = $\frac{DE}{28.5}$

⇒ 1 = $\frac{DE}{28.5}$ ⇒ DE = 28.5 m

Height of tower = 28.5 + 1.5 = 30 m

Sol.27.(c)



S_1 and S_2 are the two ships and S_1S_2 is the distance between them.

So that in ΔAS_1O ,

AO = 81 = S_1O = 81

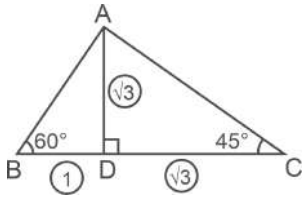
In ΔAS_2O

tan60 = $\frac{81}{OS_2} \Rightarrow OS_2 = \frac{81}{\sqrt{3}}$

Then distance between two ships

= 81+ $\frac{81}{\sqrt{3}} = \frac{[81(1 + \sqrt{3})]}{\sqrt{3}} m$

Short Tricks:-



Here ,

Ratio of side with respect to angle :-

30° : 60° : 90° = 1 : $\sqrt{3}$: 2

45° : 45° : 90° = 1 : 1 : $\sqrt{2}$

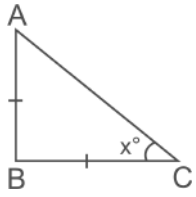
According to question ,

$\sqrt{3}$ unit = 81 m

Then ,

$(\sqrt{3} + 1)$ unit = $\frac{81}{\sqrt{3}} \times (\sqrt{3} + 1)$ m

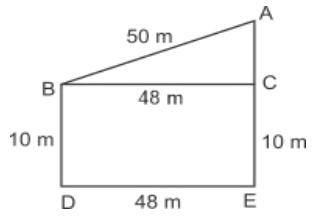
Sol.28.(d)



tanx° = $\frac{AB}{BC} = \frac{AB}{AB}$ = 1

⇒ tanx° = tan 45° ⇒ x° = 45°

Sol.29.(d)



Given

AB = 50 m , BC = 48 m and BD = 10 m

A/Q

Applying pythagoras theorem in triangle ABC

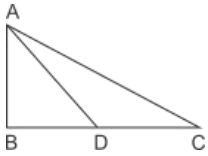
⇒ $AB^2 = BC^2 + AC^2$

⇒ AC = 14 m

So , total length of big pole = AC + CE

= 14 + 10 = 24 m

Sol.30.(c)



Given, BC = 25m and BD=16 m

A/Q

ADB and ∠ ACB are complementary.

In ΔABD

$\tan\theta = \frac{AB}{BD} \Rightarrow \tan\theta = \frac{AB}{16}$ -------- (i)

InΔ ABD

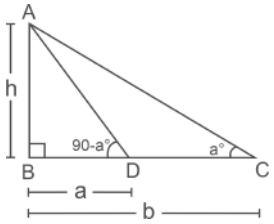
$\tan(90° - \theta) = \frac{AB}{BC} = \cot\theta = \frac{AB}{BC}$

$\Rightarrow \tan\theta = \frac{BC}{AB}$ --------- (ii)

From equation i and ii

AB = 20 m

Short Tricks :-



Height of tower (h) = $\sqrt{ab} = \sqrt{25 \times 16}$

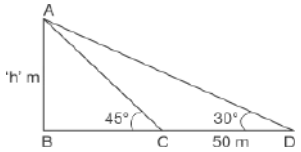
= 20 cm

Sol.31.(a) The ratio of height and shadow for both the electric pole and tree should be the same.

$$\frac{Height\ of\ Pole}{Length\ of\ shadow\ of\ pole} = \frac{Height\ of\ tree}{Length\ of\ shadow\ of\ tree}$$

$\Rightarrow \frac{h}{28} = \frac{8}{14} \Rightarrow h = \frac{8 \times 28}{14} = 16\ m$

Sol.32.(b)



In ΔABC

$\tan 45° = \frac{h}{BC} \Rightarrow 1 = \frac{h}{BC} \Rightarrow BC = h$

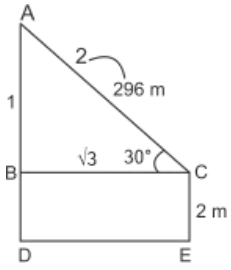
In ΔABD

$\tan 30° = \frac{h}{h+50} \Rightarrow \frac{1}{\sqrt{3}} = \frac{h}{h+50}$

$\Rightarrow \sqrt{3}h = h + 50 \Rightarrow (\sqrt{3} - 1)h = 50$

$\Rightarrow h = \frac{50}{(\sqrt{3}-1)} = 25(\sqrt{3}+1)\ m$

Sol.33.(b)



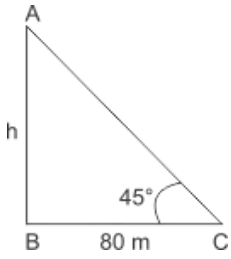
2 unit = 296

AB = 1 unit = $\frac{296}{2} = 148$

Height of kite from the ground = 148 + 2

= 150 m

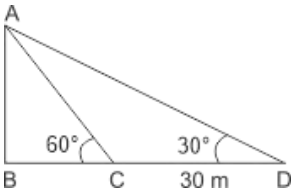
Sol.34.(b)



In ΔABC $\tan 45° = \frac{h}{80}$

$\Rightarrow 1 = \frac{h}{80} \Rightarrow h = 80\ m$

Sol.35.(c)



Height of the lamp post = AB

In ΔABC, $\tan 60° = \frac{AB}{BC}$

$\Rightarrow \sqrt{3} = \frac{AB}{BC} \Rightarrow AB = \sqrt{3}BC$

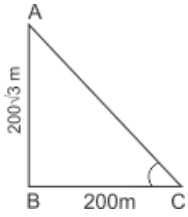
In ΔABD, $\tan 30° = \frac{AB}{BC + 30}$

$\Rightarrow \frac{1}{\sqrt{3}} = \frac{\sqrt{3}BC}{BC+30}$

⇒ BC + 30 = 3 BC ⇒ $BC = 15\ m$

AB = $15\sqrt{3}m$

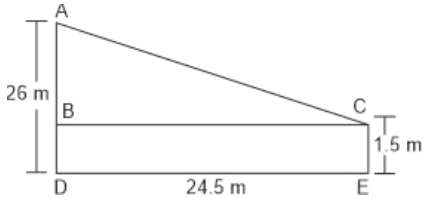
Sol.36.(d)



$\tan c = \frac{200\sqrt{3}}{200} = \sqrt{3} = tan\ 60°$

⇒ ∠c = 60°

Sol.37.(c)



Given , AD = 26m, BC = 24.5 m, CE = 1.5 m

In triangle ABC

AB = 24.5 m , BC = 24. 5 m

$\tan\theta = \frac{p}{b} = \frac{24.5}{24.5}$

⇒ tanθ = 1 ⇒ tanθ = tan 45° ⇒ θ = 45°

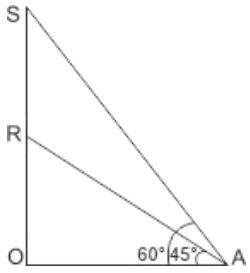
Sol.38.(a) As the height of a pole is $6\sqrt{3}$ metre and the length of its shadow is 6 metre, Let the angle of elevation of the sun is = θ;

Then

$\tan\theta = \frac{6\sqrt{3}}{6} = \sqrt{3} \Rightarrow \theta = 60^\circ$

So, then the angle of elevation of the sun is 60°.

Sol.39.(c)



In triangle ROA

$\tan\theta = \frac{RO}{OA} \Rightarrow \tan 45° = \frac{RO}{100}$

RO = 100 m

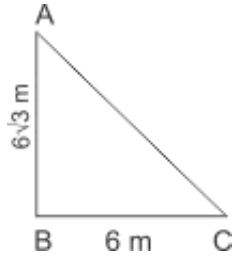
Now , in triangle SOA

$\tan 60° = \frac{SO}{OA}$

SO = $100\sqrt{3}$ = 100 × 1.732 = 173.2

Height of the wooden portion of the pole = 173.2 - 100 = 73.2 m

Sol.40.(b)

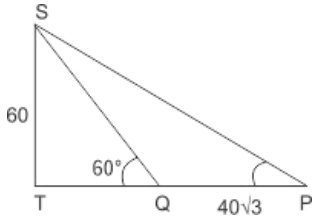


$\tan\theta = \frac{P}{B} \Rightarrow \tan\theta = \frac{6\sqrt{3}}{6}$

$\tan\theta = \sqrt{3}$

$\tan\theta = \tan 60^\circ \Rightarrow \theta = 60^\circ$

Sol.41.(b)



In ΔSTQ

$\tan 60° = \frac{60}{TQ} \Rightarrow \sqrt{3} = \frac{60}{TQ} \Rightarrow TQ = \frac{60}{\sqrt{3}}$

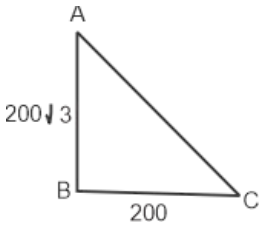
In ΔSTP

$\tan\theta = \frac{60}{\frac{60}{\sqrt{3}} + 40\sqrt{3}}$

$= \frac{60\sqrt{3}}{60+120} = \frac{60\sqrt{3}}{180} = \frac{1}{\sqrt{3}} = tan\ 30°$

$\Rightarrow \theta = 30°$

Sol.42.(b)



From triangle ABC

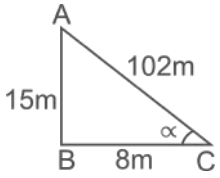
Given , AB = $200\sqrt{3}$m , BC = 200 m

Now , $\tan\theta = \frac{AB}{BC}$

$\Rightarrow \tan\theta = \frac{200\sqrt{3}m}{200} \Rightarrow \tan\theta = \sqrt{3}$

$\tan\theta = \tan 60° \Rightarrow \theta = 60°$

Sol.43.(b)



$\tan\alpha = \frac{15}{8} = \frac{p}{b}$

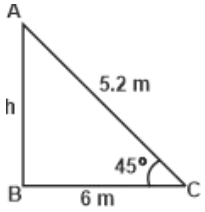
$h = \sqrt{15^2 + 8^2} = \sqrt{289} = 17$

A/Q,

17 unit = 102 m

$\Rightarrow$ 15 unit = $\frac{102}{17} \times 15 = 90\ m$

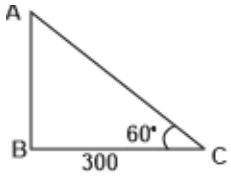
Sol.44.(c)



$\text{Sin } 45° = \frac{h}{5.2} \Rightarrow \frac{1}{\sqrt{2}} = \frac{h}{5.2}$

$\Rightarrow h = \frac{5.2}{\sqrt{2}} = \frac{52\sqrt{2}}{20} = \frac{13\sqrt{2}}{5}$ m

Sol.45.(c)



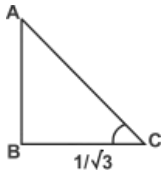
In triangle ABC

BC = 300 m

$\tan\theta = \frac{AB}{BC} \Rightarrow \tan 60° = \frac{AB}{300}$

$\Rightarrow \sqrt{3} = \frac{AB}{300} \Rightarrow AB = 300\sqrt{3}$

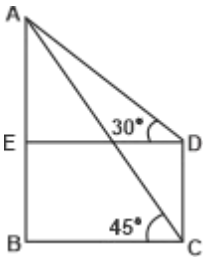
Sol.46.(c)



$\tan\theta = \frac{1}{\frac{1}{\sqrt{3}}} \Rightarrow \tan\theta = \sqrt{3}$

$\Rightarrow \tan\theta = \tan 60° \Rightarrow \theta = 60°$

Sol.47.(c)



Given , CD = 200m , BE = 200 m , AE = x meter

In triangle ABC

$\tan\theta = \frac{AB}{BC} \Rightarrow \tan 45° = \frac{200 + x}{BC}$

$1 = \frac{200 + x}{BC} \Rightarrow BC = 200 + x$

ED = BC = 200 + x

Then , triangle AED

$\tan\theta = \frac{AE}{ED}$

$\tan 30° = \frac{x}{200 + x} \Rightarrow \frac{1}{\sqrt{3}} = \frac{x}{200 + x}$

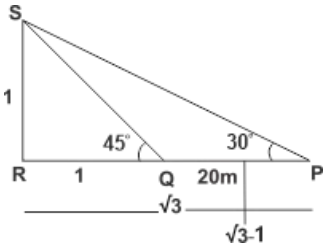
$\Rightarrow x = \frac{200}{(\sqrt{3} - 1)} \Rightarrow x = 100(\sqrt{3} + 1)$

Hence ,

AB = 200 + x = 200 + $100\sqrt{3}$ + 100

= 300 + $100\sqrt{3} = 100\sqrt{3}\ (\sqrt{3} + 1)$

Sol.48.(a)



A/Q,

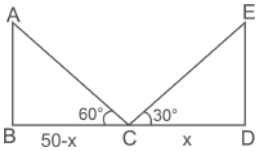
$\sqrt{3} - 1\ unit = 20\ m$

$\Rightarrow \sqrt{3}\ unit = \frac{20}{\sqrt{3} - 1} \times \sqrt{3}$

$= \frac{20}{1.732 - 1} \times 1.732$

$= \frac{20 \times 1.732}{0.732} = 47.32\ m$

Sol.49.(d)



In Δ ABC

$\text{Tan } 60° = \frac{AB}{(50 - x)}$

$\rightarrow AB = (50 - x)\sqrt{3}$ .....eq .(1)

In Δ ECD

$\text{Tan } 30° = \frac{ED}{x} = ED = \frac{x}{\sqrt{3}}$ .....eq(2)

Solve eq .(1) and eq(2)

$\frac{x}{\sqrt{3}} = (50 - x)\sqrt{3} \Rightarrow x = 150 - 3x$

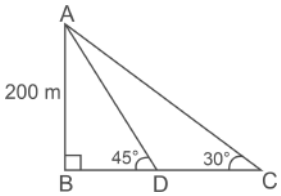
$\Rightarrow 4x = 150 \Rightarrow x = \frac{75}{2}$

So length of lamp-posts = ED =AB

$= \frac{75}{2 \times \sqrt{3}} = \frac{25 \times \sqrt{3}}{2} = 12.5\sqrt{3}$

$= 12.5 \times 1.73 = 21.65$ m

Sol.50.(c)



In ΔABD

$\tan 45° = \frac{AB}{BD}$

$\Rightarrow$ AB = BD = 200m .....e.q .(1)

In ΔABC

$\tan 30° = \frac{AB}{BC}$

$\Rightarrow BC = \sqrt{3}AB = 200\sqrt{3}$ .....e.q .(2)

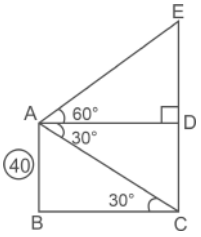
from e.q .(1) and e.q .(2)

$DC = BC - BD = 200(\sqrt{3} - 1)$

$\text{Speed} = \frac{Distance}{Time} = \frac{200(\sqrt{3} - 1)}{100}$

Speed = 2 ×.732 = 1.464 m/s ≈1.5m/s

Sol.51.(a)



Let , AB is the height of the tower and CE is the height of the chimney.

In ΔABC ,

$\tan 30° = \frac{40}{BC} \Rightarrow$ BC = $40\sqrt{3}$ m = AD

In ΔADE ,

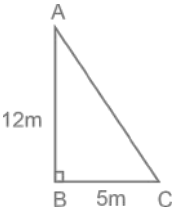
$\tan 60° = \frac{ED}{AD} = \frac{ED}{40\sqrt{3}} \Rightarrow$ ED = 120 m

Height of chimney (CE)

$\Rightarrow$ (DE + DC) = (DE + AB)

$= (120 + 40) = 160$m

Sol.52.(d)

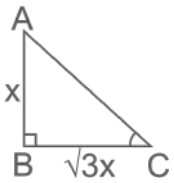


From pythagoras theorem,

Height of the ladder = $\sqrt{5^2 + 12^2}$

$= \sqrt{25 + 144} = \sqrt{169} = 13\ m$

Sol.53.(a)

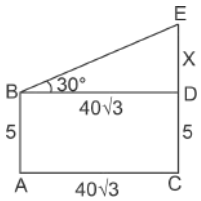


tan C = $\frac{AB}{BC} = \frac{x}{\sqrt{3}x}$

$tanC = \frac{1}{\sqrt{3}} \Rightarrow \angle C = 30°$

So, angle of elevation from the sun = 30°

Sol.54.(d)



Let AB and CE be the length of platform and tower respectively

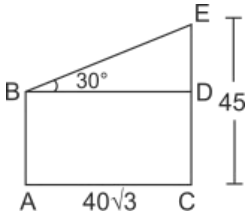
In △BED, we have :

tan30° = $\frac{ED}{BD} = \frac{x}{40\sqrt{3}}$

$\Rightarrow \frac{1}{\sqrt{3}} = \frac{x}{40\sqrt{3}} \Rightarrow$ x = 40 m

So, the height of tower = 5 + 40 = 45 m

Sol.55.(c) Let AB and CE be the height of platform and tower respectively



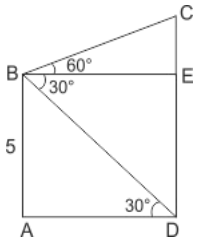
In △ BDE, we have

tan30° = $\frac{ED}{BD} = \frac{ED}{40\sqrt{3}} \Rightarrow \frac{1}{\sqrt{3}} = \frac{ED}{40\sqrt{3}}$

⇒ ED = 40 m , DC = 45 - 40 = 5 m

So,the height of platform = 5m

Sol.56.(b)



Let AB and CD be the height of building and tower respectively

In △ABD,

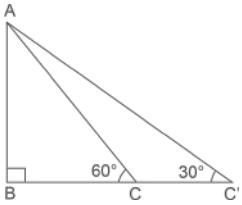
tan30° = $\frac{5}{AD} \Rightarrow \frac{1}{\sqrt{3}} = \frac{5}{AD} \Rightarrow$ AD = $5\sqrt{3}$ m

Now, In △BCE, tan60° = $\frac{CE}{5\sqrt{3}}$

$\Rightarrow \sqrt{3} = \frac{CE}{5\sqrt{3}} \Rightarrow$ CE = $5\sqrt{3} \times \sqrt{3}$ = 15 m

So, the height of tower = 5 + 15 = 20 m

Sol.57.(d)



Let the initial and final position of the woman at C and C'

In △ABC,

tan 60° = $\frac{36}{BC}$

$\Rightarrow \sqrt{3} = \frac{36}{BC} \Rightarrow$ BC = $\frac{36}{\sqrt{3}} = 12\sqrt{3}$ m

In △ABC', tan30° = $\frac{36}{12\sqrt{3} + CC'}$

$\Rightarrow \frac{1}{\sqrt{3}} = \frac{36}{12\sqrt{3} + CC'} \Rightarrow 12\sqrt{3}$ + CC' = $36\sqrt{3}$

⇒ CC' = $36\sqrt{3}$ - $12\sqrt{3}$ = $24\sqrt{3}$ m

So, she walk from her initial position by $24\sqrt{3}$ m

Mensuration

2- D: Under 2 dimensions we will study

- Triangles
- Quadrilateral
- Polygons
- Circle

3 - D: Under 3 dimensions we will study

- Cube
- Cuboids
- Box
- Cylinder
- Prism
- Cone
- Pyramid
- Frustum
- Sphere
- Hemisphere
- Tetrahedral

Note: For 2D figures, area and perimeter are calculated and for 3D figures, volume and surface area are calculated.

TWO DIMENSIONAL FIGURES

TRIANGLE

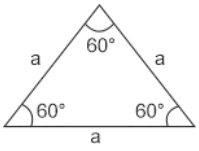
For a triangle with height, h, and base, b;

Area = $\frac{1}{2} \times b \times h$ and Perimeter

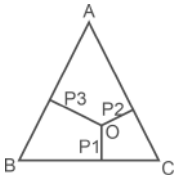
= Sum of all sides

Special cases:

1) Equilateral Triangle - All sides are equal and each angle is $60°$.



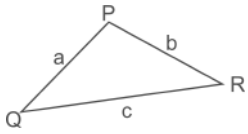
- Area = $\frac{\sqrt{3}}{4}a^2$
- Height = $\frac{\sqrt{3}}{2}a$
- Perimeter = $3a$
- Inradius(r) = $\frac{a}{2\sqrt{3}}$
- Circumradius(R) = $\frac{a}{\sqrt{3}}$



If P1, P2 and P3 are perpendicular to a side from a point inside the triangle, then

- Height of triangle = P1 + P2 +P3

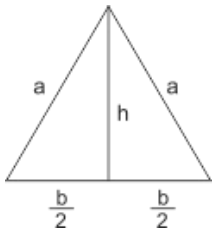
2) Scalene Triangle – Sides are of unequal lengths.



Area = $\sqrt{s(s-a)(s-b)(s-c)}$,
This formula is called Heron's formula.
Where, Semi-perimeter,
$s = \frac{a+b+c}{2}$

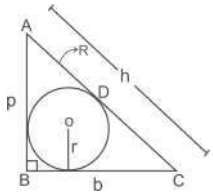
- Perimeter = $a + b + c$

3) Isosceles Triangle :- two sides and two angles are equal. Altitude bisects the base.



- Area = $\frac{b}{4}\sqrt{4a^2 - b^2}$
- Height = $\sqrt{a^2 - \left(\frac{b}{2}\right)^2}$
  $= \frac{1}{2}\sqrt{4a^2 - b^2}$
- Perimeter = $a + a + b$
  $= 2a + b$

4) Right angled Triangle :- One of the angles is 90°.



Here, p = perpendicular , b = base and h = hypotenuse

- Area = $\frac{1}{2} \times b \times p$
- Perimeter = $p + b + h$
- Pythagoras Theorem:
  $h^2 = p^2 + b^2$
- Inradius(r) = $\frac{p+b-h}{2}$
- Circumradius(R) = $\frac{h}{2}$

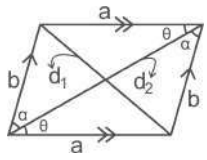
Note: Common Pythagoras triplets:
(1 , 1 , $\sqrt{2}$) ; (1 , 2 , $\sqrt{5}$) ; (3 , 4, 5); (5 , 12, 13); (7, 24, 25); (20, 21, 29), (9, 40, 41); (8, 15, 17) (12, 35, 37) (60, 11, 61) (65, 72, 97) (96, 110, 146).
Try remembering them.

QUADRILATERAL

A figure enclosed by four sides is called a quadrilateral. A quadrilateral has four angles and sum of these angles is equal to 360°.

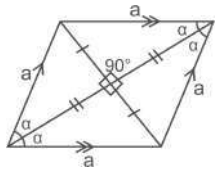
Special Cases:

1) Parallelogram - It is a quadrilateral with opposite sides parallel and equal.



- Area = base x height
- Perimeter = 2 (a + b)
- $d_1^2 + d_2^2 = 2(a^2 + b^2)$
- In a parallelogram, opposite sides are equal, opposite angles are equal and diagonals bisect each other.

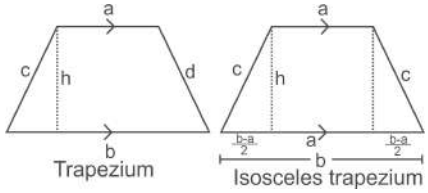
2) Rhombus - It is a parallelogram with all four sides equal. The opposite angles in a rhombus are equal.



Here, a = side; d_1 and d_2 are diagonals.

- Area = $\frac{1}{2} \times d_1 \times d_2$
- Side (a) = $\frac{1}{2}\sqrt{d_1^2 + d_2^2}$
- Perimeter = 4a
- $4a^2 = d_1^2 + d_2^2$
  Diagonals bisect each other at right angles .

3) Trapezium – It is a quadrilateral with one pair of opposite sides parallel.



Here, a and b are parallel sides and h is the height or perpendicular distance between a and b.

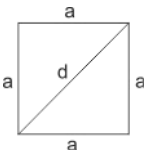
- Area = $\frac{1}{2} \times height \times (sum\ of\ parallel\ sides)$
  $= \frac{1}{2} \times h \times (a + b)$

4) Rectangle– It is a parallelogram with equal opposite sides and each angle is 90°

- Area = Length × Breadth = L × B
- Perimeter = 2 (L + B)
- Diagonal (d) = $\sqrt{L^2 + B^2}$

- Area of the walls of a rectangular room
  $= 2 \times (L + B) \times H$

5) Square – It is a parallelogram with all four sides equal and each angle is equal to 90°.



- Area = $(side)^2 = a^2 = \frac{1}{2}d^2$
- Perimeter = 4 × side = 4a
- Diagonal (d) = $a\sqrt{2}$

NOTE: Important points about Quadrilaterals

1. The diagonals of a parallelogram bisect each other.
2. Diagonal of a parallelogram divides it into two triangles of equal area.
3. The diagonals of a rectangle are of equal lengths and bisect each other.
4. The diagonals of a square are equal and bisect each other at right angles.
5. A rhombus has unequal diagonals and they bisect each other at right angles.
6. A parallelogram and a rectangle have equal areas if they are on the same base and between the same parallel Lines.

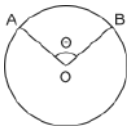
REGULAR POLYGON

In a regular polygon all sides and all interior angles are equal. A polygon is called a pentagon, hexagon , heptagon , octagon, nonagon and a decagon as they have 5, 6, 7 , 8, 9, 10 sides, respectively.
If each side of a regular polygon of 'n' sides is equal to 'a' then:

- Area of regular pentagon
  $= 5 \times \frac{\sqrt{3}}{4}a^2$
- Area of regular hexagon
  $= 6 \times \frac{\sqrt{3}}{4}a^2$
- Each exterior angle $= \frac{360°}{n}$
- Each interior angle
  = 180° − Exterior angle
- Number of diagonals
  $= \frac{n(n-3)}{2}$
- Sum of all interior angles
  $= (n - 2) \times 180$
- Sum of all exterior angle = 360°

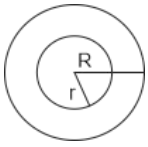
CIRCLE

It is a plane figure enclosed by a line on which every point is equally distant from a fixed point (centre) inside the circle.



- Area = πr^2
- Circumference (perimeter)
  $= 2\pi r$
- Diameter = 2r
- Length of Arc (AB)
  $= 2\pi r \times \frac{\theta}{360°}$
- Area of sector AOB
- $= \pi r^2 \times \frac{\theta}{360°}$
- Length of Arc (AB) = $angle \times radius$, (where angle in radian)

CIRCULAR RING



Here, R = radius of bigger ring ,
r = radius of smaller ring

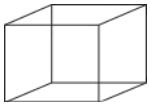
- Area = $\pi(R^2 - r^2)$
- Difference in circumference of both the rings = $2\pi R - 2\pi r$

Short Cut methods/Tricks

1. If the length and breadth of a rectangle are increased by a% and b%, the area of the rectangle will be increased by
   $(a + b + \frac{ab}{100})\%$
2. If any of the two sides of the rectangle s decreased then use '–ve' values for a.
3. All the sides of any two dimensional figure changed by a%, then its area will change by $(2a + \frac{a^2}{100})\%$
   Whenever there is a decrease, use negative value for 'a'
4. If all the sides of any two dimensional figure has changed (increased or decreased) by a% then its perimeter also changes by a%. In the case of a circle such changes take place because of the change in radius (or diameter).
5. If the area of a square is 'a' square unit. Then the area of the circle formed with the same perimeter is given by square units.
6. Area of a square inscribed in a circle of radius 'r' is equal to $2r^2$.
7. The area of the largest triangle inscribed in a semicircle of radius r is equal to r^2.
8. If a pathway of width x is made inside or outside a rectangular plot of length L and breath B, then area of the pathway is
   (i) $2x(L + B + 2x)$, if path is made outside the plot
   (ii) $2x(L + B - 2x)$, if a path is made inside the plot.
9. If two paths, each of width x are made parallel to length (L) and breadth (B) of the rectangular plot in the middle of the plot crossing each other, then,
   Area of the path $= x(L + B - x)$

THREE DIMENSIONAL FIGURES

CUBE



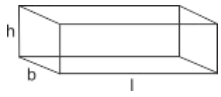
All sides are equal. It has six faces and 12 edges.

- Volume = a^3
- Total surface area = $6a^2$
- Diagonal = $a\sqrt{3}$
- Sum of all edges = 12a

Here, a = length of the side

CUBOID

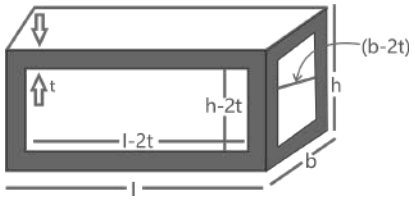
A rectangular body having 3D rectangular shape, is called a cuboid.



- Volume = $l \times b \times h$
- Total surface area
  $= 2(lb + bh + lh)$
- Diagonal = $\sqrt{l^2 + b^2 + h^2}$

BOX

A box has its shape like a cube or cuboid. The amount that a box can hold or contain is called the capacity of the box. Capacity means internal volume.



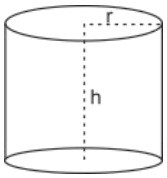
- Surface area of an open box
  = 2 (length + breadth) × height + length × breadth
  $= 2(l + b) \times h + l \times b$
- Capacity of box
  $= (l - 2t)(b - 2t)(h - 2t)$;
  where, t = thickness of box
- Volume of the material of the box = External volume – Internal volume(or capacity) = $lbh - (l - 2t)(b - 2t)(h - 2t)$

ROOM

A rectangular room has four walls (surfaces) and opposite walls have equal area.

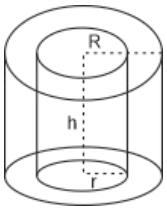
- Total Area of walls
  $= 2(l + b) \times h$
- Total volume of the room
  $= l \times b \times h$
- Area of floor or roof = $l \times b$

CYLINDER



- Volume of cylinder = area of base × height = $\pi r^2 h$
- Curved surface area = Perimeter of base × height = $2\pi rh$
- Total surface Area = curved surface area + area of both the circles
  $= 2\pi rh + 2\pi r^2 = 2\pi(r + h)r$
- When the rectangular sheet is folded along its length, then the length becomes the circumference of the base of the cylinder and breadth becomes the height of the cylinder.

HOLLOW CYLINDER



- Volume of hollow cylinder
  $= \pi(R^2 - r^2)h$
- Curved surface area
  $= 2\pi(R + r)h$
- Total surface area
  $= 2\pi(R + r)h + 2\pi(R^2 - r^2)$
  $= 2\pi(R + r)\{h + R - r\}$

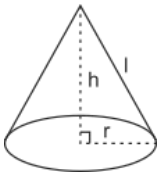
Where, R = External radius of cylinder , r = internal radius of cylinder , h = height

PRISM

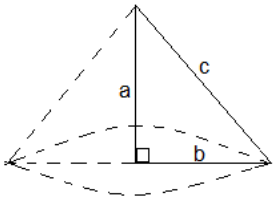
- Volume of prism
  = area of base × height
- Lateral surface area = Perimeter of base × height
- Total surface Area = Lateral surface area + area of base and top surface

CONE

A solid and round body with a round base and pointed peak.



- Volume = $\frac{1}{3} \times base\ area \times$ height = $\frac{1}{3}\pi r^2 h$
- Slant height (l) = $\sqrt{r^2 + h^2}$
- Curved surface area
  $= \pi rl = \pi r\sqrt{r^2 + h^2}$
- Total surface area = $\pi rl + \pi r^2 = \pi r(l + r)$
- Cone formed by rotating right angled triangle about its height:



- Volume of cone so formed
  $= \frac{1}{3}\pi b^2 a$
- Similarly, Cone formed by rotating right angled triangle about its base:
  Volume of cone so formed
  $= \frac{1}{3}\pi a^2 b$
- Similarly, Cone formed by rotating right angled triangle about its hypotenuse :
  Volume of cone so formed
  $= \frac{1}{3}\pi r^2 c$, (where r is the altitude on hypotenuse and r = $\frac{a \times b}{c}$)

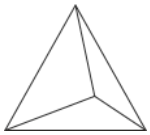
Note: If the base is not round, it will be called a pyramid. A pyramid can have various shapes of the base example: square, rectangular, triangular etc.

PYRAMID

- Pyramid means a structure with regular polygon as its base and sloping sides that meet in a point at the top.
- In Pyramid, with n sided regular polygon at its base, total number of vertices = n + 1
- Volume
  $= \frac{1}{3} \times base\ area \times height$
- Slant height (l) = $\sqrt{r^2 + h^2}$
- Lateral surface area
  $= \frac{Perimeter \times slant\ height}{2}$
- Total Surface area = Lateral surface area + Area of base

TETRAHEDRON

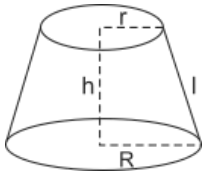
It is a 3D figure made by joining four equilateral triangles.



- Volume (V)
  $= \frac{1}{3} \times base\ area \times height$
  $\Rightarrow V = \frac{1}{3} \times \frac{\sqrt{3}}{4}$
  $a^2 \times (\frac{\sqrt{6}}{12}a + \frac{\sqrt{6}}{4}a)$
  $\Rightarrow V = \frac{\sqrt{2}}{12}a^3$!! Remember this formula!
- Lateral surface area = $3 \times \frac{\sqrt{3}}{4} a^2$
- Total surface area
  $= 4 \times \frac{\sqrt{3}}{4}a^2$
- Height of Tetrahedron = $\frac{\sqrt{6}}{3}a$

FRUSTUM OF CONE

If a cone is cut by a plane parallel to its base, so as to divide the cone into two parts: upper part and lower part, then the lower part is called frustum.



- Slant height (l)
  $= \sqrt{h^2 + (R - r)^2}$
- Curved Surface Area
  $= \pi(R + r)l$
- Total surface area
  $= \pi(R + r)l + \pi R^2 + \pi r^2$
  $= \pi\{(R + r)l + R^2 + r^2\}$
- Volume = $\frac{1}{3}\pi h(r^2 + R^2 + rR)$

SPHERE

- Volume of sphere = $\frac{4}{3}\pi r^3$

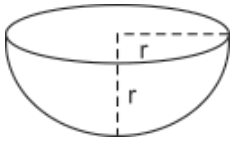
- Curved Surface area
  = Total surface area = $4\pi r^2$

HOLLOW SPHERE OR SPHERICAL SHELL:

- Volume of hollow sphere
  = $\frac{4}{3}\pi(R^3 - r^3)$
- Internal surface area = $4\pi r^2$
- External surface area = $4\pi R^2$

Here R = external radius and
r = internal radius

HEMISPHERE



- Volume of the hemisphere
  = $\frac{2}{3}\pi r^3$
- Total surface area = $3\pi r^2$
- Curved surface area = $2\pi r^2$
  Where, r = radius

IMP. UNIT CONVERSION :

- $1m^3$ = 1000 litres and
- 1 litre = 1000 cm^3
- 1 meter = 10 decimeter
  = 100 cm = 1000 millimeter
- 1 meter = 10^{-1} decameter
  = 10^{-2} hectometer
  = 10^{-3} kilometer

Variety Questions

Q.1. A water tank is in the form of a cube of side 2 m. It has an inlet in the shape of a circle with radius 3.5 cm. How long will it take to fill the tank (approximately), if the water is flowing at a speed of 2 m/s?
Group D 17/08/2022 (Morning)
(a) 19.2 minutes (b) 17.3 minutes
(c) 1 hour (d) 22 minutes

Q.2. If the length of a rectangle is increased by 4m, and the breadth is decreased by 2m, then its area is increased by $2m^2$. If its length is decreased by 3m, and breadth is increased by 5m, then its area is increased by $23m^2$. Find the perimeter (in m) of the original rectangle.
Group D 06/09/2022 (Afternoon)
(a) 52 (b) 44 (c) 48 (d) 42

Q.3. A factory built in the shape of a cuboid except for its roof had its dimensions given as 140 m x 10m x 10m. The structure is then closed on the top with a semi-cylindrical structure to exactly cover the open top of the cuboidal structure. The volume (in m³) of the semi-cylindrical structure forming the roof is: Take $\pi = \frac{22}{7}$
Group D 17/09/2022 (Afternoon)
(a) 13000 (b) 5500 (c) 11000 (d) 6500

Q.4. The volume of a cuboid is $5a^2 - 80b^2$. Which of the options below can be possible dimensions of the cuboid?
Group D 18/09/2022 (Evening)
(a) 5, 2a - b , 2a + b (b) 5, a - 4b , a + 4b
(c) 5, a - b , a + 4b (d) 5, 2a - b, a + 2b

Q.5. John has a cuboidal box whose length, breadth and height are in the ratio 2:3: 5. If the length, the breadth and the height of this box are each increased by 100% to make a new box, then the volume of the new box is how many times the volume of the old box?
Group D 26/09/2022 (Afternoon)
(a) 9 times (b) 8 times
(c) 6 times (d) 7 times

Q.6. 48 square plates of side 2 cm are arranged in the form of a rectangle such that its sides are in the ratio 3 : 4. Find the perimeter of the rectangle (in cm).
NTPC CBT II Level 5 (15/06/2022) Shift 2
(a) 56 (b) 52 (c) 48 (d) 58

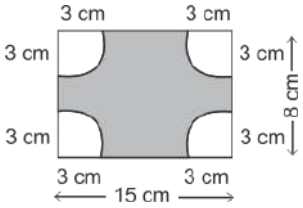
Q.7. The radius of a cylinder is $16\frac{2}{3}\%$ more than the radius of a hemisphere. The height of the cylinder is 21 cm. Find the volume of the hemisphere if the volume of the Cylinder is equal to the volume of another sphere having radius 7 cm. (Calculate to two decimal places use $\pi = \frac{22}{7}$)
NTPC CBT II Level 2 (16/06/2022) Shift 3
(a) 136.09 cm^3 (b) 132.08 cm^3
(c) 134.10 cm^3 (d) 133.04 cm^3

Q.8. A 2 m deep and 21 m wide river is flowing at the rate of 5 km/h. How many kilolitres of water will fall into the sea in 10 min?
NTPC CBT - I 29/12/2020 (Morning)
(a) 35000 kl (b) 3500 kl
(c) 350 kl (d) 33000 kl

Q.9. A rhombus has one of its diagonal 65% of the other. A square is drawn using the longer diagonal as side. What will be the ratio of the area of the rhombus as that of the square?
NTPC CBT - I 04/01/2021 (Evening)
(a) 18: 15 (b) 13 : 40 (c) 15 :18 (d) 40 :13

Q.10. A few lead spheres of diameter 6 cm are dropped into a cylindrical beaker containing some water such that they are fully submerged. If the diameter of the beaker is 9 cm and the water level has risen by 32 cm, find the number of lead spheres dropped into the beaker.
NTPC CBT - I 04/01/2021 (Evening)
(a) 18 (b) 15 (c) 16 (d) 14

Q.11. Find the area of the shaded region.



NTPC CBT - I 10/01/2021 (Morning)
(a) $\frac{588}{7}cm^2$ (b) $\frac{12}{7}cm^2$
(c) $\frac{78}{7}cm^2$ (d) $\frac{642}{7}cm^2$

Q.12. A rectangle has a length 3 m more than its width and a perimeter numerically equal in value to its area. The integral part of the value of its diagonal is.
NTPC CBT - I 13/01/2021 (Morning)
(a) 6 (b) 8 (c) 7 (d) 9

Q.13. For a room, if length and breadth are given by L = (3x + 10) m and B = (2x + 5) m and the area of 4 of its walls together is (60x + 180) sq units, then the height of the room is:
NTPC CBT - I 19/01/2021 (Morning)
(a) 9 m (b) 5 m (c) 8 m (d) 6 m

Q.14. If in a circle of radius r = 36 cm a sector of arc length l, satisfies 4l = 3r, then the area of the sector is..
NTPC CBT - I 21/01/2021 (Evening)
(a) 496 cm² (b) 486 cm²
(c) 476 cm² (d) 461 cm²

Q.15. A rectangular courtyard is 18 m 72 cm long and 13 m 20 cm broad. It is to be paved with square tiles all of the same sizes. Find the least possible number of such tiles required?
NTPC CBT - I 28/01/2021(Morning)
(a) 4290 (b) 4295 (c) 4292 (d) 4294

Q.16. Four cows are tethered to the four corners of a square field of length 28m so that each Cow can just touch the two cows in the adjacent corners. If the grass in the area inside the square field that

was accessible to the cows was enough to feed them for 22 days, for how many days would the grass that is beyond the reach of these cows be able to feed them if someone cuts it and leaves it inside the grazable part?(Use π = 22/7)
NTPC CBT - I 02/02/2021 (Morning)
(a) 6 (b) 5 (c) 4 (d) 7

Q.17 What is the minimum radius (> 1) of a circle whose circumference is an integer?
NTPC CBT - I 10/02/2021 (Morning)
(a) $\frac{3}{\pi}$ (b) $\frac{6}{\pi}$ (c) $\frac{4}{\pi}$ (d) 2

Q.18. In a swimming pool measuring 90 m × 40 m, 150 men take a dip. If the average displacement of water by a man is 8 m^3, then what will be the rise in the water level of the pool?
NTPC CBT - I 10/02/2021 (Evening)
(a) 33.33cm (b) 30cm (c) 25cm (d) 20cm

Q.19. Manish fixed 48 poles in order to fence a square. If the distance between 2 poles is 5 m, then what will be the area of the square formed?
NTPC CBT - I 11/02/2021 (Morning)
(a) 3200 m^2 (b) 3600 m^2
(c) 3500 m^2 (d) 4000 m^2

Q.20. What is the area of the region swept by the minute hand 6 cm long, of a wall clock, in an interval of 5 minutes?
NTPC CBT - I 23/02/2021 (Morning)
(a) 9.8 cm^2 (b) 9.63 cm^2
(c) 9.6 cm^2 (d) 9.43 cm^2

Q.21. A rectangle with dimension of 24 cm and 28 cm was reconstructed to make a rhombus with the same perimeter as that of the rectangle and 120° as one of its angles. The area of the rhombus was:
NTPC CBT - I 02/03/2021 (Morning)
(a) $\frac{338\sqrt{3}}{3}\ cm^2$ (b) $\frac{169\sqrt{3}}{3}\ cm^2$
(c) $169\sqrt{3}\ cm^2$ (d) $338\sqrt{3}\ cm^2$

Q.22. When the radius of a wheel is increased by 8% then find the ratio of the number of revolutions required by the old to the new wheel in traveling a distance of 100 m.
NTPC CBT - I 02/03/2021 (Evening)
(a) 27 : 25 (b) 23 : 25
(c) 20 : 23 (d) 27 : 20

Q.23. If the length of a rectangle is doubled, what change should be made in its breadth so that its area remains the same?
NTPC CBT - I 03/03/2021 (Evening)
(a) Breadth should be halved
(b) Breadth should be kept unchanged
(c) Breadth should be made one fourth
(d) Breadth should be doubled

Q.24. A pyramid is placed on a cube of side 10 cm such that the base of the pyramid is completely aligned with the top face of the cube. The altitude of the pyramid is thrice the side of the cube. Find the volume of the entire object.
NTPC CBT - I 11/03/2021 (Evening)
(a) 2000 cm^3 (b) 2250 cm^3
(c) 1600 cm^3 (d) 1000 cm^3

Q.25. A Cylindrical vessel of inner radius 4cm contains water up to some height. A solid sphere of radius 3cm is lowered into the water until it is completely immersed. The water level in the vessel will rise by.
NTPC CBT - I 12/03/2021 (Evening)
(a) $\frac{9}{2}\ cm$ (b) $\frac{2}{9}\ cm$ (c) $\frac{9}{4}\ cm$ (d) $\frac{4}{9}\ cm$

Q.26. From a circular sheet of radius 20cm, three circles of radius 6 cm each are cut off. What is the ratio of the area of uncut to the area of the cut portion?
NTPC CBT - I 19/03/2021 (Evening)
(a) 73:37 (b) 73:25 (c) 73:23 (d) 73:27

Q.27. In a cuboid, the sum of the squares of its three dimensions is equal to half of its total surface area. If the volume of the cuboid is 729 cm^3,then find its lateral surface area(in cm^2).
NTPC CBT - I 31/07/2021 (Morning)
(a) 648 (b) 576 (c) 900 (d) 324

Q.28. A 2 m broad pathway is to be constructed around a rectangular plot on the inside. The area of the plot is 96 m². The rate of construction is Rs.50 per m². Find the total cost of the construction.
RRB JE 25/05/2019 (Morning)
(a) Rs.4800 (b) data insufficient
(c) Rs.4000 (d) Rs.2400

Q.29. A room is 15 ft long and 12 ft broad. A mat has to be placed on the floor of this room leaving 1.5 ft space from the walls. What will be the cost of the mat at the rate of Rs.3.50 per square feet?
RRB JE 30/05/2019 (Afternoon)
(a) Rs.630 (b) Rs.378
(c) Rs.472.50 (d) Rs.496

Q.30. A hemispherical portion is scooped out of a wooden block such that the diameter "l' of the hemisphere equals the edge of the cubical block. What is the surface area of the resulting solid ?
RRB JE 26/06/2019 (Morning)
(a) $(\frac{l^2}{4})(\pi + 24)$ (b) $l^2[(\frac{\pi}{4}) + 8]$
(c) $\pi(l^2 + b)$ (d) $l^2[(\frac{\pi}{2}) + 12]$

Q.31. A square park having a side 22 m has two roads each 2m wide running in the middle of it and parallel to its length and breadth. What will be the cost of gravelling the path at the rate of ₹100/m²?
ALP Tier - I 20/08/2018 (Afternoon)
(a) ₹88 (b) ₹8,400 (c) ₹8,800 (d) ₹84

Q.32. A sphere is split in the ratio 1:3. The larger part is molded into a cone having a height equal to the radius of its base, while the smaller part is molded into a cylinder having a height equal to the radius of its base. What would be the ratio of the radius of the base of the cone to the height of the cylinder ?
ALP Tier - I 30/08/2018 (Afternoon)
(a) $\sqrt[3]{3}$: 1 (b) $\sqrt[3]{9}$: 1
(c) 3 : 1 (d) 1 : $\sqrt[3]{3}$

Q.33. From each corner of a square with an edge of 4 cm, a 1 cm segment was chopped off from each side containing a vertex. What is the perimeter and the area of the octagon thus created ?
ALP Tier - I 30/08/2018 (Afternoon)
(a) (8 + 4√2) cm; 14 cm ²
(b) 4√2 cm; 14 cm²
(c) 4 + 4√2 cm; 14 cm²
(d) 16 cm, 12 cm²

Q.34. The sum of the lengths of the edges of a cube is equal to half the perimeter of a square. If the numerical value of the volume of the cube is equal to one - sixth of the numerical value of the area of the square, then the length of one side of the square is:
ALP Tier - I 31/08/2018 (Afternoon)
(a) 31.5 units (b) 36 units
(c) 27 units (d) 18 units

Q.35. What will be the height of a cuboid made by melting a cube of diagonal 21 $\sqrt{3}$ cm , if the length of the cuboid is equal to the side of the cube and the breadth of the cuboid is 10.5 cm?
RPF S.I. 06/01/2019 (Afternoon)
(a) 42 (b) 45 (c) 44 (d) 43

Practice Questions

RRC Group D

(17/08/2022 to 11/10/2022)

Q.36. If the perimeter of one face of a cube is 24 cm, then its volume is:
Group D 17/08/2022 (Morning)
(a) 180 cm^3 (b) 154 cm^3
(c) 200 cm^3 (d) 216 cm^3

Q.37. If the volume of a sphere is 36π cm^3, then the diameter of the sphere is:
Group D 17/08/2022 (Afternoon)
(a) 3 cm (b) 9 cm (c) 27 cm (d) 6 cm

Q.38. The diagonal and one side of a rectangular plot are 65 m and 63 m. respectively. What is the perimeter(m) of the rectangular plot?
Group D 18/08/2022 (Afternoon)
(a) 158 (b) 256 (c) 225 (d) 196

Q.39. The total surface area of a cylinder of diameter 10 cm is 330 square centimeters. Find the height (cm) of the cylinder?
Group D 18/08/2022 (Evening)
(a)10.5 (b) 2.5 (c) 5.5 (d) 6.5

Q.40. How many spherical solid marbles, each having a radius of 0.3 cm can be made from a solid sphere having a radius of 6 cm?
Group D 18/08/2022 (Evening)
(a) 9000 (b) 7500 (c) 8000 (d) 8500

Q.41. The diagonal of a quadrilateral is 32 m long, and its two offsets are 6 m and 10 m long. The area of the quadrilateral is
Group D 22/08/2022 (Morning)
(a) 256 m^2 (b) 220 m^2
(c) 276 m^2 (d) 250 m^2

Q.42. A triangle has sides of length 5 cm, 7 cm and 10 cm. Find the area of the triangle (in cm^2).
Group D 22/08/2022 (Morning)
(a) 350 (b) $2\sqrt{66}$ (c) 25 (d) $7\sqrt{10}$

Q.43. In a right-angled triangle, if the hypotenuse is 4 units greater than one side and 8 units greater than the other, then find the area of the triangle.
Group D 22/08/2022 (Afternoon)
(a) 100 sq .units (b) 32 sq .units
(c) 96 sq . units (d) 16 sq .units

Q.44. If the radius of a sphere is increased by 2 cm, then its surface area increases by 704 cm^2 . Using(π = $\frac{22}{7}$), find the radius of the sphere before the increase.
Group D 22/08/2022 (Evening)
(a) 16 cm (b) 14 cm (c) 15 cm (d) 13 cm

Q.45. A cuboidal block, 12 cm by 24 cm by 30 cm, is cut up into an exact number of identical cubes. The least possible number of such cubes is:
Group D 22/08/2022 (Evening)
(a) 45 (b) 40 (c) 55 (d) 50

Q.46. Find the area of a rhombus whose diagonals are 12 cm and 15 cm long.
Group D 23/08/2022 (Morning)
(a) 45 cm^2 (b) 60 cm^2
(c) 90 cm^2 (d) 80 cm^2

Q.47. If the area of an equilateral triangle is $25\sqrt{3}$ cm^2 , then the length of each side of the triangle is:
Group D 23/08/2022 (Afternoon)
(a) 12 cm (b) 5 cm (c) 8 cm (d)10 cm

Q.48. If the surface area of a sphere is 36π cm^2 , then the radius of the sphere is: Group D 23/08/2022 (Afternoon)
(a) 3 cm (b) 4 cm (c) 5 cm (d) 2 cm

Q.49. Find the length of the side of an equilateral triangle whose area is $4\sqrt{3}$ square units.
Group D 23/08/2022 (Evening)
(a) 2 units (b) 3 units
(c) 16 units (d) 4 units

Q.50. The length of a cuboidal room is 15m, breadth 17m and height 21m. Find the cost of painting its walls and ceiling at the rate of ₹40/m^2
Group D 23/08/2022 (Evening)
(a) ₹44,250 (b) ₹ 63,960
(c) ₹58,912 (d) ₹ 285,126

Q.51. Find the area of the parallelogram whose base is 15 cm and the corresponding height is 6 cm.
Group D 24/08/2022 (Morning)
(a) 80 cm^2 (b) 45 cm^2
(c) 90 cm^2 (d) 60 cm^2

Q.52. Find the cost of fencing a rectangular plot of land at the rate of ₹ 30 per metre, whose area is 100 m^2 , and the length of one side is 20 m.
Group D 24/08/2022 (Afternoon)
(a) ₹ 1,500 (b) ₹ 2,400
(c) ₹ 3,000 (d) ₹ 1,200

Q.53 The floor of an office has dimensions 5 m x 3 m. The cost of painting the walls and ceiling is ₹7,440 at the rate of ₹60/m². Find the height of the room (in m).(rounded off to one decimal place)
Group D 24/08/2022 (Evening)
(a) 4.5 (b) 5.6 (c) 3.5 (d) 6.8

Q.54. A cube made of edge 18 m is completely filled with milk. The milk is transferred into a cuboid of length 27 m and height 7 m. The width of the cuboid is
Group D 25/08/2022 (Morning)
(a) 72.5 m (b) 54.6 m
(c) 12.7 m (d) 30.8 m

Q.55. How many cylinders of radius 10 cm and height 20 cm can be filled with water from a cylinder of radius 20 cm and height 100 cm full of water?
Group D 25/08/2022 (Afternoon)
(a) 20 (b) 30 (c) 60 (d) 40

Q.56. The radius and height of a cylinder are in the ratio 2 : 1 Find its total surface area if curved surface area is 616 m^2 .
Group D 25/08/2022 (Afternoon)
(a) 908 m^2 (b) 1848 m^2
(c) 1232 m^2 (d) 1512 m^2

Q.57. Find the volume of a cuboid whose length is 12 m, breadth is 10 m, and height is 15 m.
Group D 25/08/2022 (Evening)
(a) 1800 m^2 (b) 1800 m^3
(c) 1500 m^3 (d) 1500 m^2

Q.58. A parallelogram has one parallel side length of 12 cm and perpendicular distance between its base and other parallel side is 8 cm. Its area is_____
Group D 25/08/2022 (Evening)
(a) 96 cm^2 (b) 192 cm^2
(c) 48 cm^2 (d) 24 cm^2

Q.59. Find the total surface area of a closed cuboid whose length, breadth and height are 16 cm, 12 cm, and 8 cm, respectively.
Group D 26/08/2022 (Morning)
(a) 238 cm^2 (b) 382 cm^2
(c) 832 cm^2 (d) 823 cm^2

Q.60. In a trapezium field, PQRS, PQ || RS, PQ = 12m, RS = 22m, distance between PQ and RS is 14m. In this, two crops are to be sown in equal areas. Find the area available for each crop.
Group D 26/08/2022 (Afternoon)
(a) 119 m^2 (b) 213 m^2
(c) 190 m^2 (d) 238 m^2

Q.61. In a parallelogram ABCD, the length of the line joining the midpoints of AD and AC is 2 units. If the perimeter of the parallelogram is 20 units, then find the length of AD.
Group D 26/08/2022 (Afternoon)

(a) 6 units (b) 5 units
(c) 4 units (d) 8 units

Q.62. If the breadth and height of closed cuboid are 25% and 50% respectively of its length 12 cm, find the total surface area of the cuboid.
Group D 26/08/2022 (Evening)
(a) 252 cm^2 (b) 126 cm^2
(c) 522 cm^2 (d) 63 cm^2

Q.63. By what percent does the curved surface area of a cylinder decrease, if the radius is increased by 10% and the height is decreased by 40% ?
Group D 29/08/2022 (Morning)
(a) 24.3% (b) 34% (c) 20% (d) 51.6%

Q.64. If the total surface area of a closed cube is 1014 cm^2 , then the length of each edge of this cube is:
Group D 29/08/2022 (Evening)
(a)12 cm (b)13 cm (c) 14 cm (d) 16 cm

Q.65. Find the perimeter of a rhombus whose diagonals are of lengths 5 cm and 12 cm.
Group D 30/08/2022 (Morning)
(a) 20 cm (b) 26 cm (c) 24 cm (d) 25 cm

Q.66. Find the volume of a sphere whose diameter is 42 m.
Group D 30/08/2022 (Evening)
(a) 13,416 m^3 (b) 23,437 m^3
(c) 38,808 m^3 (d) 42,137 m^3

Q.67. Find the capacity of a spherical container of thickness 2 cm and external radius 9 cm. (Rounded off to 2 decimal places.) (Use $\pi = \frac{22}{7}$)
Group D 01/09/2022 (Morning)
(a) 1050.67 cm^3 (b) 1590.48 cm^3
(c) 1437.33 cm^3 (d) 1241.14 cm^3

Q.68. Five solid cubes, each of volume 216 cm^3, are joined end to end in a linear manner only (single row arrangement) to form a cuboid. What is the lateral surface area (in cm^2) of the cuboid?
Group D 01/09/2022 (Afternoon)
(a) 468 (b) 432 (c) 360 (d) 504

Q.69. The area of a square is 900 cm². Its perimeter is equal to the perimeter of a regular hexagon. What is the area (in cm²) of the hexagon?
Group D 01/09/2022 (Afternoon)
(a) 300 (b) $600\sqrt{3}$ (c) $400\sqrt{3}$ (d) 600

Q.70. Find the area of a trapezium (in sq . unit) with parallel sides of length 3 unit and 5 unit and the shortest distance between its parallel sides is 6 unit.
Group D 01/09/2022 (Evening)
(a) 15 (b) 48 (c) 24 (d) 12

Q.71. In△ ABC, DE ∥ AC, where D and E are the points on sides AB and BC, respectively. If BD = 4 cm and AD = $2\sqrt{2}$ cm, then what is the ratio of the area of △BDE to the trapezium ADEC?
Group D 01/09/2022 (Evening)
(a) $2 : (1 + \sqrt{2})$ (b) $2 : (1 + 2\sqrt{2})$
(c) $2 : (1 + 3\sqrt{2})$ (d) $1 : (1 + 2\sqrt{2})$

Q.72. The sides (in cm) of a right triangle are (x - 2), (x - 4) and x. Its area (in cm^2) is:
Group D 02/09/2022 (Morning)
(a) 40 (b) 60 (c) 12 (d) 24

Q.73. Find the curved surface area of a cylinder whose diameter of base is 14 m and height is 24 m. [Use $\Pi = \frac{22}{7}$]
Group D 02/09/2022 (Morning)
(a) 1065 cm² (b) 1056 cm²
(c) 1560 cm² (d) 1506 cm²

Q.74. How many cubic cm of water can a hemispherical container of radius 7 cm hold (rounded off to 2 decimal places) (use $\pi = \frac{22}{7}$) ?
Group D 02/09/2022 (Afternoon)
(a) 1437.33 (b) 616.25
(c) 154.75 (d) 718.67

Q.75. A solid metallic cuboid of sides 4 cm x 10 cm x 15 cm is melted and made into small identical dices of 2 cm x 2 cm x 2cm. How many such dices can be made ?
Group D 02/09/2022 (Evening)
(a) 75 (b) 43 (c) 40 (d) 36

Q.76. Find the surface area of a sphere whose diameter is equal to 14 cm.
Group D 05/09/2022 (Morning)
(a) 524 cm^2 (b) 1232 cm^2
(c) 616 cm^2 (d) 1048 cm^2

Q.77. The length, the breadth and the height of a closed cuboidal box are 2.5 m, 2 m and 90 cm, respectively. What would be the cost of a canvas needed to cover this box completely, if the cost of the canvas is ₹80 per m^2 ?
Group D 05/09/2022 (Afternoon)
(a) ₹1,502 (b) ₹1,600 (c) ₹1,448 (d) ₹1,750

Q.78. Find the volume of a cube whose edge is 8 cm.
Group D 05/09/2022 (Evening)
(a) 256 cm^3 (b) 264 cm^3
(c) 512 cm^3 (d) 521 cm^3

Q.79. A solid metallic sphere of radius 12 cm is melted and cast into 27 identical spheres. Find the ratio of the surface area of the original sphere to the total surface area of the 6 smaller spheres thus formed.
Group D 06/09/2022 (Morning)
(a) 3 : 2 (b) 9 : 4 (c) 9 : 8 (d) 3 : 1

Q.80. If the radius of the base of a right circular cylinder is decreased by 20%, and its height is increased by 125%, then by what percent will its volume increase?
Group D 06/09/2022 (Evening)
(a) 65% (b) 36% (c) 44% (d) 60%

Q.81. In quadrilateralABCD, AB = 17 cm, BC = 8 cm, CD = 9 cm, AD = 12 cm, and AC = 15 cm. Find the area (in cm^2) of quadrilateral ABCD.
Group D 06/09/2022 (Evening)
(a) 114 (b) 110 (c) 140 (d) 144

Q.82. The circumference of the base of a solid right circular cylinder is 136.4 cm and its height is 50 cm. What is the volume (in cm^3) of the cylinder?
(Take $\pi = \frac{22}{7}$)
Group D 08/09/2022 (Morning)
(a) 73997 (b) 63426
(c) 10571 (d) 31713

Q.83. A hollow spherical shell is made of a metal of density 6 g/cm^3. Its internal and external radii are 8 cm and 9 cm respectively. What is the weight (in kg) of the shell (take $\pi = \frac{22}{7}$)?
Group D 08/09/2022 (Morning)
(a) 5.456 (b) 6.642
(c) 4.546 (d) 6.462

Q.84. The volume of a cylinder having height 21 cm and radius 10 cm is:
(Use $\pi = \frac{22}{7}$)
Group D 08/09/2022 (Afternoon)
(a) 9900 cm^3 (b) 6600 cm^3
(c) 8800 cm^3 (d) 7700 cm^3

Q.85. The areas of three adjacent faces of a solid cuboid are 66 cm^2, 108 cm^2 and 198 cm^2. What is the volume (in cm^3) of the cuboid?
Group D 08/09/2022 (Afternoon)
(a) 594 (b) 1188 (c) 1782 (d) 891

Q.86. The total surface area of a cube whose main diagonal length is $16\sqrt{3}$ cm is:

Group D 08/09/2022 (Evening)
(a) 1764 cm^2 (b) 1868 cm^2
(c) 1854 cm^2 (d) 1536 cm^2

Q.87. The volumes of two spheres are in the ratio 216 : 125. The ratio of their surface areas is:
Group D 09/09/2022 (Morning)
(a) 25 : 9 (b) 36 : 25 (c) 9 : 4 (d) 16 : 9

Q.88. Find the surface area of a sphere of radius 3.5 cm.
Group D 09/09/2022 (Afternoon)
(a) 154 cm^2 (b) 210 cm^2
(c) 142 cm^2 (d) 120 cm^2

Q.89. The curved surface area of a cylinder is 1848 cm^2 and its base radius is 19.6 cm.The height of the cylinder is:
Group D 09/09/2022 (Evening)
(a) 13 (b) 14 (c) 15 (d) 17

Q.90. The volume of a sphere having radius 6 cm is:
Group D 12/09/2022 (Morning)
(a) 488 πcm³ (b) 388 π cm³
(c) 288 π cm³ (d) 588 π cm³

Q.91. If the volume of a cube is 512 cm³, then the measure of the main diagonal of the cube will be:
Group D 13/09/2022 (Morning)
(a) 7√3 cm (b) 14√3 cm
(c) 17√3 cm (d) 8√3 cm

Q.92. The surface area of a sphere is 196 π. The volume of the sphere is:
Group D 13/09/2022 (Morning)
(a) $\frac{1372\,\pi}{3}$ cm³ (b) $\frac{1572\,\pi}{3}$cm³
(c) $\frac{1472\pi}{3}$cm³ (d) $\frac{1272\,\pi}{3}$ cm³

Q.93. The total surface area of a solid hemisphere is 42 cm². Its radius (in cm) is: Take π = $\frac{22}{7}$
Group D 13/09/2022 (Evening)
(a) $\frac{7}{\sqrt{11}}$ (b) $\frac{7\sqrt{2}}{\sqrt{22}}$ (c) $\frac{7\sqrt{2}}{\sqrt{11}}$ (d) $\frac{7\sqrt{3}}{\sqrt{22}}$

Q.94. The internal surface area (in m²) of an open cuboidal tank whose internal length, internal breadth, and internal height are given as 6 m, 4 m, and 3 m, respectively, is:
Group D 14/09/2022 (Morning)
(a) 108 (b) 84 (c) 124 (d) 72

Q.95. The volume (in cm³) of a wire of diameter 2 cm and length 7 m is:
Take π = $\frac{22}{7}$
Group D 14/09/2022 (Morning)
(a) 2400 (b) 1200 (c) 1100 (d) 2200

Q.96. Find the cost of tiling the verandah, at the rate of ₹24 per m^2 , if the length and breadth of the verandah are in the ratio 3 : 1 and its perimeter is 40 m.
Group D 14/09/2022 (Afternoon)
(a) ₹ 1,800 (b) ₹ 1,600
(c) ₹ 1,700 (d) ₹ 1,900

Q.97. A cylindrical rod has an outer curved surface area of 2800 cm². If the length of the rod is 100 cm, then the outer radius (in cm) of the rod, correct to two places of decimal, is: Take π = $\frac{22}{7}$
Group D 14/09/2022 (Evening)
(a) 2.45 (b) 5.45 (c) 3.45 (d) 4.45

Q.98. Find the circumference (in m) of the largest circle that can be inscribed in a rectangle whose dimensions are given as 12 m and 7 m. (Take π = $\frac{22}{7}$)
Group D 15/09/2022 (Morning)
(a) 19 (b) 11 (c) 22 (d) 37

Q.99. If the length of the longest diagonal of a closed cube of $10\sqrt{3}$ cm, then its total surface area (in cm^2) is _____.
Group D 15/09/2022 (Morning)
(a) 900 (b) 300 (c) $100\sqrt{3}$ (d) 600

Q.100. The base and the corresponding height of a parallelogram are 10 cm and 6 cm, respectively. The area of the parallelogram (in cm²) is:
Group D 15/09/2022 (Afternoon)
(a) 75 (b) 30 (c) 45 (d) 60

Q.101. The area of a rectangle is 225 cm^2. The length (x) of the rectangle is 4 more than 4 times the breadth (y). The area in terms of a quartic form (in x) is:
Group D 15/09/2022 (Evening)
(a) $x^2 - 4x - 900 = 0$
(b) $x^2 + 4x + 900 = 0$
(c) $x^2 + 4x - 900 = 0$
(d) $x^2 - 4x + 900 = 0$

Q.102. The total surface area (in m²) of a cube, each of whose edges measures 4 m, is:
Group D 16/09/2022 (Morning)
(a) 64 (b) 72 (c) 108 (d) 96

Q.103. The ratio of the lengths of two corresponding sides of two similar triangles is 2 : 1. The ratio of the areas of these two triangles, in the order mentioned, is:
Group D 16/09/2022 (Afternoon)
(a) 3 : 1 (b) $2\sqrt{2}$: 1 (c) 4 : 1 (d) 2 : 1

Q.104. The volumes of two spheres are in the ratio of 27 : 8. The ratio of the surface areas of these spheres, in the order in which they are mentioned here, is _____.
Group D 16/09/2022 (Afternoon)
(a) 4 : 9 (b) 9 : 4 (c) 3 : 2 (d) 2 : 3

Q.105. If the radius of a sphere is halved, then the new volume will become_____the original volume.
Group D 16/09/2022 (Evening)
(a) $\frac{1}{8}$times (b) $\frac{1}{4}$times
(c) 4 times (d) 8 times

Q.106. If the area of a triangle whose base measures 3 cm is 4 cm², then its corresponding height is:
Group D 16/09/2022 (Evening)
(a) $4\frac{1}{3}$ cm (b) $3\frac{2}{3}$ cm
(c) $2\frac{2}{3}$ cm (d) $1\frac{2}{3}$cm

Q.107. If a square has a side of (5x - 8) cm, then the area of the square (in cm²) is:
Group D 16/09/2022 (Evening)
(a) $25x^2$ + 80x + 64 (b) $25x^2$ + 80x - 64
(c) $25x^2$- 80x - 64 (d) $25x^2$- 80x + 64

Q.108. If the curved surface area of a right circular cylinder is 880 cm² and the diameter of its base is 7 cm, then the height (in cm) of the cylinder is _____.
Take π =$\frac{22}{7}$
Group D 17/09/2022 (Morning)
(a) 40 (b) 20 (c) 28 (d) 14

Q.109. 1000 identical small spheres are cast from a sphere of radius 10 cm, with the total volume of the small spheres being equal to the volume of the larger sphere. The diameter (in cm) of each of the small spheres is:
Group D 17/09/2022 (Evening)
(a) 1 (b) 2 (c) 0.5 (d) 3

Q.110. The length of a rectangular park is 22 m more than its breadth. Its area is 1400 m². Its breadth (in m) is:
Group D 17/09/2022 (Evening)
(a) 21 (b) 42 (c) 28 (d) 35

Q.111. if the diameter of a sphere is 12 cm , then find the volume of the sphere
[use $\Pi = \frac{22}{7}$]
Group D 17/09/2022 (Evening)
(a) $907\frac{4}{7}$cm³ (b) 906 $\frac{6}{7}$ cm^3

(c) $905\frac{1}{7}\ cm^3$ (d) $908\ \frac{2}{7}\ cm^3$

Q.112. A closed metallic cylindrical container is 1.05 m high and its base radius is 35 cm. If the metal sheet costs ₹150 per m², then find the cost of the material used in this container.

[Use $\pi = (\frac{22}{7})$]

Group D 18/09/2022 (Morning)
(a) ₹514 (b) ₹462 (c) ₹336 (d) ₹360

Q.113. If the volume of a sphere is divided by its surface area, the result is 9 cm. The radius (in cm) of the sphere is _____

Group D 18/09/2022 (Afternoon)
(a) 27 (b) 81 (c) 4.5 (d) 18

Q.114. An open water drum is in the form of a cylinder. The height of the drum is 7 m and its internal diameter is 21 m. Find the area (in m²) that needs to be painted if one wants to paint the inside of the drum (Take $\pi = \frac{22}{7}$)

Group D 18/09/2022 (Evening)
(a) 462 (b) 577.5 (c) 1155 (d) 808.5

Q.115. If the ratio of the areas of two squares is 2 : 3, then the ratio of the perimeters of these two squares, in the order mentioned, is_____.
Group D 19/09/2022 (Morning)
(a) $\sqrt{2} : 3$ (b) 4 : 9 (c) $2 : \sqrt{3}$ (d) $\sqrt{2} : \sqrt{3}$

Q.116. The radius of the base of a cylinder is increased from 4 cm to 16 cm, but its curved surface area remains unchanged. If the initial height of the cylinder was 4 cm, what will be its new height?
Group D 19/09/2022 (Morning)
(a) 2 cm (b) 1 cm (c) 3 cm (d) 4 cm

Q.117. The volume (in cm^3) of a right circular cone, whose slant height is 28 cm and radius of base is 21 cm is _____ (Take $\pi = \frac{22}{7}$)

Group D 19/09/2022 (Evening)
(a) 30808 (b) $1617\sqrt{7}$
(c) $3234\sqrt{7}$ (d) 38808

Q.118. The length of each edge of a cube is increased by 50%. The percentage increase in the surface area is:
Group D 19/09/2022 (Evening)
(a) 225% (b) 150% (c) 25% (d) 125%

Q.119. A field is in the form of a triangle. Its area is 25000 m² and the length of the base is 500 m. Its height (in m), corresponding to the given base, is_____
Group D 20/09/2022 (Morning)
(a) 200 (b) 175 (c) 50 (d) 100

Q.120. The dimensions of a cuboidal storage space are 20 m, 25 m, and 10 m. How many boxes of dimension 2 m × 1.25 m × 1 m can be kept in it?
Group D 20/09/2022 (Afternoon)
(a) 8000 (b) 2000 (c) 6000 (d) 4000

Q.121. What will be the area (in cm²) of a semicircle whose perimeter is 72 cm ? (Take л = $\frac{22}{7}$)

Group D 20/09/2022 (Evening)
(a) 308 (b) 144 (c) 616 (d) 154

Q.122. Three cubes, each of edge 5 cm are arranged next to each other. The surface area of the resulting cuboid is:
Group D 20/09/2022 (Evening)
(a) 350 cm² (b) 27 cm²
(c) 125 cm² (d) 37.5 cm²

Q.123. A triangle and a parallelogram have the same base and the same area. If the sides of the triangle are 26 cm, 28 cm, and 30 cm and the parallelogram stands on a base of 28 cm, then the height of the parallelogram is:
Group D 20/09/2022 (Evening)
(a) 11 cm (b) 10 cm (c) 12 cm (d) 14 cm

Q.124. If the length of each side of a cube is increased to three times its initial length, then its volume will become_____ times its initial volume.
Group D 22/09/2022 (Morning)
(a) 27 (b) 9 (c) 6 (d) 3

Q.125. A cube each of whose side is 5 cm will have a total surface area of ___ cm^2 ?
Group D 22/09/2022 (Morning)
(a) 80 (b) 120 (c) 150 (d) 60

Q.126. The ratio of the volumes of two cylinders A and B having the radii of their bases as 2 cm and 3 cm, respectively, and having the same height, is:
Group D 22/09/2022 (Afternoon)
(a) 2 : 3 (b) 3 : 2 (c) 4 : 9 (d) 9 : 4

Q.127. 2250 m of wire is used to fence a rectangular plot in three rounds. The length of the plot exceeds the breadth by 5 m. What is the length of the plot?
Group D 26/09/2022 (Afternoon)
(a) 185 m (b) 210 m (c) 215 m (d) 190 m

Q.128. A solid right cylinder having a base of diameter 10 cm and height 2 cm is melted and recast into right cylindrical coins with a base diameter of 1 cm and a 0.2 cm thickness. Find the number of coins that can be made.
Group D 26/09/2022 (Evening)
(a) 1000 (b) 1001 (c) 10,000 (d) 100

Q.129. What is the area of a regular hexagon the length of each of whose sides is 4 cm?
Group D 27/09/2022 (Morning)
(a) $24\sqrt{3}\ cm^2$ (b) $27\sqrt{3}\ cm^2$
(c) $25\sqrt{3}\ cm^2$ (d) $26\sqrt{3}\ cm^2$

Q.130. Six equal cubes, each of side 7 cm, are placed adjacent to each other. The volume of the new solid formed will be:
Group D 27/09/2022 (Afternoon)
(a) 2312 cm^3 (b) 2058 cm^3
(c) 2206 cm^3 (d) 2124 cm^3

Q.131. If the perimeter of a square is 44 cm, then find the perimeter of a circle whose radius is equal to the length of a side of the given square.
Group D 27/09/2022 (Afternoon)
(a) 22π (b) 11π (c) 12π (d) 21π

Q.132. The difference between the total surface area and the lateral surface area of a cube is 4050 $units^2$. Find the length of each side of the cube.
Group D 27/09/2022 (Evening)
(a) 40 units (b) 54 units
(c) 35 units (d) 45 units

Q.133. If the area of the base of a cylinder is 3850 cm^2 and its height is twice the radius of its base, then find the volume of the cylinder. [use $\frac{22}{7}$]

Group D 28/09/2022 (Afternoon)
(a) 269500 cm^3 (b) 235320 cm^3
(c) 245340 cm^3 (d) 201250 cm^3

Q.134. Find the surface area of a sphere having a radius of 9 cm. [use $\pi = \frac{22}{7}$]

Group D 28/09/2022 (Afternoon)
(a) $1013\frac{5}{7}\ cm^2$ (b) $1018\frac{2}{7}\ cm^2$
(c) $1020\frac{4}{7}\ cm^2$ (d) $1010\frac{6}{7}\ cm^2$

Q.135. If a solid sphere of radius 10 cm is melted into 8 spherical solid balls of equal radius, then what will be the surface area of each such ball?

[Use $\pi = \frac{22}{7}$]

Group D 28/09/2022 (Evening)
(a) $319\frac{1}{7}\ cm^2$ (b) $314\frac{2}{7}\ cm^2$
(c) $335\ \frac{5}{7}\ cm^2$ (d) $324\ \frac{3}{7}\ cm^2$

Q.136. If the radius and the height of a cylinder are 7 cm and 15 cm, respectively, then find the volume of the cylinder. [Use$\Pi = \frac{22}{7}$]
Group D 28/09/2022 (Evening)
(a) 2125 cm^3 (b) 2310 cm^3
(c) 2520 cm^3 (d) 2451 cm^3

Q.137. The edges of a cuboid are in the ratio 1 : 2 : 3 and its volume is 1296 cm^3 The surface area of the cuboid is.
Group D 29/09/2022 (Morning)
(a) 748 cm^2 (b) 684 cm^2
(c) 824 cm^2 (d) 792 cm^2

Q.138. If the volume of a sphere is 4851 cm³, then find the radius of the sphere. [Use $\Pi = \frac{22}{7}$]
Group D 29/09/2022 (Afternoon)
(a) 12.5 cm (b) 10.5 cm
(c) 11.5 cm (d) 13.5 cm

Q.139. If the base area of a right circular cylinder is 346.50 cm² and its height is 21 cm, then find its total surface area. [Use $\Pi = \frac{22}{7}$]
Group D 29/09/2022 (Afternoon)
(a) 2145 cm² (b) 2231 cm²
(c) 2079 cm² (d) 2352 cm²

Q.140. A cuboidal hall is 15 m long and 10 m broad. If the sum of the areas of the floor and the ceiling is equal to the sum of the areas of the four walls, then the volume of the hall is:
Group D 29/09/2022 (Evening)
(a) 790 m³ (b) 930m³
(c) 900 m³ (d) 840 m³

Q.141. Using $\pi = \frac{22}{7}$, find the circumference of a circle whose diameter is 38.5 cm.
Group D 29/09/2022 (Evening)
(a) 165 cm (b) 121 cm
(c) 154 cm (d) 170 cm

Q.142. The external length, breadth and depth of a cuboidal iron storage space are 4 m, 3.6 m, and 1.5 m, respectively. It is open at the top. What is the cost (in ₹) of painting its outer surface at the rate of ₹55 per m² ?
Group D 30/09/2022 (Morning)
(a) 1,991 (b) 2,046 (c) 1,936 (d) 2,838

Q.143. The width of a rectangle is one-third of its length. If the perimeter of the rectangle is 64 cm, find the width of the rectangle.
Group D 30/09/2022 (Morning)
(a) 21 cm (b) 24 cm (c) 8 cm (d) 16 cm

Q.144. Find the total surface area of a solid right circular cylinder whose radius of base is 2 cm, and the height is 10 cm.
Group D 30/09/2022 (Morning)
(a) 48л cm² (b) 840000л cm²
(c) 84000π cm² (d) 8.4π cm²

Q.145. The radius of the base of a right circular closed cylinder is 3.5 cm and its total surface area is 269.5 cm². What is the ratio of its height to its diameter? (Take $\pi = \frac{22}{7}$)
Group D 30/09/2022 (Afternoon)
(a) 5 : 7 (b) 7 : 5 (c) 5 : 4 (d) 4 : 5

Q.146. The area of a right-angled triangle, whose base is 24 cm and hypotenuse is 26 cm, is:
Group D 30/09/2022 (Afternoon)
(a) 240 cm² (b) 120 cm²
(c) 130 cm² (d) 312 cm²

Q.147. A toy is made of a solid cube and a solid cuboid. Each side of the cube is 5 cm long, and the cuboid has dimensions given as 5 cm × 2 cm × 8 cm. What is the volume of the toy?
Group D 30/09/2022 (Evening)
(a) 215 cm^3 (b) 250 cm^3
(c) 205 cm^3 (d) 225 cm^3

Q.148. One side of a triangle is 7 metres longer than twice the smallest side. Another side is 5 metres longer than three times the smallest side. If the perimeter of the triangle is 90 metres, find the length of its smallest side.
Group D 30/09/2022 (Evening)
(a) 10 m (b) 9 m (c) 13 m (d) 12 m

Q.149. A solid metallic cuboid of dimensions 9 cm × 32 cm × 48 cm is melted and recast into 8 identical cubes. What is the sum of the lateral surface areas (in cm²) of 5 such cubes?
Group D 30/09/2022 (Evening)
(a) 4320 (b) 3600 (c) 2880 (d) 2160

Q.150. The volume of a right circular cylinder is 814 cm^3. If the radius and the height of the cylinder are equal, find the height (in cm) of the cylinder. (use $\pi = \frac{22}{7}$)
Group D 06/10/2022 (Morning)
(a) $\sqrt[2]{259}$ (b) $2\sqrt[3]{259}$ (c) $\sqrt[3]{259}$ (d) $\sqrt[3]{295}$

Q.151. Find the area of a triangle whose sides measure 42 cm, 36 cm and 34 cm, respectively.
Group D 06/10/2022 (Morning)
(a) 112 $\sqrt{110}$ cm² (b) 56 $\sqrt{110}$ cm²
(c) 14 $\sqrt{55}$ cm² (d) 28 $\sqrt{55}$ cm²

Q.152. A metallic sphere of radius 10.5 cm is melted and then recast into small spheres, each of radius 3.5 cm. Find the number of small spheres thus obtained.
Group D 06/10/2022 (Afternoon)
(a) 72 (b) 32 (c) 30 (d) 27

Q.153. Find the total surface area (in square units) of a hollow hemisphere whose outer radius is 10 units and inner radius is 5 units.
Group D 06/10/2022 (Afternoon)
(a) 225π (b) 425π (c) 375π (d) 325π

Q.154. If the surface area of a sphere is 1144 cm^2, then find its diameter (in cm). (use $\Pi = \frac{22}{7}$)
Group D 06/10/2022 (Evening)
(a) $\sqrt{91}$ (b) 19 (c) $2\sqrt{91}$ (d) $2\sqrt{95}$

Q.155. The area of a triangle is 81 cm^2 and its base is double the corresponding height. This height (in cm) of the triangle is:
Group D 06/10/2022 (Evening)
(a) 18 (b) 9 (c) 81 (d) 10

Q.156. If the volume of a sphere is $\frac{792}{7}$ cm³, then find the radius of the sphere. (Use π = $\frac{22}{7}$ for calculation)
Group D 07/10/2022 (Afternoon)
(a) 3.5 cm (b) 3 cm (c) 2.5 cm (d) 2 cm

Q.157. The perimeter of a right-angled triangle is 80 cm. If the length of its hypotenuse is 34 cm, find the lengths of its other two sides.
Group D 07/10/2022 (Afternoon)
(a) 18 cm, 28 cm (b) 16 cm, 30 cm
(c) 20 cm, 26 cm (d) 14 cm, 32 cm

Q.158. The perimeter of a rhombus is 146 cm and one of its diagonals is 55 cm. Find the area of the rhombus.
Group D 07/10/2022 (Evening)
(a) 2460 cm^2 (b) 1320 cm^2
(c) 2640 cm^2 (d) 1325 cm^2

Q.159. The area of a trapezium is 160 cm² . If the lengths of the parallel sides are 20 cm and 12 cm, respectively, then the perpendicular distance (in cm) between the parallel sides is:
Group D 07/10/2022 (Evening)
(a) 10 (b) 11 (c) 12 (d) 8

Q.160. A capsule is in the shape of a sphere of diameter 3.5 mm. Find the amount of medicine required to fill the

capsule (in mm^3). [Use $\Pi = \frac{22}{7}$, and give your answer correct to 2 places of Decimal.]
Group D 11/10/2022 (Morning)
(a) 22.42 (b) 22.41 (c) 22.46 (d) 22.43

Q.161. The length of a rectangle is 5 cm more than its width. If the area of the rectangle is 215 cm², then the equation to find the width (w) of the rectangle is:
Group D 11/10/2022 (Morning)
(a) $w^2 - 5w - 215 = 0$
(b) $2w^2 - 5w - 215 = 0$
(c) $w^2 + 5w + 215 = 0$
(d) $w^2 + 5w - 215 = 0$

Q.162. 3 solid hemispheres of radius 2 unit each are melted and recast into a single sphere. Find the radius (in given units) of the newly cast single sphere.
Group D 11/10/2022 (Morning)
(a) $\sqrt[3]{12}$ (b) $\sqrt[2]{10}$ (c) 3 (d) $\sqrt[2]{15}$

Q.163. Find area of a triangle whose base measures 126.4 cm and height 54.8 cm.
Group D 11/10/2022 (Afternoon)
(a) 3343.36 cm^2 (b) 9267.72 cm^2
(c) 6926.72 cm^2 (d) 3463.36 cm^2

Q.164. The area of a triangle whose sides measures 10 cm, 12 cm and 14 cm is:
Group D 11/10/2022 (Afternoon)
(a) $32\sqrt{3}\ cm^2$ (b) $25\sqrt{5}\ cm^2$
(c) $30\sqrt{2}\ cm^2$ (d) $24\sqrt{6}\ cm^2$

Q.165. The area of a triangle is 85 cm² and its base is 5 cm. Find the height of the triangle corresponding to this given base.
Group D 11/10/2022 (Evening)
(a) 51 cm (b) 34 cm (c) 24 cm (d) 17 cm

Q.166. The base of the right-angled triangle is 3 m greater than its height. If its hypotenuse is 15 m, then find its area.
Group D 11/10/2022 (Evening)
(a) 84 m² (b) 64 m² (c) 72 m² (d) 54 m²

RRB NTPC CBT - 2 (09/05/2022 to 17/06/2022)

Q.167. The circumference of a circle is given as 308 m. What is the area of the circle? [$Use\ \pi = \frac{22}{7}$]
Level 6 (09/05/2022) Shift 1
(a) 7646 m^2 (b) 7546 m^2
(c) 7556 m^2 (d) 7446 m^2

Q.168. ABCE is a rectangle with AB = 10 cm and BC = 8 cm. O is the centre of the circle touching the three sides AB, BC and CE of the rectangle ABCE. Find the area (in cm^2) of ΔOBC.
Level 6 (09/05/2022) Shift 1
(a) 24 (b) 16 (c) 22 (d) 20

Q.169. The outer radius of a spherical shell is 9 cm and the thickness of the shell is 1 cm. Find the volume of the metal used for the shell (in cubic cm).
(Use $\pi = \frac{22}{7}$)
Level 6 (09/05/2022) Shift 1
(a) $912\frac{2}{3}$ (b) $915\frac{1}{3}$ (c) $909\frac{1}{3}$ (d) $909\frac{3}{5}$

Q.170. The radius of the base of the conical tent is 9 m and its height is 12 m, find the cost of the material needed to make it if it costs ₹100 per πm^2.
Level 6 (09/05/2022) Shift 1
(a) ₹ 14,500 (b) ₹ 13,000
(c) ₹ 15,000 (d) ₹ 13,500

Q.171. A right circular cone is surmounted on a hemisphere. Base radius of the cone is equal to the radius of the hemisphere. The diameter of the hemisphere is 12 cm while the height of the cone is 8 cm. Find the cost of painting the painting the compound object if it costs ₹25 to paint $\pi\ cm^2$.
Level 6 (09/05/2022) Shift 1
(a) ₹ 10,371 (b) ₹ 3,300
(c) ₹ 9,930 (d) ₹ 4,500

Q.172. What is the volume of a hemisphere having radius 3 cm?
Level 6 (09/05/2022) Shift 2
(a) $18\pi\ cm^3$ (b) $9\pi\ cm^3$
(c) $27\pi\ cm^3$ (d) $36\pi\ cm^3$

Q.173. From a rectangular metallic sheet of length 36 cm and breadth 16 cm, three circular plates of radii 6 cm, 4 cm and 2cm are cut out. If the area of the remaining part of the metallic sheet is equal to the area of a square, then find the length of each side of the square (in cm). ($use\ \pi = \frac{22}{7}$)
Level 6 (09/05/2022) Shift 2
(a) 18.6 (b) 18 (c) 19.4 (d) 20

Q.174. If the main diagonal of a cube is 12 cm long, then find the volume of the cube.
Level 6 (09/05/2022) Shift 2
(a) $64\sqrt{3}\ cm^3$ (b) $128\sqrt{3}\ cm^3$
(c) $192\sqrt{3}\ cm^3$ (d) $192\ cm^3$

Q.175. The radius of a sphere and the base radius of cone both are equal to $3\sqrt{2}$ cm. If the surface area of the sphere is the same as the total surface area of the right circular cone, then what is the height of the cone?
Level 6 (09/05/2022) Shift 2
(a) 8 cm (b) $9\sqrt{2}\ cm$ (c) 12 cm (d) $8\sqrt{2}\ cm$

Q.176. The length of the base of a triangle is 6 cm more than the corresponding altitude. If the area of the triangle is 108 cm^2, then find the length of the base of the triangle.
Level 6 (09/05/2022) Shift 2
(a) 12 cm (b) 9 cm (c) 18 cm (d) 27 cm

Q.177. Find the total surface area ($in\ m^2$) of a cone, if its slant height is 32 m and diameter of its base is 48 m.
(use $\pi = \frac{22}{7}$)
Level 4 (10/05/2022) Shift 1
(a) $12077\frac{4}{7}$ (b) 4424
(c) 4224 (d) $12067\frac{4}{7}$

Q.178. A boy walking at the rate of 4 km per hour crosses a square field diagonally in 36 seconds. What is the area (in m^2) of the field?
Level 4 (10/05/2022) Shift 1
(a) 800 (b) $\frac{800}{\sqrt{2}}$ (c) $800\sqrt{2}$ (d) 1600

Q.179. Find the area of an isosceles triangle whose base is 54 cm long and each equal side is 45 cm long.
Level 4 (10/05/2022) Shift 1
(a) 1944 cm^2 (b) 1215 cm^2
(c) 972 cm^2 (d) 1620 cm^2

Q.180. A cylinder is inscribed in a sphere. The radius of the sphere is $\frac{5}{6}$ times the height of the cylinder. What is the ratio of the volume of the cylinder to the volume of the sphere?
Level 4 (10/05/2022) Shift 1
(a) 27 : 50 (b) 72 : 125 (c) 6 : 5 (d) 36 : 25

Q.181. The lengths of the pair of parallel sides of a trapezium are respectively 18 cm and 15 cm and the particular distance between these two sides is 12 cm. What is the area (in cm^2) of the trapezium?
Level 4 (10/05/2022) Shift 1
(a) 297 (b) 396 (c) 198 (d) 99

Q.182. A sphere has a radius of 8 cm. A solid cylinder has a base radius of 4 cm and a height of h cm. If the total surface

area of the cylinder is half of the surface area of the sphere, then find the height of the cylinder.
Level 4 (10/05/2022) Shift 1
(a) 15 cm (b) 12 cm (c) 10 cm (d) 9 cm

Q.183. The area of a square is $81x^2$ + 72x + 16. Find the measure of each side of the square, where x > 0.
Level 4 (10/05/2022) Shift 1
(a) 9x + 2 (b) $(\frac{9x}{2} + 2)$
(c) $2(\frac{9x}{2} + 2)$ (d) $2(\frac{9x}{2} + 1)$

Q.184. The surface area of a sphere is 61600 cm^2. Find the volume of the sphere(in cu m). [use $\pi = \frac{22}{7}$]
Level 5 (12/06/2022) Shift 1
(a) $\frac{4.312}{3}$ (b) 4.312 (c) $\frac{43.12}{3}$ (d) 43.12

Q.185. A circular racing track has been developed in a field. If the difference between the outer circumference and the inner circumference of the racing track is 33 m, then find the width of the track (in m).(Use $\pi = \frac{22}{7}$)
Level 5 (12/06/2022) Shift 1
(a) $5\frac{1}{4}$ (b) $5\frac{3}{4}$ (c) $5\frac{1}{5}$ (d) $4\frac{3}{4}$

Q.186. The length of each edge of a cube is 2.6 cm. What is the total surface area $(in\ cm^2)$ of the cube?
Level 5 (12/06/2022) Shift 1
(a) 39.96 (b) 40.56 (c) 40.76 (d) 40.36

Q.187. A solid metallic sphere of radius 3 cm is melted and drawn into a wire of thickness 4 mm. What is the length of the wire (in m)?
Level 5 (12/06/2022) Shift 1
(a) 9.25 (b) 7.5 (c) 9 (d) 8

Q.188. The area of a rectangle is 453.6 m^2 If its length is 27 m, then what is the perimeter of the rectangle?
Level 5 (12/06/2022) Shift 1
(a) 86.6 m (b) 87.6m (c) 85.4m (d) 89.8m

Q.189. The ratio of the length width and height of a cuboid is 4 : 3 : 5 and the sum of the lengths of all its edges is 144 cm . Find the total surface area of the cuboid.
Level 5 (12/06/2022) Shift 1
(a) 1620 cm^2 (b) 1026 cm^2
(c) 756 cm^2 (d) 846 cm^2

Q.190. The slant height of a right circular cone is 13 cm and the area of the base is $144\Pi cm^2$. Find the volume (in cm^3) of the cone.
Level 5 (12/06/2022) Shift 2
(a) 245 Π (b) 225 Π (c) 240 Π (d) 260 Π

Q.191. A solid metallic cone of diameter 36 cm and height 12 cm is melted and made into identical solid spheres each of radius 3 cm. How many such spheres can be made?
Level 5 (12/06/2022) Shift 2
(a) 38 (b) 34 (c) 36 (d) 32

Q.192. Find the perimeter (in cm) of a square having an area equal to the area of a rhombus, measure of whose diagonals are 8 cm and 16 cm.
Level 5 (12/06/2022) Shift 2
(a) 35 (b) 34 (c) 36 (d) 32

Q.193 The total surface area of a solid hemisphere is $1848cm^2$. What is the length of the diameter of the flat surface of the hemisphere. [Use $\pi = \frac{22}{7}$]
Level 5 (12/06/2022) Shift 2
(a) 14 (b) 35 (c) 28 (d) 21

Q.194. The length and width of a rectangular plot of land are 10.5 m and 8 m, respectively. Find the cost of laying grass in the entire plot at ₹15.25 per square metre.
Level 5 (12/06/2022) Shift 2
(a) ₹1,281 (b) ₹1,293 (c) ₹1,275 (d) ₹1,302

Q.195. A conical tent with base diameter 10 m and height 12 m has been made. An additional 10% cloth is required as wastage in stitching the tent. Find the area of the cloth required (in m^2).
[Use π = 3.14]
Level 5 (12/06/2022) Shift 2
(a) 78.5 π (b) 65 π (c) 60π (d) 71.5 π

Q.196. What will be the perimeter of a quarter circle having a radius of 10 cm ? [use π = 3.14]
Level 2 (13/06/2022) Shift 1
(a) 35.7 cm (b) 51.4 cm
(c) 15.7 cm (d) 25.7 cm

Q.197. The ratio of the radius of the base and the height of a right circular cylinder is 3:2 , and its volume is 19404 cm^3 . What is the curved surface area (in cm^2) of the cylinder?(take $\pi = \frac{22}{7}$)
Level 2 (13/06/2022) Shift 1
(a) 1232 (b) 1848 (c) 1386 (d) 924

Q.198. The area of a base of a conical tomb is $616m^2$ and height is 48m. what is the cost of plastering its curved surface area at Rs 150 per m^2? (Take $\pi = \frac{22}{7}$)
Level 2 (13/06/2022) Shift 1
(a) Rs 300000 (b) Rs 330000
(c) Rs 315000 (d) Rs 360000

Q.199. The length of a rectangular plot is thrice its breadth. If the length of its diagonal is $18\sqrt{10}$ cm, then the perimeter of the rectangle is:
Level 2 (13/06/2022) Shift 1
(a) 108 cm (b) 144cm (c) 72cm (d) 100m

Q.200. A well of radius 2 m is dug 16.8 m deep. The soil taken out of it is spread evenly all around the well to form a 48 cm high embankment. What is the width (in m) of the embankment?
Level 2 (13/06/2022) Shift 1
(a) 8 (b) 10 (c) 9.6 (d) 8.4

Q.201. ABCDEF is a regular hexagon and m($\overline{BE}$) = 14 cm. What is the perimeter of the hexagon?
Level 2 (13/06/2022) Shift 2
(a) 48 cm (b) 30 cm (c) 42 cm (d) 36 cm

Q.202. An equilateral triangle of side 12 cm is inscribed in a circle. What is the area (in cm^2) of the circle ?
Level 2 (13/06/2022) Shift 2
(a) 18Π (b) 48Π (c) 24Π (d) 36Π

Q.203. If the length and the height of a cuboid are 18 m and 12 m respectively, and its volume is 3024 m^3 , then find its breadth (in m).
Level 2 (13/06/2022) Shift 2
(a) 14 (b) 15 (c) 16 (d) 13

Q.204. A tent is cylindrical upto a height of 6 m and conical above it. The diameter of the base is 90 m and the height of the conical part is 28 m. What is the area (in m^2) of canvas used in making it?
Level 2 (13/06/2022) Shift 2
(a) 2905Π (b) 2895Π (c) 2940Π (d) 2925Π

Q.205. The diameter of base of a right circular cone is 20 cm and its slant height is 10.5 cm. What is the curved surface area (in cm^2) of the right circular cone?[Use $\Pi = \frac{22}{7}$]
Level 2 (13/06/2022) Shift 2
(a) 495 (b) 660 (c) 330 (d) 165

Q.206. A lawn in the shape of a rectangle has an area of 7260 m^2 and its side are in the ratio 5 : 3. Its perimeter is equal to

the perimeter of a circular garden. What is the area of the circular garden

(take π = $\frac{22}{7}$)

Level 3 (14/06/2022) Shift 1

(a) 8712 m^2 (b) 9856 m^2

(c) 7260 m^2 (d) 9878 m^2

Q.207. The volume of a solid cone is 96 π cm^3 and its height is 8cm. What is its total surface area (in cm^2)

Level 3 (14/06/2022) Shift 1

(a) 96 π (b) 36 π (c) 37 π (d) 23 π

Q.208. A hundred rupee note measures 15 cm × 8 cm and a bundle of 125 such notes is 2 cm thick. Find the value of the hundred rupees note that can be contained in a box of size 48 cm × 36 cm × 30 cm , if the bundles are tightly packed in it without any empty space.

Level 3 (14/06/2022) Shift 1

(a) 36 Lakhs (b) 33 Lakhs

(c) 30 Lakhs (d) 27 Lakhs

Q.209. A cylindrical bucket of height 150 cm and radius 50 cm is full of water. A person wants to fill spherical balloons of radius 5 cm each with the water in the bucket. How many balloons can he fill completely with the water present in the bucket?

Level 3 (14/06/2022) Shift 1

(a) 2250 (b) 1753 (c) 1456 (d) 1832

Q.210. Find the volume of a cylinder whose base radius is 12.5 cm and whose height is $\frac{4}{5}$ of the base radius.

Level 3 (14/06/2022) Shift 2

(a) 1652.5Π cm^3 (b) 1562.5Π cm^3

(c) 1250Π cm^3 (d) 2441.4Π cm^3

Q.211. A 3200 m long cylindrical copper wire of radius 0.3 mm is melted and recast into a sphere(without wasting any material). What is the surface area (in cm^2) of the sphere?

Level 3 (14/06/2022) Shift 2

(a) 140 Π (b) 144 Π (c) 198 Π (d) 256 Π

Q.212. The difference between the external and internal curved surface area of a 7 cm long cylindrical metallic pipe is 110 cm^2. If the pipe is made of 302.5 cm^3 metal, then find the inner radius of the pipe.(use π = $\frac{22}{7}$)

Level 5 (15/06/2022) Shift 1

(a) 2.2 cm (b) 1.8 cm (c) 1.5 cm (d) 1.6 cm

Q.213. The perimeters of two squares differ by 48 cm. If the side of one square is four times the side of the other square, then find the area of the larger square (in cm^2).

Level 5 (15/06/2022) Shift 1

(a) 256 (b) 289 (c) 196 (d) 225

Q.214. Rohan had a cuboidal box having dimensions of 36cm × 25cm × 20cm. He packed into it as many cubes as possible, each of which has edges 4cm long. How much space will be still left in this box ?

Level 5 (15/06/2022) Shift 1

(a) 680 cm^3 (b) 780 cm^3

(c) 820 cm^3 (d) 720 cm^3

Q.215. Two cylinders have the same volume, but the radius of the base of the second cylinder is 20% less than the radius of the base of the first. How much greater should the height of the second cylinder be in comparison to the height of the first ?

Level 5 (15/06/2022) Shift 1

(a) 55.25% (b) 56.25%

(c) 56.75% (d) 55.75%

Q.216. The ratio of the length, width and height of a cuboid is 60 : 24 : 7 and the length of each of its four space diagonals is 130 cm. What is the volume (in cm^3) of the cuboid?

Level 5 (15/06/2022) Shift 2

(a) 86400 (b) 80640 (c) 80460 (d) 84600

Q.217. The sum of the radius of the base and the height of a solid right circular cylinder is 39 cm. Its total surface area is 1716 cm^2. What is the volume (in cm^3) of the cylinder?(Take Π = $\frac{22}{7}$)

Level 5 (15/06/2022) Shift 2

(a) 4774 (b) 5082 (c) 4928 (d) 4620

Q.218. Two cubes, each having the length of each side as 8 cm, are joined to form a cuboid. What will be the total surface area of the cuboid?

Level 5 (15/06/2022) Shift 2

(a) 704 cm^2 (b) 640 cm^2

(c) 768 cm^2 (d) 576 cm^2

Q.219. The surface area of a sphere is 38.5 cm^2. Find the radius of the sphere. [Use [π = $\frac{22}{7}$]]

Level 5 (15/06/2022) Shift 2

(a) 1.4 cm (b) 1.75 cm

(c) 1.5 cm (d) 1.8 cm

Q.220. The volume of a solid spherical ball was 972πcm^3. It was melted and 27 identical spheres were made with the molten material, leaving no wastage. What is the total surface area of the 27 smaller spheres taken together?

Level 5 (15/06/2022) Shift 3

(a) 810π cm^2 (b) 972π cm^2

(c) 324π cm^2 (d) 648π cm^2

Q.221. The sides to two squares are in the ratio 4 : 3 and the sum of their areas is 225cm^2. Find the perimeter of the smaller square (in cm).

Level 5 (15/06/2022) Shift 3

(a) 48 (b) 30 (c) 44 (d) 36

Q.222. If three solid gold spherical beads of radii 6 cm, 8cm, and 10cm, respectively are melted into one spherical bead, then what is the radius (in cm) of the larger bead ?

Level 5 (15/06/2022) Shift 3

(a) 13 cm (b) 15 cm (c) 12 cm (d) 16 cm

Q.223. The cost of printing a cube on all the external surfaces at the rate of ₹2/ cm^2 is ₹588. Find the volume of the cube (in cm^3)?

Level 5 (15/06/2022) Shift 3

(a) 216 (b) 274.625 (c) 343 (d) 512

Q.224. The total surface area of a hemisphere is 108π cm^2. What is the Volume of the hemisphere?

Level 5 (15/06/2022) Shift 3

(a) 144π cm^3 (b) 54$\sqrt{3}$π cm^3

(c) 216π cm^3 (d) 108$\sqrt{6}$π cm^3

Q.225. The area of rectangle whose length and width are in the ratio 9 : 5 is given as 180 cm^2. Find the perimeter of the rectangle:-

Level 5 (15/06/2022) Shift 3

(a) 56 cm (b) 42 cm (c) 54 cm (d) 70 cm

Q.226. The ratio of the radius of a sphere to the radius of a hemisphere is 4 : 5 respectively. The surface area of the sphere is what percentage more than the curved surface area of the hemisphere ?

Level 2 (16/06/2022) Shift 1

(a) 26% (b) 25% (c) 28% (d) 27%

Q.227. A field is in the shape of a rhombus whose side is 122 m. The length of one of its diagonals is 240 m. What is the area (in m^2) of the field?

Level 2 (16/06/2022) Shift 1

(a) 5280 (b) 1320 (c) 1760 (d) 3080

Q.228. The curved surface area of a solid cylinder is $\frac{2}{3}$ of its total surface area. If the solid cylinder has a total surface area

of 231 cm^2 , then find the volume of the cylinder (in cm^3) . (Use Π = $\frac{22}{7}$)
Level 2 (16/06/2022) Shift 1
(a) 269.5 (b) 348.2 (c) 295.4 (d) 264.8

Q.229. What is the area (in m^2) of a circular path having a uniform width of 3 m surrounding a circular field of diameter 150m?
Level 2 (16/06/2022) Shift 1
(a) 447π (b) 459π (c) 456π (d) 453π

Q.230. Find the volume of a cylinder (in cm^3) if its area of the base is 1386 cm^2 and its height is 30 cm.
Level 2 (16/06/2022) Shift 2
(a) 45810 (b) 41850 (c) 41580 (d) 40815

Q.231. The area of a trapezium is 1792 $cm^2$and the perpendicular between its parallel sides is 28cm. If the length of one of the parallel sides is 72 cm. Then find the length of the other side.
Level 2 (16/06/2022) Shift 2
(a) 48 cm (b) 56 cm (c) 64 cm (d) 84 cm

Q.232. Find the total surface area (in m^2) of a right circular cone whose radius of base is 70 cm and perpendicular height is 240cm. [use π = $\frac{22}{7}$]
Level 2 (16/06/2022) Shift 2
(a) 704 (b) 7.04 (c) 0.704 (d) 70400

Q.233. The circumference of the base of a right circular cylinder is 176 cm and its height is 12 cm. Find the total surface area (in cm^2) of the cylinder.(use π = $\frac{22}{7}$)
Level 2 (16/06/2022) Shift 3
(a) 7640 (b) 7064 (c) 7460 (d) 7040

Q.234. The diagonal of a rectangular plot is 37m and its area is 420 m^2. What is the cost of fencing the plot at ₹37.50 per metre ?
Level 2 (16/06/2022) Shift 3
(a) 3675 (b) 3600 (c) 3525 (d) 3750

Q.235. The length of a rectangular plot is twice its breadth and the length of its diagonal is $6\sqrt{5m}$. The perimeter of the plot is -
Level 3 (17/06/2022) Shift 1
(a) 36m (b) 54m (c) 48m (d) 28m

Q.236. A solid metallic cylindrical rod of radius 1.4 cm and length 24 cm is melted and recast as identical spherical balls of radius 2 mm. How many maximum such balls could be made?
Level 3 (17/06/2022) Shift 1
(a) 4500 (b) 4410 (c) 4450 (d) 4580

Q.237. The total surface area of a solid right circular cylinder of height 9 cm is 704 cm^2. Its volume is 11k cm^3. Find the value of k. (Use$\pi = \frac{22}{7}$).
Level 3 (17/06/2022) Shift 2
(a) 122 (b) 126 (c) 125 (d) 121

Q.238. The length of each side of a regular hexagon is $2\sqrt{3}$ cm. What is the area of the given hexagon?
Level 3 (17/06/2022) Shift 2
(a) 18 cm^2 (b) 54 cm^2
(c) $18\sqrt{3}$ cm^2 (d) $24\sqrt{3}$ cm^2

Q.239. In ΔABC , DE II BC, interesting AB at D and AC at E. AD : BD :: 2 : 3 and the area of trapezium BDEC is 63 cm^2. What is the area of ΔADE?
Level 3 (17/06/2022) Shift 2
(a) 14 cm^2 (b) 12 cm^2
(c) 28 cm^2 (d) 42 cm^2

Q.240. The cost of cultivating a square field at the rate of ₹ 320 per hectare is ₹ 2880. Find its area (Use 1 hectare = 10000 m²)
Level 3 (17/06/2022) Shift 3
(a) 60000 m^2 (b) 70000 m^2
(c) 80000 m^2 (d) 90000 m^2

Q.241. Find the cost of painting all surfaces of a 10 m long hollow steel pipe whose internal and external diameters measure 15 cm and 17 cm respectively, if the cost of painting 1 cm^2 of the surface is ₹ 0.15. [Use$\pi = \frac{22}{7}$]
Level 3 (17/06/2022) Shift 3
(a) ₹ 15100.80 (b) ₹ 15000.80
(c) ₹ 15200.80 (d) ₹ 15160.80

RRB NTPC CBT - 1
(28/12/2020 to 31/07/2021)

Q.242. The total cost of flooring a room at Rs.12.50 per m² is Rs.3,675. If the breadth and length are in the ratio of 2 : 3, find its length.
RRB NTPC 29/12/2020 (Morning)
(a) 21 m (b) 15 m (c) 14 m (d) 18 m

Q.243. A cylindrical tank has a capacity of 6160 m³. If the diameter of the base of the tank is 28 m, then the depth of the tank (in m) is
RRB NTPC 29/12/2020 (Evening)
(a) 12 (b)14 (c) 8 (d) 10

Q.244. The base of an isosceles triangle is 8 cm and one of its equal sides is 5 cm. The height of the vertex opposite to the base from the base is:
RRB NTPC 30/12/2020 (Morning)
(a) 5 cm (b) 3 cm (c) 2 cm (d) 4 cm

Q.245. Find the length of the longest pole that can be placed in a room of dimensions 30 m × 15 m × 10 m.
RRB NTPC 30/12/2020 (Morning)
(a) 33 m (b) 18 m (c) 31 m (d) 35 m

Q.246. A cuboid having the surface area of 3 adjacent faces as a, b, c has the volume
RRB NTPC 30/12/2020 (Morning)
(a) $a^3b^3c^3$ (b) $(abc)^{\frac{1}{3}}$ (c) abc (d) $(abc)^{\frac{1}{2}}$

Q.247. The length, breadth and height of a cuboid are 27cm, 18cm and 21cm. How many cubes of side 3cm can be cut from the cuboid ?
RRB NTPC 30/12/2020 (Evening)
(a) 368 (b) 378 (c) 278 (d) 738

Q.248. If the length and breadth of a rectangular plot of land are increased by 10% and 8% respectively, then by how much percentage will the area increase or decrease?
RRB NTPC 30/12/2020 (Evening)
(a) 16.8% decrease (b) 18.8% decrease
(c) 18.8% increase (d) 16.8% increase

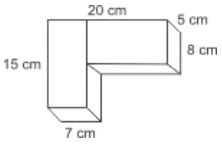
Q.249. A man walks around a circular pond exactly once. If his step is 44 cm long and he takes 700 steps to go around the pond. Find the area of the pond?
RRB NTPC 30/12/2020 (Evening)
(a) 6574m^2 (b) 7456m^2
(c) 6546m^2 (d) 7546m^2

Q.250. There is a carpet of length $20\frac{5}{2}m$. How many small pieces of carpet, each of length $4\frac{1}{2}$m , can it be cut out of it ?
RRB NTPC 04/01/2021 (Morning)
(a) 8 (b) 9 (c) 5 (d) 7

Q.251. If the area of a circle is 154 cm^2, then the circumference of the circle is
RRB NTPC 04/01/2021 (Morning)
(a) 44 cm (b) 22 cm (c) 36 cm (d) 11 cm

Q.252. How many straight lines does a cuboid have ?
RRB NTPC 04/01/2021 (Evening)
(a) 10 (b) 12 (c) 16 (d) 24

Q.253. What is the total surface area of the visible faces in the given figure?



RRB NTPC 05/01/2021 (Morning)
(a) $384\ cm^2$ (b) $905\ cm^2$
(c) $580\ cm^2$ (d) $1325\ cm^2$

Q.254. If the dimensions of a room are 2m, 3m and 4m, then how many cubes of size $\frac{1}{2}$ m × $\frac{1}{3}$ m ×$\frac{1}{4}$ m can be placed in the same room?
RRB NTPC 05/01/2021 (Morning)
(a) 676 (b) 760 (c) 576 (d) 672

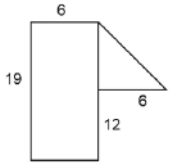
Q.255. A cylinder and a cone are of the same base radius and the same height. Find the ratio of the volume of the cylinder to that of the cone.
RRB NTPC 05/01/2021 (Evening)
(a) 3 : 1 (b) 2 : 1 (c) 1 : 3 (d) 1 : 2

Q.256. If the radius of a sphere is doubled, what will be the ratio of the volume of the new sphere to that of the original sphere?
RRB NTPC 05/01/2021 (Evening)
(a) 8 : 1 (b) 2 : 1 (c) 1 : 8 (d) 1 : 2

Q.257. A sector is cut off from a circle of radius 21 cm. The angle of the sector is 40 degrees. Find the area of the sector in square cm ?
RRB NTPC 07/01/2021 (Morning)
(a) 156 (b) 154 (c) 144 (d) 145

Q.258. When the side of an equilateral triangle is made three times the original side, the area of the new equilateral will become:
RRB NTPC 07/01/2021 (Morning)
(a) 3 times of the original area
(b) 6 times of the original area
(c) 9 times of the original area
(d) 12 times of the original area

Q.259. What is the area of the compound shape ?



RRB NTPC 07/01/2021 (Evening)
(a) 135 square units (b) 21 units
(c) 114 units (d) 114 square units

Q.260. The floor of a hall measuring 16 meters in length and 12 meters in width is to be paved with square tiles. If the least number of tiles are to be used, then what is the length of each square tile?
RRB NTPC 08/01/2021 (Morning)
(a) 12 meters (b) 24 meters
(c) 48 meters (d) 4 meters

Q.261. The area of triangle ABC is 39 cm^2. D and E are two points on BC such that BD = DE = EC, then what is the area of triangle ADC?
RRB NTPC 08/01/2021 (Morning)
(a) 26 cm^2 (b) $\frac{9}{4}$ cm^2
(c) 13 cm^2 (d) 52 cm^2

Q.262. The diagonal of a square is $\sqrt{200}$ cm. If the sides of a rectangle are in the ratio 5:2, which is the same as the area of the square, then what is the length of the rectangle?
RRB NTPC 08/01/2021 (Morning)
(a) $2\sqrt{10}$ cm (b) $\sqrt{250}$ cm
(c) $\sqrt{200}$ cm (d) $\sqrt{20}$ cm

Q.263. The radius of a spherical balloon increases from 5 cm to 10 cm when more air is pumped into it. The ratio of the surface area of the original balloon and that of the inflated balloon is:
RRB NTPC 09/01/2021 (Evening)
(a) 1: 2 (b) 1 : 4 (c) 2 :1 (d) 1 : 8

Q.264. A solid metallic cylinder of base radius 3 cm and height 5 cm is melted into cones each of height 1 cm and base radius 1 mm. How many cones are formed?
RRB NTPC 10/01/2021 (Evening)
(a) 12,500 (b) 19,500 (c) 10,500 (d) 13,500

Q.265. The dimensions of a metallic cuboid are 50 cm × 40 cm × 32 cm. The cuboid is melted and recast into a cube. Find the surface area of the cube.
RRB NTPC 11/01/2021 (Morning)
(a) $8,350\ cm^2$ (b) $7,150\ cm^2$
(c) $8,700\ cm^2$ (d) $9,600\ cm^2$

Q.266. Find the volume of the largest sphere that can be carved out of a cube of side 21cm.
RRB NTPC 11/01/2021 (Morning)
(a) 5841 cm^3 (b) 4158 cm^3
(c) 4851cm^3 (d) 8514 cm^3

Q.267. A hollow metallic sphere has an internal and external radius of 3cm and 5 cm respectively. It is melted and recast as a solid cylinder with radius 7cm. What is the height of the cylinder ?
RRB NTPC 11/01/2021 (Evening)
(a) 8 cm (b) $\frac{2}{3}$cm (c) 3 cm (d) $\frac{8}{3}$cm

Q.268. The perimeter of a rhombus is 120 m and the distance between any two parallel sides is 15 m. The area of the rhombus is:
RRB NTPC 12/01/2021 (Morning)
(a) 450 m^2 (b) 4.5 m^2 (c) 45 m^2 (d) 450 cm^2

Q.269. The Semicircle of area 1250 π cm² is inscribed inside a rectangle. The diameter of the semicircle coincides with the length of the rectangle. The area of the rectangle is.
RRB NTPC 13/01/2021 (Morning)
(a) 5000 cm^2 (b) 2000 cm^2
(c) 4000 cm^2 (d) 3000 cm^2

Q.270. A solid sphere of surface area S, is cut into four equal pieces by two radial planes. The total surface area of all the pieces:
RRB NTPC 13/01/2021 (Morning)
(a) becomes 4S (b) becomes 3S
(c) becomes 2S (d) remains S

Q.271. 500 persons are taking a dip in a cuboidal pond, which is 80 m long and 50 m broad. What is the rise in the water level in the pond, if the average displacement of the water by one person is 0.04 m^3 ?
RRB NTPC 13/01/2021 (Evening)
(a) 0.5 cm (b) 1 cm (c) 2.5 cm (d) 1.5 cm

Q.272. If two cubes, each with a side of 10 cm, are joined end to end, then find the surface area of the resulting cuboid.
RRB NTPC 13/01/2021 (Evening)
(a) 1000 cm^2 (b) 100 cm^2
(c) 500 cm^2 (d) 300 cm^2

Q.273. If three cubes whose edges measure 3 cm, 4 cm and 5 cm respectively, are melted to form a single cube, then find the edge of the new cube.
RRB NTPC 16/01/2021 (Morning)
(a) 4cm (b) 7cm (c) 6cm (d) 5cm

Q.274. A glass cylinder with diameter 20 cm has water to a height of 9 cm. A metal cube of 8 cm edge is immersed in it completely. Calculate the height (correct to 1 decimal place) by which the water will rise in the cylinder (by taking $\pi = 3.142$)
RRB NTPC 16/01/2021 (Morning)
(a) 1.4 cm (b) 1.6 cm (c) 2.6 cm (d) 2 cm

Q.275. The area of a square field is 7200 m^2. How long will a cycle take to cross the field diagonally at a constant rate of 4 km/h?
RRB NTPC 16/01/2021 (Evening)

(a) $\frac{9}{5}$ minutes (b) 30 minutes
(c) 25 minutes (d) 5 minutes

Q.276. Find the total surface area of a cone, if its radius and slant height are 2r and $\frac{1}{2}$ respectively.
RRB NTPC 17/01/2021 (Morning)
(a) π $(4r^2 + 1)$ (b) $\frac{4r^2+1}{2}$
(c) πr (4r + 1) (d) πr(2r + 1)

Q.277. The area of the greatest circle that can be inscribed inside a square of side 21 cm is:
RRB NTPC 17/01/2021 (Evening)
(a) $347cm^2$ (b) $351.5cm^2$
(c) $346.5cm^2$ (d) $350.5cm^2$

Q.278. The floor of a hall is rectangular. Its length is 30m and breadth is 24 m. How many carpets of size 6m × 4m are required to cover it?
RRB NTPC 17/01/2021 (Evening)
(a) 24 carpets (b) 36 carpets
(c) 28 carpets (d) 30 carpets

Q.279. If the length of a rectangular solar panel having an area of 110 m^2 is 10% more than its breadth, then what will be the breadth.
RRB NTPC 18/01/2021 (Morning)
(a) 10 m (b) $10\sqrt{3}\ m$ (c) $20\sqrt{3}\ m$ (d) 110 m

Q.280. If the outer and inner radii of a circular path are 2a and b, then its area is _____sq units.
RRB NTPC 18/01/2021 (Morning)
(a) $(-4a^2 + b^2)$ (b) $\Pi(-4a^2 + b^2)$
(c) $\Pi(4a^2 - b^2)$ (d) $(4a^2 - b^2)$

Q.281. If the radius of a sphere is 21 cm, what will be its volume?
RRB NTPC 18/01/2021 (Evening)
(a) 3500 cm^3 (b) 3800 cm^3
(c) 37050 cm^3 (d) 38808 cm^3

Q.282. What will be the area of a parallelogram with base 44 cm and height 22 cm?
RRB NTPC 18/01/2021 (Evening)
(a) 968 cm^2 (b) 988 cm^2
(c) 958 cm^2 (d) 978 cm^2

Q.283. The area of a circular park is 1386 m^2. If a path of the width 7 m is laid around and inside the park. Then the area of the path is..
RRB NTPC 19/01/2021 (Morning)
(a) 790 m^2 (b) 770 m^2
(c) 780 m^2 (d) 760 m^2

Q.284. If the radii of two cylinders are in ratio 2 : 3 and their respective heights are in ratio 5 : 3 then what is the ratio of their volumes?
RRB NTPC 19/01/2021 (Evening)
(a) 10 : 17 (b) 17 : 27 (c) 20 : 27 (d) 20 :37

Q.285. What will be the area of the ring-shaped region enclosed between two concentric circles of radii 14 cm and 7 cm?
RRB NTPC 20/01/2021 (Morning)
(a) $98cm^2$ (b) $147cm^2$
(c) $462cm^2$ (d) 245 cm^2

Q.286. The ratio of the area of a circle and that of an equilateral triangle, where the diameter of a circle is equal to the sides of the equilateral triangle is.
RRB NTPC 20/01/2021 (Evening)
(a) $\Pi : \sqrt{2}$ (b) $\Pi : \sqrt{3}$ (c) $\Pi : 1$ (d) $3 : \Pi$

Q.287. A photograph of bacteria enlarged 60000 times attains a length of 6 cm. The actual length of bacteria is:
RRB NTPC 20/01/2021 (Evening)
(a) $\frac{1}{100}cm$ (b) $\frac{1}{10000}cm$
(c) 1000 cm (d) $\frac{1}{1000}cm$

Q.288. The ratio of the volumes of two cubes is 64 : 1331. What is the ratio of their total surface areas?
RRB NTPC 21/01/2021 (Morning)
(a) 16 : 121 (b) 121 : 16
(c) 16 : 4 (d) 4 : 121

Q.289. A sector of a circle has a radius of 18 cm and a central angle of 125°. What will be its approximate perimeter?
(Use π = $\frac{22}{7}$)
RRB NTPC 21/01/2021 (Morning)
(a) 74 cm (b) 73.85 cm
(c) 73 cm (d) 75.3 cm

Q.290. The angle of elevation of ladder leaning against a wall is 45°. The foot of the ladder is $4\sqrt{2}$ meters away from the wall. The length of the ladder is:
RRB NTPC 21/01/2021 (Morning)
(a) 7 m (b) 5 m (c) 6 m (d) 8 m

Q.291. The diameters of the bases of the two cones are equal. If their slant heights are in the ratio of 3 : 4, then what will the ratio of their curved surface areas be?
RRB NTPC 22/01/2021 (Morning)
(a) 9 : 16 (b) 4 : 3 (c)16 : 9 (d) 3 : 4

Q.292. The diameter of a hemisphere is 7 cm. What will be its total surface area?
RRB NTPC 22/01/2021 (Morning)
(a) 154 cm^2 (b) 105.50 cm^2
(c) 77 cm^2 (d) 115.50 cm^2

Q.293. If a map of a city was drawn on a scale of 0.05 centimetres to a kilometre, what area would represent a country if it has an area of 8000 square kilometres?
RRB NTPC 22/01/2021 (Morning)
(a) 10 cm^2 (b) 5 cm^2 (c) 20 cm^2 (d) 25 cm^2

Q.294. Area of a square is equal to ten times the area of a rectangle of edge 5 cm × 8 cm. What is the Perimeter of the square ?
RRB NTPC 22/01/2021 (Evening)
(a) 120 cm (b) 80 cm (c) 60 cm (d) 40 cm

Q.295. Which of the four options provided below will be the closest to the area of an equilateral triangle, each of whose sides is 10 m long ?
RRB NTPC 23/01/2021 (Morning)
(a) 42.25 m^2 (b) 45.25 m^2
(c) 43.25 m^2 (d) 44.25 m^2

Q.296. There are 3 pieces of wooden logs which are 48 m, 56 m and 72 m long. What is the greatest possible length by which these can be completely measured ?
RRB NTPC 23/01/2021 (Morning)
(a) 9 m (b) 7 m (c) 11 m (d) 8 m

Q.297. The area of a square is 36 cm^2. Find the area of the square formed by joining the mid-points of its sides.
RRB NTPC 25/01/2021 (Morning)
(a)18 cm^2 (b) 25 cm^2 (c) 28 cm^2 (d) 20 cm^2

Q.298. 784 square tiles, each of side 50 cm are required to tile a floor of a square room. Find the length of the sides of the room.
RRB NTPC 25/01/2021 (Morning)
(a) 13 m (b) 12 m (c) 15 m (d) 14 m

Q.299. The cost of fencing a rectangular field at Rs. 24 per meter is Rs. 1,920. If its length is 23 m, Find its breadth.
RRB NTPC 25/01/2021 (Morning)
(a) 17 m (b) 18 m (c) 20 m (d) 19 m

Q.300. The ratio of the length to the breadth of a rectangular field is 6 : 5. If the breadth is 25 m less than the length. The perimeter of the field is ?
RRB NTPC 25/01/2021 (Evening)
(a) 530 m (b) 550 m (c) 560 m (d) 540 m

Q.301. The ratio of the area of an equilateral triangle of side x to the area of a square of side x is ?
RRB NTPC 25/01/2021 (Evening)

(a) $\sqrt{3}$: 1 (b) $\sqrt{3}$: 2 (c) $\sqrt{3}$: 8 (d) $\sqrt{3}$: 4

Q.302. A rectangular field is to be fenced on three sides leaving a side of 30 ft. uncovered. If the area of the field is 690 sq . ft. how many feet of fencing will be required ?
RRB NTPC 27/01/2021 (Morning)
(a) 46 (b) 59 (c) 76 (d) 69

Q.303. The ratio of the length to the breadth of a rectangular field is 7 : 6. If the breadth is 35 m less than the length, then the perimeter of the field is :
RRB NTPC 27/01/2021 (Morning)
(a) 910 m (b) 930 m (c) 940 m (d) 920 m

Q.304. Find the cost of fencing a square plot of land with an area of 11025 m^2, at the rate of Rs. 85 per metre.
RRB NTPC 27/01/2021 (Evening)
(a) Rs. 35,800 (b) Rs. 35,000
(c) Rs. 36,000 (d) Rs. 35,700

Q.305. A cord is in the form of a square enclosing an area of 22 cm². If the same cord is formed into a circle, then find the area enclosed by the circle. [Take π = $\frac{22}{7}$]
RRB NTPC 27/01/2021 (Evening)
(a) 26 cm^2 (b) 20 cm^2
(c) 28 cm^2 (d) 30 cm^2

Q.306. If one envelope requires a paper size of 18 cm × 12 cm, then how many envelopes can be made out of a sheet of paper of size 72 cm × 48 cm?
RRB NTPC 27/01/2021 (Evening)
(a) 16 (b) 4 (c) 8 (d) 12

Q.307. The area of trapezium is 540 m^2. If the parallel sides are 30 m and 24 m in length, then find the distance between them.
RRB NTPC 27/01/2021 (Evening)
(a) 20 m (b) 22 m (c) 24 m (d) 25 m

Q.308. Find the area of a trapezium whose parallel sides are 10cm and 20 cm and non parallel sides are equal to 10 cm.
RRB NTPC 28/01/2021(Morning)
(a) $70\sqrt{3}\ cm^2$ (b) $75\sqrt{3}\ cm^2$
(c) $60\sqrt{3}\ cm^2$ (d) $65\sqrt{3}\ cm^2$

Q.309. The radius of a 80 cm wide road roller is 77cm . Find the number of revolutions that the roller will take to cover an area of 96.8 m^2. [$Take\ \pi = \frac{22}{7}$]
RRB NTPC 28/01/2021(Morning)
(a) 25 (b) 20 (c) 24 (d) 22

Q.310. If the total surface area of a cube is 864 m^2, then its volume is :
RRB NTPC 28/01/2021 (Evening)
(a) 1728 m^3 (b) 1727 m^3
(c) 1726 m^3 (d) 1729 m^3

Q.311. A cylinder and a cone have the same height and the same radius as that of their base. The ratio of the volume of the cone to the volume of the cylinder is:
RRB NTPC 28/01/2021 (Evening)
(a) 3 : 2 (b) 1 : 3 (c) 3 : 1 (d) 2 : 3

Q.312. How many cubes of side 3 cm can be formed by melting a cuboid of length 9 cm, breadth 6 cm , and height 6 cm ?
RRB NTPC 29/01/2021 (Morning)
(a) 13 (b) 12 (c) 11 (d) 14

Q.313. In a building, there are 24 cylindrical pillars. The radius of each pillar is 28 cm and height is 4 m. Find the total cost of painting the curved surface area of all the pillars at the rate of Rs 8 per m^2 ?
RRB NTPC 29/01/2021 (Morning)
(a) Rs.1,352.98 (b) Rs.1,354.78
(c) Rs.1,350.45 (d) Rs.1,351.68

Q.314. 3 cubes each with a side 16 cm are joined side by side in a line. Find the surface area of the cuboid so formed.
RRB NTPC 30/01/2021 (Morning)
(a) 3588 cm^2 (b) 3600 cm^2
(c) 3584 cm^2 (d) 3564 cm^2

Q.315. If the height and the radius of a solid right circular cylinder are doubled, Find the percentage increase in its volume.
RRB NTPC 30/01/2021 (Morning)
(a) 700% (b) 600% (c) 400% (d) 300%

Q.316. The internal measures of a cuboidal room are 12 m, 8 m, 4 m with the height being 4 m. Find the total cost of whitewashing all four walls along with the ceiling of the room, if the cost of white washing is Rs 5 per sq m ?
RRB NTPC 30/01/2021 (Evening)
(a) Rs 1180 (b) Rs 1380
(c) Rs 1080 (d) Rs 1280

Q.317. If the volume of a sphere is given as 4851cm^3, then find its diameter.
(Use π = $\frac{22}{7}$)
RRB NTPC 31/01/2021 (Morning)
(a) 10.5 cm (b) 42 cm (c) 28 cm (d) 21 cm

Q.318. An aquarium is in the form of a cuboid whose external measures are 80 cm × 30 cm × 40 cm. The base, side faces and back face are to be covered with a coloured paper. Find the area of the paper needed ?
RRB NTPC 31/01/2021 (Evening)
(a) 6000 cm^2 (b) 8000 cm^2
(c) 8050 cm^2 (d) 8080 cm^2

Q.319. Find the number of bricks measuring 25 cm in length , 5 cm in breadth and 20 cm in height for a wall 40m long, 80 cm broad and 6 m in height.
RRB NTPC 31/01/2021 (Evening)
(a) 75898 (b) 78986 (c) 76800 (d) 74524

Q.320. What is the ratio of volumes of two spheres where the curved surface areas are in the ratio of 1 : 4 ?
RRB NTPC 01/02/2021 (Evening)
(a) 1 : 4 (b) 8 : 1 (c) 1 : 8 (d) 8 : 13

Q.321. A path around the inner side of a rectangular park measuring 37m × 30m occupies 570 m^2. What is the width of the path ?
RRB NTPC 01/02/2021 (Evening)
(a) 10 m (b) 15 m (c) 5 m (d) 28 m

Q.322. A cube of volume 324 cm^3 is molded into a cuboid whose length, width and height are in the ratio 3 : 2 : 2. Find the length of the cuboid.
RRB NTPC 02/02/2021 (Evening)
(a) 6 cm (b) 12 cm (c) 9 cm (d) 7.5 cm

Q.323. The ratio of an interior angle to the exterior angle of a regular polygon is 4 : 1. The number of sides of the polygon is:
RRB NTPC 03/02/2021 (Morning)
(a) 12 (b) 10 (c) 5 (d) 6

Q.324. If the ratio of the heights of two cones is 1 : 4 and the diameters are in the ratio 4 : 5 then what is the ratio of their volumes ?
RRB NTPC 03/02/2021 (Evening)
(a) 4 : 25 (b) 13 : 25 (c) 7 : 17 (d) 5 : 9

Q.325. If the length ,breadth and height of a room are 20m, 25m and 35m. respectively, then what will be the total surface area of the four walls of the room ?
RRB NTPC 04/02/2021 (Morning)
(a) 3145m^2 (b) 3140m^2
(c) 3150m^2 (d) 3155 m^2

Q.326. In a right circular cylinder, the ratio of the curved surface area to the total surface area is 5 : 9. Find the ratio of the height of the cylinder to the radius of the cylinder.
RRB NTPC 04/02/2021 (Morning)

(a) 3 : 5 (b) 5 : 4 (c) 4 : 5 (d) 5 : 3

Q.327. Flooring of a room 12 m long and 8 m wide is to be designed by squares of the maximum possible area. Find the number of square designs required.
RRB NTPC 04/02/2021 (Evening)
(a) 5 (b) 6 (c) 8 (d) 4

Q.328. In a polygon, the sum of the interior angles is triple the sum of the exterior angles. The number of sides is:
RRB NTPC 04/02/2021 (Evening)
(a) 8 (b) 7 (c) 6 (d) 9

Q.329. A rectangle has 15 cm as its length and 150 cm^2 as its area, If the area is increased to $1\frac{1}{3}$times the original area by increasing its length only. Then the new perimeter is:
RRB NTPC 05/02/2021 (Morning)
(a) 70 cm (b) 60 cm (c) 80 cm (d) 50 cm

Q.330. The area of a rectangle is 1287 $cm^2$and length and breadth are in the ratio 13 : 11 respectively. What is its perimeter ?
RRB NTPC 08/02/2021 (Morning)
(a) 140 cm (b) 144 cm
(c) 142 cm (d) 138 cm

Q.331. A maximum of how many pieces of exact 17 cm length can be cut from a 960 cm long rod ?
RRB NTPC 08/02/2021 (Morning)
(a) 56 (b) 58 (c) 60 (d) 54

Q.332. If the base of the cylinder is the same as that of a cone, and the height of the cylinder is also the same as that of the cone, then find the ratio of the volumes of the cylinder and the cone.
RRB NTPC 08/02/2021 (Evening)
(a) 1 : 3 (b) 3 : 2 (c) 2 : 3 (d) 3 : 1

Q.333. The dimensions of an ice compartment in a refrigerator $8cm \times 5cm \times 4cm$ How many ice cubes will it hold, if each ice cubes is 2 cm on its edge?
RRB NTPC 09/02/2021 (Morning)
(a) 40 (b) 80 (c) 20 (d) 24

Q.334. When a wire is bent into the shape of a square, the area of the square is 81 cm^2. When the wire is bent into a semicircular shape , what will be the area of the semicircle? [take $\pi = \frac{22}{7}$]
RRB NTPC 10/02/2021 (Morning)
(a) 77 cm^2 (b) 11 cm^2
(c) 77 m^2 (d) 7 cm^2

Q.335. Between a square of perimeter 44 cm and a circle of circumference 44 cm, which figure has a larger area and by how much?
RRB NTPC 10/02/2021 (Morning)
(a) Square , 34 cm^2 (b) Circle , 23 cm^2
(c) Square , 33cm^2 (d) Circle, 33cm^2

Q.336. If a triangle and a parallelogram are on the same base and between the same parallels, then the area of the triangle is equal to:
RRB NTPC 10/02/2021 (Evening)
(a) the area of the parallelogram
(b) three-fourth of the area of the parallelogram
(c) half the area of the parallelogram
(d) one - third of the area of the parallelogram

Q.337. The perimeters of five squares are 24cm, 32cm, 40cm, 76cm and 80cm respectively. The perimeter of another square whose area is equal to the sum of the areas of these squares will be:
RRB NTPC 10/02/2021 (Evening)
(a) 120 cm (b) 128 cm
(c) 124 cm (d) 100 cm

Q.338. The minute hand of a watch is 1.5 cm long. How far does its tip move in 40 minutes? (Take π = 3.14)
RRB NTPC 10/02/2021 (Evening)
(a) 6.28 cm (b) π cm (c) 6.00 cm (d) 2π m

Q.339. If the side of a square is $\frac{1}{10}$m, then how many such squares will get accommodated in a bigger square of side 4 m?
RRB NTPC 10/02/2021 (Evening)
(a) 1200 (b) 1650 (c) 1500 (d) 1600

Q.340. The breadth of a rectangular plot of land is one third of its length. If the perimeter of the plot is 240 m, then what is the length of the plot?
RRB NTPC 11/02/2021 (Morning)
(a) 70 m (b) 60 m (c) 90 m (d) 95 m

Q.341. If a circle has a radius of 4 cm then the area of the largest square that would fit inside the entire circle would be _____.
RRB NTPC 11/02/2021 (Evening)
(a) 64 cm^2 (b) 16 cm^2
(c) 30 cm^2 (d) 32 cm^2

Q.342. Let 30 cm and 18 cm be the lengths of the two parallel sides of a trapezium and 24 cm, be distance between these two sides. If the area of this trapezium is equal to the area of a square, then the perimeter of the square will be:
RRB NTPC 12/02/2021 (Morning)
(a) 87 cm (b) 66 cm (c) 96 cm (d) 75 cm

Q.343. The paint in a container is sufficient to paint an area equal to 9.375 m^2. How many bricks, each measuring 22.5 cm x 10 cm x 7.5 cm can be painted with the paint in the container?
RRB NTPC 12/02/2021 (Morning)
(a) 170 (b) 120 (c) 100 (d) 150

Q.344. The altitudes of two similar triangles are 4 cm and 6 cm. If the area of the larger triangle is 36 cm^2.what will be the area of the other one?
RRB NTPC 12/02/2021 (Morning)
(a) 16 cm^2 (b) 36 cm^2
(c) 49 cm^2 (d) 25 cm^2

Q.345. There is a rectangular field of dimensions 100 m and 80 m respectively. If a path of uniform width 10 m runs around and inside it, then the area of path will be.
RRB NTPC 12/02/2021 (Morning)
(a) 3400 m^2 (b) 3800 m^2
(c) 3200 m^2 (d) 3500 m^2

Q.346. ABC is a right -angled triangle .If the lengths of two sides containing the right angle are 4 cm and 3 cm. The radius of its incircle is:
RRB NTPC 15/02/2021 (Morning)
(a) 1 cm (b) 4 cm (c) 2 cm (d) 3cm

Q.347. An object is in the form of a trapezium with height 5 m and parallel sides being 4 m and 6 m. What is the cost of painting the object if the rate of painting is Rs. 50 per square meter.
RRB NTPC 15/02/2021 (Morning)
(a) Rs.1,250/- (b) Rs.800/-
(c) Rs.1,000/- (d) Rs.1,200/-

Q.348. Calculate the total surface area of a cone if the radius is $\frac{r}{4}$ and its slant height is $4l$.
RRB NTPC 15/02/2021 (Evening)
(a) $2\Pi\, r(l + r)$ (b) $2\Pi\, r$l
(c) $\pi r(4l + \frac{r}{16})$ (d) $\Pi\, r(l + r)$

Q.349. A large cube is formed by melting three smaller cubes of sides 3 cm, 4 cm and 5 cm each. The ratio of the surface areas of the three smaller cubes together to the large cube is.
RRB NTPC 17/02/2021 (Morning)
(a) 25 : 18 (b) 27 ; 64 (c) 18 : 25 (d) 9 : 4

Q.350. The perimeter of the floor of a room is 18 m. What is the area of the

walls of the room, if the height of the room is 3 m?
RRB NTPC 22/02/2021 (Morning)
(a) 54 m² (b) 21 m² (c) 108 m² (d) 42 m²

Q.351. If the perimeter of a right triangle is 56 cm and the area of the triangle is 84 cm², then the length of the hypotenuse is:
RRB NTPC 22/02/2021 (Evening)
(a) 25 cm (b) 24 cm (c) 7 cm (d) 50 cm

Q.352. If the area of an incircle of an equilateral triangle is 462 cm², find the perimeter of the triangle.
RRB NTPC 23/02/2021 (Morning)
(a) 186 cm (b) $42\sqrt{6}$ cm
(c) $21\sqrt{3}$ cm (d) 126 cm

Q.353. Read the given information and statements carefully and decide which option is correct with respect to the statements.
If a circle has a radius(r), area(A) and circumference(C) then
Statement :
1. $A : C^2 = 1 : 4\pi$
2. $A : C = r : 2$
RRB NTPC 27/02/2021 (Morning)
(a) Only statement 2 is true
(b) Both statements 1 and 2 are false
(c) Only statement 1 is true.
(d) Both statements 1 and 2 are true.

Q.354. A circle, made of wire, of diameter 49 cm is formed into a rectangle whose sides are in the ratio 7 : 4. Find the area of the rectangle. [Take $\pi = \frac{22}{7}$]
RRB NTPC 27/02/2021 (Evening)
(a) 1372 sq cm (b) 1402 sq cm
(c) 1350 sq cm (d) 1312 sq cm

Q.355. A wheel makes 1000 revolutions in covering a distance of 154 km. Find the radius (in metre) of the wheel.
RRB NTPC 27/02/2021 (Evening)
(a) $24\frac{1}{2}$ (b) $4\frac{1}{2}$ (c) $24\frac{1}{3}$ (d) $25\frac{1}{2}$

Q.356. In a parallelogram, the altitude is twice the corresponding base, and the area of the parallelogram is 288 m^2. The altitude of the parallelogram is:
RRB NTPC 01/03/2021 (Morning)
(a) 12 m (b) 18 m (c) 24 m (d) 36 m

Q.357. If the hypotenuse of a right angled isosceles triangle is 8 cm. Then the area of the triangle is:
RRB NTPC 01/03/2021 (Morning)
(a) 16 cm^2 (b) 8 cm^2
(c) $\sqrt{32}\ cm^2$ (d) $2\sqrt{32}\ cm^2$

Q.358. A rectangular room has an area 60 m² and perimeter 34 m. Find the length of its diagonal.
RRB NTPC 01/03/2021 (Evening)
(a) 14.5 m (b) 13 m (c) 12 m (d) 13.5 m

Q.359. The total surface area of a cube of side measuring 2 m is.
RRB NTPC 02/03/2021 (Morning)
(a) 20 m² (b) 25 m² (c) 30 m² (d) 24 m²

Q.360. Two regular polygons have the same number of sides. If the lengths of the sides are in the ratio 3 : 5, then the ratio of their respective areas is:
RRB NTPC 02/03/2021 (Evening)
(a) 3 : 23 (b) 6 : 11 (c) 9 : 25 (d) 4 : 7

Q.361. If the radius of a circle is decreased by 35%, then its area decreases by:
RRB NTPC 02/03/2021 (Evening)
(a) $56\frac{3}{4}$% (b) $57\frac{2}{4}$% (c) $57\frac{1}{4}$% (d) $57\frac{3}{4}$%

Q.362. The length and breadth of a rectangle are in the ratio 2 : 1. The numerical value of the perimeter and the area of the rectangle are in the ratio 3 : 4. Find the length of the rectangle.
RRB NTPC 03/03/2021 (Morning)
(a) 16 units (b) 4 units
(c) 6 units (d) 8 units

Q.363. The length of a rectangle is 2 cm more than its breadth. If the perimeter of the rectangle is 20 cm, then its area is..
RRB NTPC 03/03/2021 (Morning)
(a) 20 cm² (b) 24 cm²
(c) 4 cm² (d) 14 cm²

Q.364. If the inradius of a triangle with perimeter 64 cm is 8 cm, then find the area of the triangle.
RRB NTPC 03/03/2021 (Morning)
(a) 120 cm² (b) 256 cm²
(c) 265 cm² (d) 146 cm²

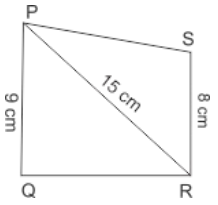
Q.365. Radius of a solid spherical ball with volume 38808 cm^3 is:
RRB NTPC 03/03/2021 (Evening)
(a) 9261 cm (b) 21 cm
(c) 42 cm (d) $\frac{21}{2}$ cm

Q.366. Each side of a square is increased by 50%. Find the percentage increase in its area.
RRB NTPC 03/03/2021 (Evening)
(a) 125% (b) 150% (c) 25% (d) 50%

Q.367. The four sides of a quadrilateral are in the ratio of 4 : 5 : 6 : 7 and its perimeter is 176 cm. Find the length of its longest side.
RRB NTPC 04/03/2021 (Morning)
(a) 75 cm (b) 65 cm (c) 57 cm (d) 56 cm

Q.368. Find the area of the curved surface of a cone of radius 7 cm and slant height 25 cm.
RRB NTPC 04/03/2021 (Evening)
(a) 550 cm^2 (b) 225 cm^2
(c) 500 cm^2 (d) 450 cm^2

Q.369. Observe the figure below and find the area of trapezium PQRS.



RRB NTPC 04/03/2021 (Evening)
(a) 119 cm^2 (b) 108 cm^2
(c) 114cm^2 (d) 102 cm^2

Q.370. The volume of the hemisphere is 19404 cm^3. Its radius is : (Use $\pi = \frac{22}{7}$)
RRB NTPC 05/03/2021 (Morning)
(a) 30 cm (b) 20 cm (c) 21 cm (d) 19 cm

Q.371. If length of each side of a cube is doubled, then the volume _____ the original volume.
RRB NTPC 05/03/2021 (Morning)
(a) becomes 9 times (b) is doubled
(c) becomes 8 times (d) becomes 6 times

Q.372. Kishore plans to tile his kitchen floor with square tiles. Each side of the tile is 10 cm. The kitchen is 2.4 m long and 1.6 m wide. How many tiles will Kishore need ?
RRB NTPC 07/03/2021 (Morning)
(a) 383 (b) 385 (c) 384 (d) 382

Q.373. The radius and height of a cylinder are 28 cm and 40 cm, respectively. Find its volume.
RRB NTPC 08/03/2021 (Morning)
(a) 1760 cm^3 (b) 689920 cm^3
(c) 86240 cm^3 (d) 98560 cm^3

Q.374. The surface area of a sphere whose radius is 21 m is:
RRB NTPC 08/03/2021 (Morning)
(a) 1000 m^2 (b) 1100 m^2
(c) 11088 m^2 (d) 5544 m^2

Q.375. If the ratio of the areas of two squares is 169 : 196 , then the ratio of their perimeters is :
RRB NTPC 08/03/2021 (Evening)
(a) 196 : 169 (b) 169 : 196
(c) 14 : 13 (d) 13 : 14

Q.376. The area of a square is equal to the area of a rectangle. The ratio of the length and the width of the rectangle is 4 :1. If each edge of the square is 8 cm, what is the perimeter of the rectangle?
RRB NTPC 09/03/2021 (Morning)
(a) 10 cm (b) 40 cm (c) 32 cm (d) 20 cm

Q.377. In a right circular cylinder, the ratio of curved surface area to total surface area is 3 : 7. Find the ratio of height to radius of the cylinder.
RRB NTPC 09/03/2021 (Evening)
(a) 4 : 5 (b) 4 : 3 (c) 5 : 3 (d) 3 : 4

Q.378. If a cube having a side of 8 cm is divided into smaller cubes each having a side of 2 cm, then what will be the total number of smaller cubes each having a side of 2 cm ?
RRB NTPC 09/03/2021 (Evening)
(a) 16 (b) 32 (c) 64 (d) 48

Q.379. The largest sphere is cut off from a solid cube of side 6 cm. The volume of the sphere will be:
RRB NTPC 11/03/2021 (Morning)
(a) 108π cm^3 (b) 12π cm^3
(c) 36π cm^3 (d) 27π cm^3

Q.380. A solid frustum of a cone is of height 8 cm. If the radii of its lower and upper ends are 3 cm and 9 cm respectively, then its slant height is:
RRB NTPC 11/03/2021 (Morning)
(a) 9cm (b) 12 cm (c) 10 cm (d) 15 cm

Q.381. A hemispherical bowl, with an internal radius of 12 cm, contains a liquid. The liquid is to be filled into cylindrical shaped small bottles with a radius of 3 cm and a height of 4 cm. How many bottles would be required to completely empty the bowl ?
RRB NTPC 11/03/2021 (Evening)
(a) 56 (b) 64 (c) 48 (d) 32

Q.382. Find the ratio of the area of the incircle to that of the circumcircle of a square.
RRB NTPC 12/03/2021 (Morning)
(a) 1 : 2 (b) 1 : 3 (c) 3 : 5 (d) 2 : 3

Q.383. Find the area of a rhombus whose side measures 13 cm and one diagonal measures 24 cm.
RRB NTPC 12/03/2021 (Morning)
(a) 110 cm^2 (b) 120 cm^2
(c) 115 cm^2 (d) 125 cm^2

Q.384. The length of a rectangle is 30cm and its with is $\frac{2}{3}$ of its length. What will be the area of a square having a perimeter that is identical to the perimeter of the rectangle described here ?
RRB NTPC 12/03/2021 (Evening)
(a) 640 cm^2 (b) 620 cm^2
(c) 625 cm^2 (d) 600 cm^2

Q.385. A hollow sphere of internal and external diameter 4 cm and 8 cm is melted into cone of base diameter 8 cm .The height of the cone is ;
RRB NTPC 12/03/2021 (Evening)
(a) 15 cm (b) 14 cm (c) 16 cm (d) 20 cm

Q.386. A cistern 8 m long and 4 m wide contains water up to a depth of 1 m 22 cm. Then the total area of the wet surface is:
RRB NTPC 13/03/2021 (Morning)
(a) 71.28 m^2 (b) 51.28 m^2
(c) 61.28 m^2 (d) 81.28 m^2

Q.387. The diagonal of a cube is $6\sqrt{2}$ cm. The surface area of the cube is:
RRB NTPC 13/03/2021 (Evening)
(a) 72 cm^2 (b) 144 cm^2
(c) 24 cm^2 (d) 36 cm^2

Q.388. A cylinder has 14 cm height and 660 cm^2curved surface area. The volume of the cylinder is: (Take $\pi = \frac{22}{7}$)
RRB NTPC 13/03/2021 (Evening)
(a) 2475 cm^3 (b) 2225 cm^3
(c) 2425 cm^3 (d) 2275 cm^3

Q.389. Two regular polygons have the same number of sides. Their lengths are in the ratio 7:5 and the area of the larger polygon is 1127 cm^2. Find the area of the smaller polygon.
RRB NTPC 14/03/2021 (Morning)
(a) 565 cm^2 (b) 550 cm^2
(c) 585 cm^2 (d) 575 cm^2

Q.390. Two concentric circles drawn with the radius of inner circle 6 cm and outer circle radius 50% more than inner circle. What is the area of the annulus formed between two circles?
RRB NTPC 14/03/2021 (Morning)
(a) $\frac{900}{7}$ cm^2 (b) 990 cm^2
(c) $\frac{990}{7}$ cm^2 (d) $\frac{890}{7}$ cm^2

Q.391. Four circles of radius r cm are placed such a way that their centres form a square. Find the ratio of the area of the square (formed by the centres of the circles) to the area of the rhombus (formed by the touching points of the circles).
RRB NTPC 14/03/2021 (Evening)
(a) (4 - π) : 1 (b) 4 : 1 (c) π : 1 (d) 2 : 1

Q.392. A circle of radius 8 cm circumscribed a square. The length of the side of the square is:
RRB NTPC 15/03/2021 (Morning)
(a) $2\sqrt{2}$ cm (b) $6\sqrt{2}$ cm
(c) $8\sqrt{2}$ cm (d) $4\sqrt{2}$ cm

Q.393. Find the area of a triangle whose sides are 5 cm, 7 cm and 11 cm.
RRB NTPC 15/03/2021 (Morning)
(a) 12.50 cm^2 (b) 12.97 cm^2
(c) 12.30 cm^2 (d) 12.27 cm^2

Q.394. A square park is surrounded by a path of uniform width 1.5 m all around it. The area of the path is $225m^2$.Find the perimeter of the park.
RRB NTPC 15/03/2021 (Morning)
(a) 144.5 m (b) 143 m
(c) 144 m (d) 142 m

Q.395. If the perimeter and area of a square are numerically equal then the side of the square is:
RRB NTPC 15/03/2021 (Evening)
(a) 4 units (b) 2 units
(c) 1 units (d) 16 units

Q.396. Identical square slabs are used to pave the floor of a room. 4.5 m long and 1.5m in broad. Find the minimum number of such slabs that will be needed to pave the floor.
RRB NTPC 19/03/2021 (Morning)
(a) 10 (b) 3 (c) 5 (d) 2

Q.397. The hypotenuse of a right isosceles triangle is $28\sqrt{2}$ cm. Find the area of the triangle.
RRB NTPC 19/03/2021 (Morning)
(a) 396 cm^2 (b) 784 cm^2
(c) 392 cm^2 (d) 468 cm^2

Q.398. The radius of a sphere 'r'. is equal to the radius of the base of a right circular cone. The total volume of the two shapes $\frac{7}{3}\Pi r^3$. If 'h' is the height of the cone, find $\frac{h}{r}$.
RRB NTPC 19/03/2021 (Morning)
(a) 3 (b) 2.5 (c) 4 (d) 2

Q.399. The difference between the circumference and the radius of the circle is 37 cm. The area of the circle is:
RRB NTPC 19/03/2021 (Evening)
(a) $152cm^2$ (b) $154cm^2$
(c) $151cm^2$ (d) $153cm^2$

Q.400. If an equilateral triangle has an altitude of length $12\sqrt{5}$ cm, then the difference between the areas of the circumscribed circle and the inscribed circle is:
RRB NTPC 19/03/2021 (Evening)
(a) 246 πcm^2 (b) 244 πcm^2
(c) 242 πcm^2 (d) 240 πcm^2

Q.401. In a triangle, the ratio of the angles is 1: 2 : 3. Find the difference between the greatest and the smallest angle.
RRB NTPC 21/03/2021 (Morning)
(a) 60^0 (b) 30^0 (c) 0^0 (d) 45^0

Q.402. Find the number of lead balls of diameter 1 cm each that can be made from a lead sphere of diameter 16 cm.
RRB NTPC 21/03/2021 (Morning)
(a) 4090 (b) 4075 (c) 4096 (d) 4080

Q.403. A square field of 2 sq km area is to be divided into two equal parts by a fence that coincides with a diagonal. Find the length of the fence.
RRB NTPC 21/03/2021 (Morning)
(a) $\sqrt{2}$ km (b) 2 km (c) 3 km (d) 1 km

Q.404. Three cubes of a metal whose edges are 3,4 and 5 cm respectively are melted and formed into a single cube. If there is no loss of metal in the process, Find the side of the new cube.
RRB NTPC 21/03/2021 (Evening)
(a) 8 cm (b) 10 cm (c) 6 cm (d) 9 cm

Q.405. The side of an equilateral triangle is 10 cm. Find its altitude.
RRB NTPC 21/03/2021 (Evening)
(a) $6\sqrt{3}$ cm (b) $3\sqrt{3}$ cm
(c) $4\sqrt{3}$ cm (d) $5\sqrt{3}$ cm

Q.406. The curved surface area of a cylindrical pillar is $66m^2$ and its volume is $231m^3$. Find the measure of its radius ($\pi = \frac{22}{7}$)
RRB NTPC 27/03/2021 (Morning)
(a) 12 m (b) 7 m (c) 14 m (d) 7.5 m

Q.407. If the radius of a cylinder is doubled and the height is halved. What will be the ratio of the new volume to the previous volume ?
RRB NTPC 27/03/2021 (Morning)
(a) 2 : 1 (b) 1 : 2 (c) 3 : 2 (d) 2 : 3

Q.408. The two sides of a triangle measure 10 cm and 8 cm respectively. The area of the triangle is equal to 16 $\sqrt{6}\ cm^2$ Find the length of the third side, given that it is a rational number.
RRB NTPC 27/03/2021 (Evening)
(a) 16 cm (b) 10 cm (c) 14 cm (d) 12 cm

Q.409. The sides of a triangle are in the ratio of $\frac{2}{5} : \frac{1}{3} : \frac{3}{5}$ and its perimeter is 110 cm. The length of the shortest side is:
RRB NTPC 27/03/2021 (Evening)
(a) 27.5 cm (b) 33 cm
(c) 30 cm (d) 49.5 cm

Q.410. The altitude drawn to the base of an isosceles triangle is 12 cm and the perimeter is 36 cm. Find the area of the triangle.
RRB NTPC 27/03/2021 (Evening)
(a) 90 cm^2 (b) 60 cm^2
(c) 120 cm^2 (d) 100 cm^2

Q.411. If the circumference and area of a circle are numerically equal then the radius of the circle is :
RRB NTPC 01/04/2021 (Morning)
(a) 4 units (b) 2 units
(c) 16 units (d) 1 unit

Q.412. A rectangular box has sides 3, 4 and 5 cm. What will be the maximum length of a stick that can be placed inside the box?
RRB NTPC 01/04/2021 (Evening)
(a) 5 cm (b) 4 cm (c) $2\sqrt{5}$cm (d) $5\sqrt{2}$cm

Q.413. The area of a circle is equal to the area of a square. What is the ratio of the circumference of the circle to the perimeter of the square?
RRB NTPC 01/04/2021 (Evening)
(a) $\sqrt{2}\pi$: 1 (b) $\sqrt{\pi}$: 2 (c) π : 2 (d) 2 : $\sqrt{\pi}$

Q.414. A spherical ball of 12 cm diameter is melted and cast into a cone, the base of which has a diameter of 8 cm. What is the height of the cone?
RRB NTPC 01/04/2021 (Evening)
(a) 42 cm (b) 36 cm (c) 54 cm (d) 48 cm

Q.415. A hemispherical bowl of internal radius of 12 cm contains a Liquid. This liquid is to be filled into conical shaped small bottles of base diameter 3 cm and height 4 cm. How many same types of bottles will be needed to empty the bowl?
RRB NTPC 03/04/2021 (Morning)
(a) 520 (b) 384 (c) 438 (d) 400

Q.416. The perimeters of two squares are 48 cm and 60 cm. Find the perimeter of a third square whose area is equal to the difference of the area of the squares.
RRB NTPC 03/04/2021 (Morning)
(a) 32 cm (b) 44 cm (c) 36 cm (d) 40 cm

Q.417. The Capacity of a cylindrical tank is 38,500 litres. If the height is 4 metres, then what is the diameter of the base?
RRB NTPC 03/04/2021 (Morning)
(a) 7 m (b) 3.5 m (c) 17.5 m (d) 1.75 m

Q.418. Two concentric circles form a circular path. The inner and outer circumferences of the path are $56\frac{4}{7}$ $m\ and\ 94\frac{2}{7}$m respectively.
Find the width of the path.
RRB NTPC 03/04/2021 (Morning)
(a) 2 m (b) 6 m (c) 9 m (d) 3 m

Q.419. In a quadrilateral, the length of one of its diagonals is 23 cm and the perpendiculars drawn on this diagonal from other two vertices measure 17 cm and 7 cm respectively. Find the area of the quadrilateral.
RRB NTPC 03/04/2021 (Evening)
(a) 276 cm^2 (b) 376 cm^2
(c) 300 cm^2 (d) 286 cm^2

Q.420. Find the area of the greatest square that can be inscribed in a circle of circumference of 44cm.
RRB NTPC 03/04/2021 (Evening)
(a) $49\sqrt{2}\ cm^2$ (b) 196 cm^2
(c) 49 cm^2 (d) 98 cm^2

Q.421. The perimeter of a square and circumference of a circle are the same. What is the ratio of the area of the square to that of the circle?
RRB NTPC 05/04/2021 (Morning)
(a) π : 4 (b) 4 : π (c) 2 : π (d) π : 2

Q.422. If a cube of side 20 cm is divided into smaller cubes of side 4 cm, then what is the total number of smaller cubes ?
RRB NTPC 05/04/2021 (Morning)
(a) 64 (b) 125 (c) 100 (d) 27

Q.423. Find the volume of a cuboid, if its length is 2 times more than its breadth and the breadth is 12 cm which is twice its height.
RRB NTPC 05/04/2021 (Evening)
(a) 2952 cm^3 (b) 2692 cm^3
(c) 2592 cm^3 (d) 2295 cm^3

Q.424. If the length, breadth and height of a room are 30 m, 20 m, and 40 m respectively, then what will be the area of the four walls of the room?
RRB NTPC 05/04/2021 (Evening)
(a) 3600 m^2 (b) 4000 m^2
(c) 4500 m^2 (d) 1800 m^2

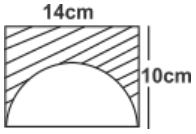
Q.425. In a right circular cylinder, the ratio of the curved surface area to the total surface area is 2 : 5. Find the ratio of the height to the radius of the cylinder.
RRB NTPC 06/04/2021 (Morning)
(a) 3 : 4 (b) 2 : 5 (c) 5 : 3 (d) 2 : 3

Q.426. The length of a rectangular solar panel is 5% more than its breadth. If the area of the solar panel is 210 m², find its breadth.
RRB NTPC 06/04/2021 (Morning)
(a) 210 m (b) $20\sqrt{2}$m
(c) $10\sqrt{2}$m (d) 10 m

Q.427. Which one of the following triplets can be the measures of the sides of a triangle ?
RRB NTPC 06/04/2021 (Morning)
(a) 1, 2 ,4 (b) 11, 3, 7
(c) 1, 1.5, 3 (d) 5, 7, 4

Q.428. If the radius of a sphere is tripled, then its surface area is increased by:
RRB NTPC 06/04/2021 (Morning)
(a) 800% (b) 400% (c) 300% (d) 900%

Q.429. A semicircle has been drawn on the length of a rectangle. The area of the shaded region in the figure is:



RRB NTPC 06/04/2021 (Evening)
(a) 129 cm^2 (b) 63 cm^2
(c) 14 cm^2 (d) 77 cm^2

Q.430. A path, 5m, wide runs around and outside a rectangular plot of land of length 10 m and breadth 8m. The area of path is:
RRB NTPC 07/04/2021 (Morning)
(a) 280 m^2 (b) 380 m^2
(c) 260 m^2 (d) 160 m^2

Q.431. The area of a rectangle with a length of 121 m is the same as that of a square with a side of 44 m. Find the width of the rectangle.
RRB NTPC 07/04/2021 (Evening)
(a) 17 m (b) 14 m (c) 15 m (d) 16 m

Q.432. A piece of wire is bent to form a circle with a radius of 70 cm. If the same piece of wire is bent to form a square, the length of the side of the square will be _____.(Use $\pi = \frac{22}{7}$)
RRB NTPC 08/04/2021 (Morning)
(a) 140 cm (b) 110 cm
(c) 120 cm (d) 160 cm

Q.433. If p is the length of a rectangle and its width is one - third of its length, then the area of the rectangle will be:
RRB NTPC 08/04/2021 (Morning)
(a) $\frac{p^2}{3}$ (b) $\frac{p^2}{5}$ (c) p^2 (d) $\frac{p^2}{4}$

Q.434. What is the ratio of the surface areas of two spheres, if their volumes are in the ratio 8 : 27 ?
RRB NTPC 08/04/2021 (Evening)
(a) 2 : 3 (b) 4 : 9 (c) 8 : 27 (d) 4 : 3

Q.435. A fence is constructed along the diagonal of a square field, What is the length of the fence (in km) if the area of the square field is 2 km^2 ?
RRB NTPC 08/04/2021 (Evening)
(a) 2 (b) 5 (c) 4 (d) 3

Q.436. The radius of a sphere 'r', is equal to the radius of the base of a right circular cylinder. The total volume of these two solids are $\frac{7}{3}\pi r^2$. If 'h' is the height of the cylinder. Find $\frac{h}{r}$.
RRB NTPC 23/07/2021 (Morning)
(a) 2 (b) 3 (c) 1 (d) 1.5

Q.437. If the volume of a cube is equal to the volume of a cuboid of dimensions 54 cm, 18 cm and 6 cm, then the length of the side of the cube is :
RRB NTPC 23/07/2021 (Evening)
(a) 18 cm (b) 12 cm (c) 16 cm (d) 24 cm

Q.438. The radius and height of a solid cylinder are 6m and 5m. How many solid spheres of radius 3m can be formed from that cylinder ?
RRB NTPC 24/07/2021 (Morning)
(a) 10 (b) 5 (c) 8 (d) 4

Q.439. A rhombus has one diagonal double the other. If the area of the rhombus is K cm^2, then the length of its side will be:
RRB NTPC 24/07/2021 (Evening)
(a) $\frac{5\sqrt{k}}{4}$ cm (b) 5k cm
(c) $\frac{\sqrt{5k}}{4}$ cm (d) $\sqrt{\frac{5k}{4}}$ cm

Q.440. The area of a square field is 10,000m^2. Find the perimeter of the square whose side is equal to the diagonal of the field.
RRB NTPC 26/07/2021 (Evening)
(a) 10,000 m (b) $400\sqrt{2}$ m
(c) 20,000 m (d) 40,000 m

Q.441. Find the perimeter of a rectangle that has a length 5 m more than its width and a perimeter equal in value to one - third of its area.
RRB NTPC 26/07/2021 (Evening)
(a) 60 m (b) 45 m (c) 40 m (d) 50 m

Q.442. The length, breadth and height of a room are in the ratio 4: 3: 2. If the length and height are halved while the breadth is doubled, then the new area of the four walls of the room will:
RRB NTPC 31/07/2021 (Evening)
(a) decrease approximately 13.64%
(b) decrease approximately by 26%
(c) decrease approximately by 42.86 %
(d) remain the same

Q.443. The inside measurements of a tank shows its 25 m long. 12 m wide and 6m deep. The cost of plastering its walls and bottom from inside at the rate of 75 paise per m^2 is:
RRB NTPC 31/07/2021 (Evening)
(a) Rs. 558 (b) Rs. 458
(c) Rs. 512 (d) Rs. 496

Q.444. Three circles of radius 3.5 cm are placed such a way that each circle touches the other two. The area of the portion enclosed by the circles is (take $\sqrt{3} = 1.732$):
RRB NTPC 31/07/2021 (Evening)
(a) 2.56 cm^2 (b) 1.652 cm^2
(c) 1.967 cm^2 (d) 1.856 cm^2

RRB JE
(22/05/2019 to 28/06/2019)

Q.445. Two right circular cones of height 16.4 cm and 17.2 cm respectively have a base radius of 8.4 cm. These two cones are melted and recast into a sphere. Find the diameter of the sphere.
RRB JE 22/05/2019 (Evening)
(a) 8.2 cm (b) 16.8 cm
(c) 8.6 cm (d) 8.4 cm

Q.446. Perimeter of an isosceles triangle is 32 cm. The base is $\frac{6}{5}$ times the equal side. What is the area?
RRB JE 22/05/2019 (Evening)
(a) 64 cm^2 (b) 48 cm^2
(c) 57 cm^2 (d) 39 cm^2

Q.447. If the surface area of a cube is 3750 cm^2, then find its volume.
RRB JE 23/05/2019 (Evening)
(a) 12225 cm^3 (b) 15625 cm^3
(c) 14255 cm^3 (d) 16625 cm^3

Q.448. What will be the cost of gardening

a 1 m broad boundary around a rectangular plot having a perimeter of 340 m at the rate of Rs. 10 per square meter ?
RRB JE 23/05/2019 (Evening)
(a) Cannot be determined (b) Rs.3440
(c) Rs.3400 (d) Rs.1700

Q.449. The diagonal of the floor of a rectangular closet is 7.5 ft. The shorter side of the closet 4.5 ft. What is the area of the closet in square feet?
RRB JE 24/05/2019 (Morning)
(a) $27ft^2$ (b) $13.5ft^2$
(c) $37\ ft^2$ (d) $5.25ft^2$

Q.450. In a rectangle, length : breadth = 4 : 3 . What is the value of length: diagonal?
RRB JE 24/05/2019 (Morning)
(a) 4 : 7 (b) 2 : 3 (c) 4 : 5 (d) 1 : 5

Q.451. Curved surface area of a cylinder is 440 cm^2. The base circumference is 44 cm. What is its volume?
RRB JE 24/05/2019 (Afternoon)
(a) 1240 cm^3 (b) 710 cm^3
(c) 1540 cm^3 (d) 3050 cm^3

Q.452. Volume of material used in constructing a hollow cylinder of height 24 cm and thickness 1 cm is 96Π. What is the sum of the Internal and external radius ?
RRB JE 24/05/2019 (Evening)
(a) 7 cm (b) 3 cm (c) 4 cm (d) 5 cm

Q.453. The base of a right pyramid is a square with diagonal 16 units. Its slant edge is 17 units. What is its vertical height?
RRB JE 24/05/2019 (Evening)
(a) 30 (b) 12 (c) 15 (d) 25

Q.454. What is the area of a regular hexagon of side 6 cm?
RRB JE 24/05/2019 (Evening)
(a) $108\sqrt{3}cm^2$ (b) $64\sqrt{3}cm^2$
(c) $54\sqrt{3}cm^2$ (d) $72\sqrt{3}cm^2$

Q.455. Edges of a cuboid are in the ratio 1 : 2 : 3. Its surface area is 88 cm². What is its volume?
RRB JE 25/05/2019 (Afternoon)
(a) 120 cm^3 (b) 64 cm^3
(c) 48 cm^3 (d) 24 cm^3

Q.456. The radius of a sphere is 3 times the radius of a cylinder. If their volumes are equal, find the height of the cylinder.
RRB JE 25/05/2019 (Evening)
(a) 36 times its radius
(b) 27 times its radius
(c) 3 times its radius
(d) Equal to its radius

Q.457. Circumference of a circle is 132 cm. What is the perimeter of its sector whose central angle is 135° ?
RRB JE 26/05/2019 (Afternoon)
(a) 92.5 cm (b) 93.5 cm
(c) 101.5 cm (d) 91.5 cm

Q.458. A cone is 32 cm high and the radius of its base is 8 cm. It is melted and recast into a sphere. Find the radius of the sphere.
RRB JE 26/05/2019 (Evening)
(a) 6.5 cm (b) 2.5 cm (c) 4 cm (d) 8 cm

Q.459. A hemispherical metallic solid is melted and recast into a cone of equal radius 'R'. If the height of the cone is H, then:
RRB JE 27/05/2019 (Morning)
(a) H = R (b) H = $\frac{R}{2}$
(c) H = 2R (d) H = $\frac{R}{3}$

Q.460. A metal pipe of radius 21 cm and length 90 cm has an outer curved surface area:
RRB JE 27/05/2019 (Evening)
(a) 11480 cm^2 (b) 10880 cm^2
(c) 12880 cm^2 (d) 11880 cm^2

Q.461. The diagonals of a rhombus are in the ratio 5: 4, then what is the ratio of the area of the rhombus to the product of the diagonals ?
RRB JE 27/05/2019 (Evening)
(a) 4 : 1 (b) 2 : 1 (c) 1 : 2 (d) 1 : 4

Q.462. Two cones are such that the ratio of their volumes is 1 : 10 and ratio of their heights is 2 : 5. What is the ratio of their base radii?
RRB JE 28/05/2019 (Morning)
(a) 1 : 2 (b) 7 : 25 (c) 2 : 1 (d) 5 : 2

Q.463. Find the total surface area of a cone of slant height '2l' and radius '$\frac{r}{2}$'.
RRB JE 28/05/2019 (Afternoon)
(a) 2πr(l + r) (b) πr[l + ($\frac{r}{4}$)]
(c) 2πrl (d) πr(l + r)

Q.464. The length of a rectangular plot is 20m more than its breadth. If the cost of fencing the plot at Rs.26.50 per metre is Rs.5300, what is the length of the plot in metres ?
RRB JE 29/05/2019 (Morning)
(a) 50 m (b) 40 m (c) 120 m (d) 60 m

Q.465. A sector of a circle of radius 21 cm and central angle 120° is folded into a cone. Radius of the cone thus obtained is:
RRB JE 29/05/2019 (Morning)
(a) 42 cm (b) 21 cm (c) 7 cm (d) 7.5 cm

Q.466. In two similar triangles, ratio of their corresponding sides is 1 : 3 and the area of the larger triangle is 72 cm². then find the area of the smaller triangle.
RRB JE 29/05/2019 (Morning)
(a) 18 cm^2 (b) 8 cm² (c) 14 cm^2 (d) 9 cm^2

Q.467. A square sheet of paper is folded into a cylinder by rolling along its side. What is the ratio of side of the square to the base radius of the cylinder?
RRB JE 29/05/2019 (Evening)
(a) 2π : 1 (b) 1 : 4π (c) 1 : π (d) 1 : 2π

Q.468. A solid is in the shape of a cone fitted on a hemisphere both with radii 2 cm and height of cone being equal to its radius. What is the volume of this solid?
RRB JE 30/05/2019 (Morning)
(a) 2π cm^3 (b) 6π cm^3
(c) 8π cm^3 (d) 4π cm^3

Q.469. A solid cube of side 12 cm is cut into eight smaller cubes of equal volume. The side of the small cube will be:
RRB JE 30/05/2019 (Morning)
(a) 3 cm (b) 6 cm (c) 1.5 cm (d) 4 cm

Q.470. A rectangle has a width 'a' and length 'b'. If the width is decreased by 20% and the length is increased by 10%, then what is the area of the new rectangle in percentage compared to 'ab' ?
RRB JE 30/05/2019 (Morning)
(a) 120% (b) 80% (c) 88% (d) 110%

Q.471. A box whose every side is a rectangle has a length of 12 cm, width of 8 cm and height of 10 cm. What is the total surface area of the box?
RRB JE 30/05/2019 (Evening)
(a) 592 cm^2 (b) 376 cm^2
(c) 524 cm^2 (d) 482 cm^2

Q.472. What is the radius of a cylinder whose volume is 3850 cm^3 and height 25 cm ?
RRB JE 31/05/2019 (Afternoon)
(a) 14 cm (b) 10.5 cm (c) 7 cm (d) 3.5 cm

Q.473. What is the area of the jogging track which is 2 m wide that runs along the perimeter of a rectangle 20 m × 18 m inside it ?
RRB JE 31/05/2019 (Evening)
(a) 200 m^2 (b) 140 m^2
(c) 136 m^2 (d) 168 m^2

Q.474. A towel, when bleached, was found to have lost 20% of its length and 10% of its breadth. Find the percentage of decrease in its area.
RRB JE 31/05/2019 (Evening)
(a) 20% (b) 28% (c) 10.08% (d) 10%

Q.475. The area of a rectangle is $\frac{9}{20}$ times the area of a square. If the length and breadth of the rectangle are in the ratio 5 : 4 , then find the ratio of perimeters of rectangle and square.
RRB JE 31/05/2019 (Evening)
(a) 25 :48 (b) 27 : 20 (c) 27:40 (d) 25 :45

Q.476. Find the volume of a sphere whose surface area is 1386 m².
RRB JE 01/06/2019 (Morning)
(a) 3850 m^3 (b) 4651 m^3
(c) 4851 m^3 (d) 5711 m^3

Q.477. The length of the direct common tangent to two circles of radii r_1 and r_2 and d is the distance between their centres is:
RRB JE 01/06/2019 (Morning)
(a) $\sqrt{d^2(r_1 r_2)}$
(b) $\sqrt{d^2 - (r_1^2 r_2^2)}$
(c) $\sqrt{d^2 - (r_1 + r_2)^2}$
(d) $\sqrt{d^2 - (r_1 - r_2)^2}$

Q.478. The curved surface areas of two cones are in the ratio 2 : 1 ; their slant heights are in the ratio 1 : 2. What is the ratio of their radii?
RRB JE 01/06/2019 (Morning)
(a) 4 : 1 (b) 1 : 1 (c) 1 : 3 (d) 1 : 4

Q.479. Two right circular cylinders of equal volume have their heights in the ratio 1 : 2. Find the ratio of their radii.
RRB JE 01/06/2019 (Afternoon)
(a) 2 : 1 (b) 1 : 2 (c) 1 : $\sqrt{2}$ (d) $\sqrt{2}$: 1

Q.480. Two squares differ in areas by 32 cm². If the difference in their sides is 4 cm, what are the sides of the two squares ?
RRB JE 01/06/2019 (Evening)
(a) 4 cm, 2 cm (b) 12 cm, 8 cm
(c) 6 cm, 2 cm (d) 4 cm, 4 cm

Q.481. The breadth of a rectangular field is 60% of its length. If the perimeter of the field is 800 m, what is the area of the field ?
RRB JE 01/06/2019 (Evening)
(a) 40000 m^2 (b) 37500 m^2
(c) 18750 m^2 (d) 48000 m^2

Q.482. If each side of a cube becomes three times of itself, then its volume _____ of its original volume.
RRB JE 01/06/2019 (Evening)
(a) Becomes 9 times
(b) Becomes 27 times
(c) Becomes 3 times
(d) Becomes 2 times

Q.483. Height 'h' of a cylinder equals the circumference of its base. Then, the curved surface area in terms of 'h' is:
RRB JE 02/06/2019 (Morning)
(a) h^3 (b) $\frac{2h}{3}$ (c) $3h^2$ (d) h^2

Q.484. If the volume of a sphere is divided by its surface area, the result is 27 cm. Find the radius of the sphere.
RRB JE 02/06/2019 (Afternoon)
(a) 243 cm (b) 81 cm (c) 27 cm (d) 9 cm

Q.485. The capacity of a cylindrical tank is 3080 m³. If the radius of its base is 7 m, find the depth of the tank.
RRB JE 02/06/2019 (Evening)
(a) 25 m (b) 10 m (c) 15 m (d) 20 m

Q.486. Find the number of carpets required to spread along the floor of a room of dimensions 40 m × 24 m, if each carpet measures 6m × 4m .
RRB JE 02/06/2019 (Evening)
(a) 40 (b) 15 (c) 12 (d) 18

Q.487. Mark the right statements.
1. The lateral surfaces of a pyramid are triangles with a common vertex.
2. A pyramid is a special case of a prism.
3. Volume of a pyramid
= $\frac{1}{3}$ x base area x vertical height
4. Volume of a prism
= $\frac{1}{2}$ base area x height
RRB JE 02/06/2019 (Evening)
(a) Statements 1, 2 and 3 only
(b) Statements 1 and 3 only
(c) Statement 1 only
(d) Statements 1, 3 and 4 only

Q.488. A rectangular sheet has its length equal to twice the breadth. If V_1, V_2 are the volumes of the cylinders formed by folding the sheet along its length and along its breadth, then find the ratio of V_1 to V_2.
RRB JE 27/06/2019 (Morning)
(a) 1 : 1 (b) 1 : 3 (c) 2 : 1 (d) 2 : 3

Q.489. A solid cylinder has a total surface area of 462 cm². Its curved surface area is one-third of the total surface area. find its volume.
RRB JE 27/06/2019 (Evening)
(a) 964 cm^3 (b) 810 cm^3
(c) 539 cm^3 (d) 1024 cm^3

RRB ALP Tier - 2
(21/01/2019 to 08/02/2019)

Q.490. The curved surface area of a cone of radius 14 cm is 2200 cm^2, then find its height (in cm).
ALP Tier II 21/01/2019 (Afternoon)
(a) 48 (b) 50 (c) 56 (d) 49

Q.491. A match box measures 3 cm x 4 cm x 5 cm. What will be the volume (in cm^3) of a packet containing 12 such boxes?
ALP Tier II 21/01/2019 (Afternoon)
(a) 650 (b) 720 (c) 600 (d) 700

Q.492. The length and breadth of a rectangle are 6cm and 8 cm respectively. Then what will be the area (in cm^2) of a square whose side is equal to the length of the diagonal of this rectangle.
ALP Tier II 21/01/2019 (Evening)
(a) 100 (b) 92 (c) 96 (d) 196

Q.493. If the total area of the cube is 96 sq cm, then what is the length of side of the cube?
ALP Tier II 21/01/2019 (Evening)
(a) 3 (b) 4 (c) 5 (d) 2

Q.494. Find the length of the diagonal of a cube whose side is 3 cm?
ALP Tier II 21/01/2019 (Morning)
(a) 4.5 cm (b) 6 cm (c) 3√3 cm (d) 4 cm

Q.495. A solid sphere of diameter 12 cm is melted and cast into three spheres. If the diameters of two spheres are 6 cm and 10 cm respectively, then what will be the surface area (in cm^2) of the third sphere?
ALP Tier II 21/01/2019 (Morning)
(a) 24π (b) 48π (c) 32π (d) 64π

Q.496. What is the diameter (in cm) of a sphere of area 1386 cm^2 ?
ALP Tier II 23/01/2019 (Morning)
(a) 21 (b) 14 (c) 24.5 (d) 10.5

Q.497. The total surface area of a cuboid is 236 cm^2 . Its length is 8 cm and height is 6 cm. Find its breadth (in cm).
ALP Tier II 23/01/2019 (Afternoon)
(a) 9 (b) 7 (c) 4 (d) 5

Q.498. How many bricks will be required to build a wall of 1.6 m x 1.0 m x 20 cm , if the size of each brick is 10 cm x 8 cm x 4 cm ?
ALP Tier II 08/02/2019 (Morning)

(a) 8,000 (b) 6,000 (c) 1,000 (d) 4,000

RPF Constable (17/01/2019 to 19/02/2019)

Q.499. Find the area of rhombus whose diagonals are given as 25 cm and 26 cm ?. (in cm^2)
RPF Constable 17/01/2019 (Evening)
(a) 1326 (b) 1426 (c) 1126 (d) 1226

Q.500. The sides of a quadrilateral are in the ratio 2 : 3 : 4 : 5 and its perimeter is 196 cm. Find the smallest side. (in cm)
RPF Constable 18/01/2019 (Afternoon)
(a) 27 (b) 28 (c) 33 (d) 26

Q.501. The width of a rectangle is 65cm and its area is 10140 cm^2. find its perimeter(in cm) .
RPF Constable 18/01/2019 (Afternoon)
(a) 452 (b) 442 (c) 422 (d) 432

Q.502. The width of a rectangle is 50 cm and one of its diagonals is 130 cm. Find out its perimeter (in cm)
RPF Constable 18/01/2019 (Evening)
(a) 350 (b) 320 (c) 330 (d) 340

Q.503. The base of a parallelogram is three times its height. If the area is 1083 sq .cm then find the value of base and height ?
RPF Constable 19/01/2019 (Morning)
(a) 36,12 (b) 45,15 (c) 57,19 (d) 30,10

Q.504. If the volume of a conference room is 1188m^3 and its floor area is 99m^2, then find the height of the room.
RPF Constable 19/01/2019 (Morning)
(a) 17m (b) 12m (c) 21m (d) 18m

RPF S.I. (19/12/2018 to 16/01/2019)

Q.505. If the radius of a circle is increased by 6 times, its circumference will increase by how many times from its former circumference?
RPF S.I. 19/12/2018 (Morning)
(a) 8 (b) 5 (c) 6 (d) 7

Q.506. The area of a square piece of glass is 484 cm^2, which is placed on the top of a table. The width between the piece of glass and one edge of the table is 5 cm. Find the length of the table?
RPF S.I. 19/12/2018 (Morning)
(a) 30cm (b) 34cm (c) 32cm (d) 28cm

Q.507. What will be the height of a cuboid if a solid cube of diagonal $8\sqrt{3}$ cm is melted and recasted into cuboid, if the length of the cuboid is equal to the side of the cube and the breadth of the cuboid is 4 cm.
RPF S.I. 19/12/2018 (Evening)
(a) 12 cm (b) 18 cm (c) 16 cm (d) 14 cm

Q.508. The area of a square piece of glass is 676 cm^2, which is placed on the top of a table. The width between the piece of glass and a side of the table is 9 cm. Find the length of the table?
RPF S.I. 24/12/2018 (Morning)
(a) 24 cm (b) 32 cm (c) 44 cm (d) 48 cm

Q.509. If the cube with a 26√3 cm diagonal is melted then how tall is the height of the cuboid, if the length of the cuboid is equal to the arm of the cube, and the width of the cuboid is 13 cm ? (in cm)
RPF S.I. 05/01/2019 (Morning)
(a) 52 (b) 54 (c) 53 (d) 55

Q.510. The area of a square piece of glass is 1089 cm^2, which is placed on the top of a table. The width between the piece of glass and a side of the table is 9 cm. Find the length of the table ?
RPF S.I. 06/01/2019 (Afternoon)
(a) 51 (b) 53 (c) 52 (d) 50

Q.511. The whole area of the square shape of glass is 1156 cm^2. Which is placed above a table. The width between the table and the glass piece is 9 cm. Tell table length. (in cm)
RPF S.I. 10/01/2019 (Morning)
(a) 52 (b) 51 (c) 53 (d) 50

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.512. The volume of a right circular cone, whose radius of the base is same as one-third of its altitude, and the volume of a sphere are equal. The ratio of the radius of the cone to the radius of the sphere is:
RRB ALP 09/08/2018 (Morning)
(a) 1:1 (b) $\sqrt[3]{4} : \sqrt[3]{3}$
(c) $\sqrt[3]{3} : \sqrt[3]{2}$ (d) $\sqrt[3]{4} : 1$

Q.513. The surface areas of three faces of a cuboid sharing a vertex are 20m^2 , 32m^2 and 40m^2 What is the volume of the cuboid ?
RRB ALP 09/08/2018 (Afternoon)
(a) 184 m^3 (b) 92 m^3
(c) $\sqrt{3024}$ m^3 (d)160 m^3

Q.514. The two sides holding the right-angle in a right-angled triangle are 3 cm and 4 cm long. The area of its circumcircle will be:
RRB ALP 09/08/2018 (Afternoon)
(a) 5π cm^2 (b) 6.75π cm^2
(c) 7π cm^2 (d) 6.25π cm^2

Q.515. A Lawn roller makes 20 revolutions in one hour. The radians it runs through 25 minutes is:
RRB ALP 10/08/2018 (Morning)
(a) $\frac{50\pi}{3}$ (b) $\frac{150\pi}{7}$ (c) $\frac{250\pi}{3}$ (d) $\frac{50\pi}{7}$

Q.516. A shuttle cock used for playing badminton has the shape of a frustum of a cone mounted on a hemisphere. The external diameters of the frustum are 5 cm and 2cm, the height of the entire shuttle cock is 7 cm. Find the external surface area.
RRB ALP 10/08/2018 (Morning)
(a) 74.30 cm^2 (b) 74.26 cm^2
(c) 80 cm^2 (d) 73.38 cm^2

Q.517. The area of a square is equal to its side, if the side is 1 unit.
RRB ALP 10/08/2018 (Afternoon)
(a) Always (b) Never
(c) Sometimes (d) Often

Q.518. The base of a triangle is half the base of a parallelogram having the same area as that of the triangle. The ratio of the corresponding heights of the triangle to the parallelogram will be:
RRB ALP 10/08/2018 (Afternoon)
(a) 2 : 1 (b) 1 : 4 (c) 1 : 2 (d) 4 : 1

Q.519. The area of the base of a cone is 64π cm^2 while its slant height is 17 cm. This cone is remolded to obtain a solid sphere. The radius of this sphere will be:
RRB ALP 14/08/2018 (Afternoon)
(a) 6.5 cm (b) $2\sqrt[3]{30}$ cm
(c) $2\sqrt[3]{40}$ cm (d) $8\sqrt[3]{30}$ cm

Q.520. The length of each side of a rhombus is 25 m and the length of one of its diagonals is 14 m. Find the area of the rhombus.
RRB ALP 14/08/2018 (Evening)
(a) 336 m^2 (b) 350 m^2
(c) 175 m^2 (d) 168 m^2

Q.521. The area of the triangle whose vertices are given by (2, 4), (- 3 , - 1) and (5 , 3) is:
RRB ALP 17/08/2018 (Morning)
(a) 20 sq . units (b) 14 sq . units
(c) 10 sq . units (d) 7 sq . units

Q.522. A spherical glass vessel has a cylindrical neck 7cm long and 4cm in diameter. The diameter of the spherical part is 21cm. Find the quantity of water it can hold.

RRB ALP 17/08/2018 (Evening)
(a) 4932 cm^3 (b) 4939 cm^3
(c) 4930 cm^3 (d) 4929 cm^3

Q.523. The volume of a right circular cone, whose radius of the base is half of its altitude, and the volume of a hemisphere are equal. The ratio of the radius of the cone to the radius of the hemisphere is:
RRB ALP 20/08/2018 (Morning)
(a) $\sqrt{2}:1$ (b) $\sqrt[3]{2}:1$ (c) 1 : 1 (d) 2 : 1

Q.524. From a solid cube of side 7cm, a conical cavity of height 7 cm and radius 3 cm is hollowed out. Find the volume of remaining solid ?
RRB ALP 20/08/2018 (Morning)
(a) 300 cm^3 (b) 272 cm^3
(c) 270 cm^3 (d) 277 cm^3

Q.525. 15 small rods, each of length $23\frac{2}{7}$m are joined to make a big rod. What then is the length of the big rod ?
RRB ALP 21/08/2018 (Morning)
(a) $349\frac{1}{7}$m (b) $349\frac{5}{7}$m
(c) $349\frac{2}{7}$m (d) $349\frac{3}{7}$m

Q.526. A well of diameter 3m and depth 14m is dug. The earth, taken out of it, has been evenly spread all around it in the shape of a circular ring of width 4m to form an embankment. Find the height of the embankment ?
RRB ALP 21/08/2018 (Afternoon)
(a) $\frac{1}{8}$ m (b) $\frac{7}{8}$m (c) $\frac{9}{8}$m (d) $\frac{3}{8}$m

Q.527. A rectangle having 10 cm and 6 cm as its dimensions was reconstructed to make a rhombus having the same perimeter as that of the rectangle and 60° as one of its angles. The area of the rhombus, in cm^2 , was :
RRB ALP 29/08/2018 (Morning)
(a) $8\sqrt{3}$ (b) $32\sqrt{3}$ (c) $16\sqrt{3}$ (d) $24\sqrt{3}$

Q.528. 15 pipes, each having the same diameter, can fill a cistern in 12 minutes. How long will it take for 6 pipes, each with double the original diameter, to fill the same cistern at the same speed of the flow ?
RRB ALP 29/08/2018 (Afternoon)
(a) 7.5 minutes (b) 10 minutes
(c) 9.5 minutes (d) 12 minutes

Q.529. The base of a triangle is five-sixth of the base of a parallelogram having the same area as that of the triangle. The ratio of the corresponding heights of the triangle to the parallelogram will be:
RRB ALP 29/08/2018 (Evening)
(a) 6 : 5 (b) 5 : 3 (c) 12 : 5 (d) 5 : 12

Q.530. The sum of the lengths of the edges of a cube is equal to twice the perimeter of a square. If a quarter of the numerical value of the volume of the cube is equal to the numerical value of the area of the square, then the length of one side of the square is:
RRB ALP 30/08/2018 (Afternoon)
(a) 27 units (b) 13.5 units
(c) 10.5 units (d) 9 units

Answer Key :-

1.(b)	2.(b)	3.(b)	4.(b)
5.(b)	6.(a)	7.(c)	8.(a)
9.(b)	10.(a)	11.(d)	12.(a)
13.(d)	14.(b)	15.(a)	16.(a)
17.(c)	18.(a)	19.(b)	20.(d)
21.(d)	22.(a)	23.(a)	24.(a)
25.(c)	26.(d)	27.(d)	28.(b)
29.(b)	30.(a)	31.(b)	32.(b)
33.(a)	34.(b)	35.(a)	36.(d)
37.(d)	38.(a)	39.(c)	40.(c)
41.(a)	42.(b)	43.(c)	44.(d)
45.(b)	46.(c)	47.(d)	48.(a)
49.(d)	50.(b)	51.(c)	52.(a)
53.(d)	54.(d)	55.(a)	56.(b)
57.(b)	58.(a)	59.(c)	60.(a)
61.(a)	62.(a)	63.(b)	64.(b)
65.(b)	66.(c)	67.(c)	68.(b)
69.(b)	70.(c)	71.(b)	72.(d)
73.(b)	74.(d)	75.(a)	76.(c)
77.(c)	78.(c)	79.(a)	80.(c)
81.(a)	82.(a)	83.(a)	84.(b)
85.(b)	86.(d)	87.(b)	88.(a)
89.(c)	90.(c)	91.(d)	92.(a)
93.(a)	94.(b)	95.(d)	96.(a)
97.(d)	98.(c)	99.(d)	100.(d)
101.(a)	102.(d)	103.(c)	104.(b)
105.(a)	106.(c)	107.(d)	108.(a)
109.(b)	110.(c)	111.(c)	112.(b)
113.(a)	114.(d)	115.(d)	116.(b)
117.(c)	118.(d)	119.(d)	120.(b)
121.(a)	122.(a)	123.(c)	124.(a)
125.(c)	126.(c)	127.(d)	128.(a)
129.(a)	130.(b)	131.(a)	132.(d)
133.(a)	134.(b)	135.(b)	136.(b)
137.(d)	138.(b)	139.(c)	140.(c)
141.(b)	142.(b)	143.(c)	144.(a)
145.(c)	146.(b)	147.(c)	148.(c)
149.(c)	150.(c)	151.(b)	152.(d)
153.(d)	154.(c)	155.(b)	156.(b)
157.(b)	158.(b)	159.(a)	160.(c)
161.(d)	162.(a)	163.(d)	164.(d)
165.(b)	166.(d)	167.(b)	168.(b)
169.(c)	170.(d)	171.(b)	172.(a)
173.(d)	174.(c)	175.(c)	176.(c)
177.(c)	178.(a)	179.(c)	180.(b)
181.(c)	182.(b)	183.(c)	184.(a)
185.(a)	186.(b)	187.(c)	188.(b)
189.(d)	190.(c)	191.(c)	192.(d)
193.(c)	194.(a)	195.(d)	196.(a)
197.(b)	198.(b)	199.(b)	200.(b)
201.(c)	202.(b)	203.(a)	204.(d)
205.(c)	206.(b)	207.(a)	208.(d)
209.(a)	210.(b)	211.(b)	212.(c)
213.(a)	214.(d)	215.(b)	216.(b)
217.(c)	218.(b)	219.(b)	220.(b)
221.(d)	222.(c)	223.(c)	224.(a)
225.(a)	226.(c)	227.(a)	228.(a)
229.(b)	230.(c)	231.(b)	232.(b)
233.(d)	234.(c)	235.(a)	236.(b)
237.(b)	238.(c)	239.(b)	240.(d)
241.(a)	242.(a)	243.(d)	244.(b)
245.(d)	246.(d)	247.(b)	248.(c)
249.(d)	250.(c)	251.(a)	252.(b)
253.(a)	254.(c)	255.(a)	256.(a)
257.(b)	258.(c)	259.(a)	260.(d)
261.(a)	262.(b)	263.(b)	264.(d)
265.(d)	266.(c)	267.(d)	268.(a)
269.(a)	270.(c)	271.(a)	272.(a)
273.(c)	274.(b)	275.(a)	276.(c)
277.(c)	278.(d)	279.(a)	280.(c)
281.(d)	282.(a)	283.(b)	284.(c)
285.(c)	286.(b)	287.(b)	288.(a)
289.(d)	290.(d)	291.(d)	292.(d)
293.(c)	294.(b)	295.(c)	296.(d)
297.(a)	298.(d)	299.(a)	300.(b)
301.(d)	302.(c)	303.(a)	304.(d)
305.(c)	306.(a)	307.(a)	308.(b)
309.(a)	310.(a)	311.(b)	312.(b)
313.(d)	314.(c)	315.(a)	316.(d)

317.(d)	318.(b)	319.(c)	320.(c)
321.(c)	322.(c)	323.(b)	324.(a)
325.(c)	326.(b)	327.(b)	328.(a)
329.(b)	330.(b)	331.(a)	332.(d)
333.(c)	334.(a)	335.(d)	336.(c)
337.(c)	338.(a)	339.(d)	340.(c)
341.(d)	342.(c)	343.(c)	344.(a)
345.(c)	346.(a)	347.(a)	348.(c)
349.(a)	350.(a)	351.(a)	352.(d)
353.(d)	354.(a)	355.(a)	356.(c)
357.(a)	358.(b)	359.(d)	360.(c)
361.(d)	362.(d)	363.(b)	364.(b)
365.(b)	366.(a)	367.(d)	368.(a)
369.(d)	370.(c)	371.(c)	372.(c)
373.(d)	374.(d)	375.(d)	376.(b)
377.(d)	378.(c)	379.(c)	380.(c)
381.(d)	382.(a)	383.(b)	384.(c)
385.(b)	386.(c)	387.(b)	388.(a)
389.(d)	390.(c)	391.(d)	392.(c)
393.(b)	394.(c)	395.(a)	396.(b)
397.(c)	398.(a)	399.(b)	400.(d)
401.(a)	402.(c)	403.(b)	404.(c)
405.(d)	406.(b)	407.(a)	408.(c)
409.(a)	410.(b)	411.(b)	412.(d)
413.(b)	414.(c)	415.(b)	416.(c)
417.(b)	418.(b)	419.(a)	420.(d)
421.(a)	422.(b)	423.(c)	424.(b)
425.(d)	426.(c)	427.(d)	428.(a)
429.(b)	430.(a)	431.(d)	432.(b)
433.(a)	434.(b)	435.(a)	436.(c)
437.(a)	438.(b)	439.(d)	440.(b)
441.(d)	442.(c)	443.(a)	444.(c)
445.(b)	446.(b)	447.(b)	448.(b)
449.(a)	450.(c)	451.(c)	452.(c)
453.(c)	454.(c)	455.(c)	456.(a)
457.(d)	458.(d)	459.(c)	460.(d)
461.(c)	462.(a)	463.(b)	464.(d)
465.(c)	466.(b)	467.(a)	468.(c)
469.(b)	470.(c)	471.(a)	472.(c)
473.(d)	474.(b)	475.(c)	476.(c)
477.(d)	478.(a)	479.(d)	480.(c)
481.(b)	482.(b)	483.(d)	484.(b)
485.(d)	486.(a)	487.(b)	488.(c)
489.(c)	490.(a)	491.(b)	492.(a)
493.(b)	494.(c)	495.(d)	496.(a)
497.(d)	498.(c)	499.(a)	500.(b)

501.(b)	502.(d)	503.(c)	504.(b)
505.(c)	506.(c)	507.(c)	508.(c)
509.(a)	510.(a)	511.(a)	512.(b)
513.(d)	514.(d)	515.(a)	516.(b)
517.(a)	518.(d)	519.(b)	520.(a)
521.(c)	522.(b)	523.(c)	524.(d)
525.(c)	526.(c)	527.(b)	528.(a)
529.(c)	530.(b)		

Solutions:-

Sol.1.(b)
area of inlet × speed × time = volume of tank

$\pi r^2 \times speed \times time = volume$

$\frac{22}{7} \times \frac{3.5}{100} \times \frac{3.5}{100} \times 2 \times$ time

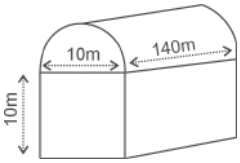
= 2 × 2 × 2

Time = $\frac{8 \times 10000}{22 \times 3.5}$ sec

= $\frac{8 \times 10000}{22 \times 3.5 \times 60}$ = 17.3 minutes

Sol.2.(b) Let the length of rectangle = l and breadth = b
So area of rectangle = lb
ATQ, (l + 4) × (b - 2) =lb + 2
⇒ lb - 2l + 4b -8 = lb + 2
⇒ 4b - 2l = 10 (multiplying with 5)
20b - 10l = 50 ...(1)
And (l - 3) × (b + 5) = lb + 23
⇒ lb + 5l - 3b - 15 = lb + 23
⇒ 5l - 3b = 38 (multiplying with 2)
10l - 6b = 76 ...(2)
By adding equation (1) with (2)
20b - 10l = 50
10l - 6b = 76
14b = 126
So, b = 9, By putting value of b in equation (1) ⇒ 20 × 9 - 10l = 50
⇒ 10l = 130 ⇒ So ⇒ l = 13
Now, perimeter of original rectangle
= 2 × (13 + 9) ⇒ 2 × 22 = 44

Sol.3.(b)



Volume of semi-cylindrical structure forming the roof = $\frac{1}{2} \times \pi r^2 h$

= $\frac{1}{2} \times \frac{22}{7} \times \frac{10}{2} \times \frac{10}{2} \times 140$

= $22 \times 25 \times 10 = 5500\ m^3$

Sol.4.(b) Given,
the volume of cuboid = $5a^2 - 80b^2$

= $5(a^2 - 16b^2) = 5[(a)^2 - (4b)^2]$
= $5(a + 4b)(a - 4b)$
Hence, the possible dimensions of cuboid is 5 , $(a + 4b)\ and\ (a - 4b)$.

Sol.5.(b) Let the length, breadth and height of the cuboid be 2x, 3x and 5x.
Volume of the cuboid = $30x^3$
Now, new length = 4x , breadth = 6x and height = 10x, New volume = $240x^3$
So, new volume is 8 times of the old volume.

Sol.6.(a) Let the length and breadth of the rectangle be 3x and 4x
Area of 48 square plates = area of rectangle
$48 \times 2 \times 2 = 3x \times 4x$
$12x^2 = 192 \Rightarrow x = 4$
Length = 12 cm, breadth = 16 cm
Perimeter of rectangle = 2 (16 + 12)
= 2 × 28 = 56 cm

Sol.7.(c) $\frac{radius\ of\ cylinder}{radius\ of\ hemisphere} = \frac{7x}{6x}$
Volume of cylinder = volume of sphere

$\Rightarrow \pi \times 7x \times 7x \times 21 = \frac{4}{3} \times \pi \times 7 \times 7 \times 7$

$x = \sqrt{\frac{4}{9}} = \frac{2}{3}$, radius of hemisphere

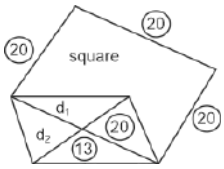
= 6x = $6 \times \frac{2}{3} = 4\ cm$

Now, Volume of hemisphere
= $\frac{2}{3} \times \frac{22}{7} \times 4 \times 4 \times 4 = 134.10\ cm^3$

Sol.8.(a) In 10 minutes the river will cross the distance of = $10 \times \frac{5}{60} = \frac{5}{6}$ km
The volume of water that will be flown in 10 min = $2 \times 21 \times \frac{5}{6}$ = 35000 m^3
⇒ 35000 m^3 = 35000 kilolitre
[as 1 m^3 = 1 kilolitre]

Sol.9.(b) A rhombus has one of its diagonal 65% of the other.
So, if one diagonal is 100 then the other is 65.
Area of rhombus = $\frac{1}{2} \times d_1 \times d_2$
= $\frac{1}{2} \times 100 \times 65 = 50 \times 65$
A/Q, side of square = 100
Area of square = 100 × 100 = 10000
The ratio of area of the rhombus to square = $\frac{50 \times 65}{10000} = \frac{13}{40}$

Short Tricks:-



Let , the diagonal of rhombus be d_1 and d_2

According to question

$d_1 : d_2 \Rightarrow 20 : 13$

Area of square having d_1 as its sides

= 20 × 20 = 400

Area of rhombus : Area of square

$\frac{1}{2} \times d_1 \times d_2 : (d_1)^2$

130 : 400 ⇒ 13 : 40

Sol.10.(a) Given,

diameter of lead sphere = 6 cm

diameter of beaker = 9 cm

Increased height of water level = 32 cm

Let the no. of lead spheres = n,

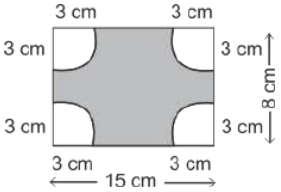
Volume of the cylinder = n × volume of lead sphere

$\Pi R^2 H = n \times \frac{4}{3}\pi r^3$

$\Rightarrow \frac{9}{2} \times \frac{9}{2} \times 32 = n \times \frac{4}{3} \times 3 \times 3 \times 3$

⇒ n = 18

Sol.11.(d)



The area of the four quadrant of the circles having radius

= 3 cm = $4 \times \frac{1}{4} \times \pi \times 3^2 = \frac{198}{7}\ cm^2$

And the area of the quadrilateral having l = 15 cm & b = 8 cm = $15 \times 8 = 120\ cm^2$

So, the area of the shaded region

$= 120 - \frac{198}{7} = \frac{642}{7}\ cm^2$

Sol.12.(a) Let the width = 'x' m

Length = (x + 3) m

Numeric value of Perimeter = Numeric value of Area

⇒ 2(2x + 3) = x(x + 3) ⇒ 4x + 6 = $x^2 + 3x$

$\Rightarrow x^2 - x - 6 = 0$

$\Rightarrow x^2 - 3x + 2x - 6 = 0$

$\Rightarrow x(x - 3) + 2(x - 3) = 0$

$\Rightarrow (x - 3)(x + 2) = 0$

We get x = 3 or -2

Negative value is not possible

∴ length = 6 m and width= 3 m

Diagonal = $\sqrt{36 + 9} = \sqrt{45}$ = 6.7

Integral part of diagonal = 6

Sol.13.(d) Given, L = (3x + 10) m

B = (2x + 5) m

Area of 4 of its walls

= (60x + 180) sq units

Area of 4 of its walls = 2(L + B) × H

ATQ, 2 × (5x + 15) × H

= (60x + 180) sq units

2 × 5(x + 3) × H = 60(x + 3) sq units ,

H = 6 unit

Sol.14.(b) Given , Circle of radius = 36 cm and 4l = 3r Now ,

Area of the sector

= $\frac{1}{2}$ × (length of the sector) × radius

Area of the sector

= $\frac{1}{2} \times (\frac{3 \times 36}{4}) \times (36)$

Area of the sector = $\frac{1}{2} \times 27 \times (36)$

= 486 cm²

Sol.15.(a) Given ,

length = 18 m 72 cm = 1872 cm and width = 13 m 20 cm = 1320 cm

For , maximum edge of the square tile

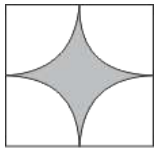
= HCF of (1872 and 1320) = 24 cm

So , required number of tiles =(area of the courtyard) ÷ (area of the square tile)

= $\frac{1872 \times 1320}{24 \times 24}$ = 4290

Hence, the least possible number of such tiles = 4290

Sol.16.(a)



Area of the square = $28^2 = 784 m^2$

Area of the field that can be grazed by the cows = Area of one circle

= $\frac{22}{7} \times 14 \times 14 = 616\ m^2$

Area of the remaining field = 784 - 616

= 168 m^2

According to the question ,

616m^2 area of grass is enough to feed the cows $= 22\ days \Rightarrow 168\ m^2$

area of grass is enough to feed the cows

= $\frac{22}{616} \times 168 = 6\ days$

Sol.17.(c) Circumference of circle = 2πR

For integer , value of R must be an integer multiple of $\frac{1}{\pi}$

Let, x is a +ve integer, then R = $\frac{x}{\pi}$

But , R >1

$\frac{x}{\pi} > 1$, ⇒ x > π ⇒ x > 3.14

For minimum R , x must be minimum So that integer greater than π is 4.

Minimum value of R = $\frac{4}{\pi}$

Sol.18.(a) Volume of water displaced = Displacement of water by 150 men.

⇒ ($90 \times 40 \times h$) = 150 × 8

⇒ $h = \frac{150 \times 8}{90 \times 40}$ = 33.33 cm

Sol.19.(b) In one side of square there will be 13 poles and the gap between 13 poles will be 12 unit.

Side of square = $12 \times 5 = 60\ m$

Area of the square = $60^2 = 3600\ m^2$

Sol.20.(d)

Area = $\frac{30}{360} \times \frac{22}{7} \times 6 \times 6 = 9.43\ cm^2$

Sol.21.(d) Perimeter of rectangle = perimeter of rhombus

= 2 × (24 + 28) = 4a

Side of rhombus = a = 26 cm

Area of rhombus = $a^2 sin\ 120°$

= $676 \times \frac{\sqrt{3}}{2} = 338\sqrt{3}\ cm^2$

Sol.22.(a) 8% = $\frac{2}{25}$

If initial Radius = 25 , new radius = 27

Ratio of the number of revolutions is opposite to the ratio of radius.

Required Ratio = 27 : 25

Sol.23.(a) In both conditions the area will be the same .

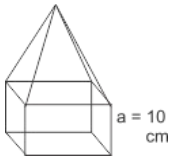
Area in 1st condition = area in 2nd condition

$L_1B_1 = L_2B_2$

$1 \times 1 = 2 \times \frac{1}{2}$

Breadth should be halved

Sol.24.(a)



Volume of the entire object = volume of the cube + volume of the pyramid

Volume of the entire object

= $a^3 + \frac{1}{3} \times a^2 \times 3a$

= $1000 + \frac{1}{3} \times (10)^2\ 30$

Volume of the entire object

= 1000 + 1000 = 2000 cm³

Sol.25.(c) Given , radius of the cylinder = 4 cm and radius of the sphere = 3 cm

According to the question ,

volume of the sphere = volume of rise in the water level of cylindrical vessel

$\frac{4}{3}\pi r^3 = \pi r^2 h$

$\frac{4}{3} \times 3 \times 3 \times 3 = 4 \times 4 \times h$

9 = 4 h ⇒ h = $\frac{9}{4}$ cm

Hence , The water level in the vessel will rise = $\frac{9}{4}$ cm

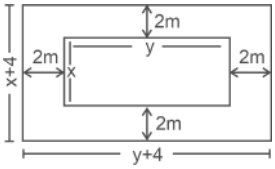
Sol.26.(d) Area of the circular sheet
= $\pi \times 20^2 = 400\pi$
Area of all three smaller circles
= $3\pi \times 6^2 = 108\pi$
Area of the uncut portion = (400 - 108)π
= 292 π
Ratio of uncut portion to cut portion
= 292π : 108 π ⇒ 73 : 27

Sol.27.(d)
Let, side of the cuboid are l, b and h
Volume of the cuboid = l × b × h
729 = l × b × h
sum of the squares of its three dimensions = half of its total surface area

$l^2 + b^2 + h^2 = \frac{1}{2} 2(lb + bh + hl)$

$l^2 + b^2 + h^2 = (lb + bh + hl)$
According to the above equation, all the dimensions are equal.
However, 729 is the cube of 9
So, l = b = h = 9
Whereas, the lateral surface area (L.S.A) of the cuboid is = 2(l + b)h = 2(9 + 9)9
= 324.

Sol.28.(b)
Area of rectangle = length × breadth
To find the area of rectangular plot , we should have the value of length and breadth ,
But in the question , value is not given .



Sol.29.(b) Final length of floor
= $(15 - 2 \times 1.5)$ = 12ft.
Final breadth of floor =
$(12 - 2 \times 1.5)$ = 9 ft.
Area of required floor = 12 × 9 = 108 sq .ft.
So, total cost of mat = 3.50 × 108
= 378Rs.

Sol.30.(a) A.T.Q .,

radius of the hemisphere be → $\frac{l}{2}$

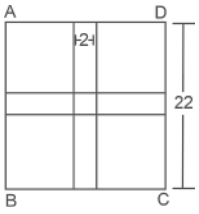
Surface area of remaining solid be → surface area of cubical sphere having each side(l) - area of the top of the spherical part + curved area of the spherical part

⇒ $6l^2 - \pi(\frac{l}{2})^2 + 2\pi(\frac{l}{2})^2$

→ $\frac{24l^2 - \pi l^2 + 2\pi l^2}{4} = \frac{24l^2 + \pi l^2}{4}$

= $(\frac{l^2}{4})(\pi + 24)$

Sol.31.(b)



Area of path = 4 × (area of rectangular path) + (area of square path)
= $4 \times (\frac{22 - 2}{2})2 + 2^2$

= 4 × 20 + 4 = 80 + 4 = 84 m^2
So, the cost of gravelling the path at the rate of ₹100/m^2 = 84 × 100 = ₹8400

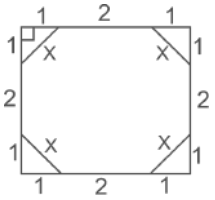
Sol.32.(b) Since, a sphere is split in the ratio 1:3. Then, volume is also divided in the same ratio.
Let the radius and height of the cone and cylinder be (R, H) and (r, h)respectively.
Then, R = H and r = h
According to question,

$\frac{Volume\ of\ cone}{Volume\ of\ cylinder} = \frac{3}{1}$

$\Rightarrow \frac{\frac{1}{3}\pi R^2 H}{\pi r^2 h} = \frac{3}{1} \Rightarrow \frac{\frac{1}{3}\pi R^2 \times R}{\pi h^2 h} = \frac{3}{1}$

$\Rightarrow \frac{1}{3} \times \frac{R^3}{h^3} = \frac{3}{1} \Rightarrow \frac{R^3}{h^3} = 9 \Rightarrow \frac{R}{h} = \frac{\sqrt[3]{9}}{1}$

Sol.33.(a) By cutting 1 cm off from each corner containing a vertex,, we have following figure :



From, the given figure, x
= $\sqrt{1^2 + 1^2} = \sqrt{2}$ cm
Perimeter of octagon formed
= $(2 + \sqrt{2})4 = (8 + 4\sqrt{2})$ cm
Area of octagon formed = Area of square - (area of right angle formed)
= $4^2 - \frac{1}{2} \times 4 \Rightarrow 16 - 2 = 14\ cm^2$

Sol.34.(b) Let the edge of the cube = a cm and side of the square = b cm
Sum of all edges of a cube = 12a cm
Perimeter of a square = 4b cm
12 a = $\frac{1}{2}$ × (4b)

$\Rightarrow 12a = 2b \Rightarrow a = \frac{1}{6}b$

According to question,

$a^3 = \frac{1}{6}b^2 \Rightarrow \frac{1}{216}b^3 = \frac{1}{6}b^2$

$\Rightarrow b = \frac{216}{6} = 36\ units$

Sol.35.(a) Diagonal of cube = $a\sqrt{3}$ = $21\sqrt{3}$
(where a is side of cube)
⇒ a = 21 cm
According to question ,
Volume of cube = Volume of cuboid
⇒ a^3 = L × B × H ⇒ 21^3= 21 × 10.5 × H
⇒ 21^2= 10.5 × H ⇒ H = 42 cm

Sol.36.(d) Perimeter of one face of cube = 4a = 24 cm , a = 6 cm
Then volume = $a^3 = 6^3 = 216\ cm^3$

Sol.37.(d) Volume of sphere
= $\frac{4}{3}\pi R^3$ (where R = radius)

$\frac{4}{3}\pi R^3 = 36\pi \Rightarrow R = \sqrt[3]{\frac{36 \times 3}{4}}$ = 3cm,
Hence, the diameter of the sphere
= 2R = 2 x 3 ⇒ 6 cm

Sol.38.(a)
Diagonal of rectangle = 65 m and length of rectangle = 63 m , Breadth of rectangle
= $\sqrt{65^2 - 63^2} = 16\ m$
Perimeter of rectangle
= $2(l + b) = 2(63 + 16) = 158\ m$

Sol.39.(c)
Diameter = 10 cm , radius = 5 cm
Total surface area of cylinder
= $2\pi R(R + h) = 2\pi \times 5 \times (5 + h) = 330$

$\Rightarrow 10 \times \frac{22}{7} \times (5 + h) = 330$

$\Rightarrow 5 + h = \frac{330 \times 7}{220} \Rightarrow 5 + h = 10.5$

$= h = 10.5 - 5 = 5.5\ cm$

Sol.40.(c) Number of solid marbles

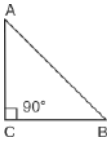
$= \frac{\frac{4}{3}\pi R^3}{\frac{4}{3}\pi r^3} = \frac{6 \times 6 \times 6}{0.3 \times 0.3 \times 0.3} = 8000$

Sol.41.(a) Area of quadrilateral
= $\frac{1}{2}$ × length of diagonal ×
(sum of corresponding altitudes)
= $\frac{1}{2}$ × 32 × (10 + 6) = 256 m²

Sol.42.(b) Semi- perimeter
= $\frac{5 + 7 + 10}{2}$ = 11
By heron's formula, area of triangle

$= \sqrt{11(11-5)(11-7)(11-10)}$
$= \sqrt{11 \times 6 \times 4 \times 1} = 2\sqrt{66}$ cm²

Sol.43.(c)



Here, AC = AB - 8 , BC = AB - 4
From Pythagoras theorem of right-angled triangle; $(AB-8)^2 + (AB-4)^2 = AB^2$
$\Rightarrow AB^2 + 64 - 16AB + AB^2 + 16 - 8AB = AB^2$
$\Rightarrow 2AB^2 - AB^2 - 24AB + 80 = 0$
$\Rightarrow AB^2 - 24AB + 80 = 0$
$\Rightarrow AB^2 - 20AB - 4AB + 80 = 0$
$\Rightarrow AB(AB-20) - 4(AB-20) = 0$
$\Rightarrow (AB-20)(AB-4) = 0$
$\Rightarrow AB = 20, 4$
AB cannot be equal to 4, therefore AB=20
Now, area of the triangle
$= \frac{1}{2} \times (20-4) \times (20-8)$
$= \frac{1}{2} \times 16 \times 12 \Rightarrow 96\ sq.\ units$

Sol.44.(d)
Let the radius of the sphere be x cm
$\Rightarrow 4 \times \frac{22}{7} \times (x+2)^2 - 4 \times \frac{22}{7} \times x^2 = 704$
$\Rightarrow 4 \times \frac{22}{7}[(x+2)^2 - x^2] = 704$
$\Rightarrow x^2 + 4x + 4 - x^2 = \frac{704 \times 7}{88}$
$\Rightarrow 4x = 56 - 4 \Rightarrow 4x = 52 \Rightarrow x = 13$
Radius of the sphere = 13 cm

Sol.45.(b) H.C.F of 12 , 24 and 30 = 6
Now, Required number of cubes
$= \frac{12}{6} \times \frac{24}{6} \times \frac{30}{6} = 2 \times 4 \times 5 \Rightarrow 40$

Sol.46.(c) Area of rhombus
$= \frac{1}{2} \times d1 \times d2 = \frac{1}{2} \times 12 \times 15 \Rightarrow 90\ cm^2$

Sol.47.(d) Area of equilateral triangle
$= \frac{\sqrt{3}}{4} \times (side)^2 = \frac{\sqrt{3}}{4} \times (side)^2 = 25\sqrt{3}$
$side = \sqrt{\frac{25\sqrt{3} \times 4}{\sqrt{3}}}$ = 10 cm

Sol.48.(a) Surface area of sphere = $4\pi r^2$
$\Rightarrow 4\pi r^2 = 36\pi \Rightarrow r^2 = 9 \Rightarrow r = 3\ cm$

Sol.49.(d) Area of equilateral triangle
$= \frac{\sqrt{3}}{4} \times side^2 = 4\sqrt{3}$ square units
$side = \sqrt{\frac{4\sqrt{3} \times 4}{\sqrt{3}}}$ = 4 units

Sol.50.(b) Length = 15 m , breadth = 17 m , height = 21 m
Area of 4 walls = 2 (length + breadth) × h
= 2 × (15 + 17) × 21 = 1344 m^2
Area of ceiling = l × b = 15 × 17 = 255 m^2
Total area which has to be painted
= 1344 + 255 = 1599 m^2
Now, cost of painting
= 1599 × 40 = ₹63,960

Sol.51.(c) Area of parallelogram
= base × height = 15 × 6 = 90cm^2

Sol.52.(a) Area of rectangle = 100 m^2
Length = 20m Breadth = $\frac{100}{20}$ = 5 m
Perimeter of rectangle
= 2 × (20 + 5) = 2 × 25 = 50 m
Cost of fencing = 50 × 30 ⇒ ₹1500

Sol.53.(d) Area of walls and ceiling
$= \frac{7440}{60} \Rightarrow 124\ m^2$
Area of four walls + area of ceiling = 124
⇒ 2 × (5 + 3) × height + 5 × 3 = 124
$\Rightarrow 16 \times height = 124 - 15$
$\Rightarrow 16h = 109$ ⇒ h = 6.8 m

Sol.54.(d) Volume of cube
= 18 × 18 × 18 = 5832 m^3
Now, Width of cuboid = $\frac{5832}{27 \times 7} \Rightarrow 30.8\ m^3$

Sol.55.(a) Required number of cylinder
$= \frac{\pi R^2 H}{\pi r^2 h} = \frac{20 \times 20 \times 100}{10 \times 10 \times 20} \Rightarrow 20$

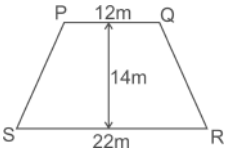
Sol.56.(b) Let the radius and height of the cylinder are 2x and x $\Rightarrow 2\pi r h = 616$
$\Rightarrow 2 \times \frac{22}{7} \times 2x \times x = 616$
$\Rightarrow x = \sqrt{\frac{616 \times 7}{88}} = \sqrt{49} = 7$
Radius = 14 m and height = 7 m
T.S.A = $2\pi r(r+h)$
$= 2 \times \frac{22}{7} \times 14 \times 21 = 1848\ m^2$

Sol.57.(b) Volume of cuboid = length × breadth × height = 12 × 10 × 15 = 1800 m^3

Sol.58.(a) Area of parallelogram = base × perpendicular dist. = 12 × 8 ⇒ 96 cm^2

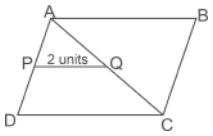
Sol.59.(c) Total surface area of cuboid = 2(lb + bh + hl)
⇒ 2 (16 × 12 + 12 × 8 + 8 × 16)
⇒ 2 × (192 + 96 +128) = 2 × 416 = 832 cm²

Sol.60.(a)



Area of trapezium
$= \frac{1}{2}$ × (sum of parallel sides) × height
$= \frac{1}{2}$ × (12 + 22) × 14 = 238 m²
Then, the required area = $\frac{238}{2}$ = 119 m²

Sol.61.(a)



PQ = 2 units
Using mid-point theorem,
DC = 2 × $PQ = 2 \times 2 = 4$ units
Perimeter of parallelogram = 2 × (sum of adjacent sides) = $2 \times (AD + DC) = 20$ units ⇒ $2 \times (AD + 4) = 20$
⇒ AD = 6 units

Sol.62.(a) Length = 12 cm , breadth = 3 cm , height = 6 cm
T.S.A = 2(lb + bh + hl)
= 2(36 + 18 + 72) = 2 × 126 ⇒ 252 cm²

Sol.63.(b)

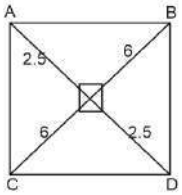
Radius	10	:	11
Height	5	:	3
C.S.A	50	:	33

17

Decrease % in C.S.A = $\frac{17}{50} \times 100 = 34\%$

Sol.64.(b) T.S.A of cube = $6a^2$
$\Rightarrow 6a^2 = 1014 \Rightarrow a^2 = 169 \Rightarrow a = 13$
Hence, side of the cube = 13 cm

Sol.65.(b)



9.369

$Side\ of\ the\ rhombus = \sqrt{6^2 + 2.5^2} = 6.5\ cm$
Perimeter of rhombus = 4 × 6.5 = 26 cm

Sol.66.(c)
Diameter of sphere = 42 m ,Radius = 21m
,Volume of sphere = $\frac{4}{3}\pi R^3$
$= \frac{4}{3} \times \frac{22}{7} \times 21 \times 21 \times 21 \Rightarrow 38,808\ m^3$

Sol.67.(c) External radius (R) = 9 cm , Internal radius (r)= (9- 2) = 7 cm
Now, Volume of Sphere =

$\frac{4}{3} \times \pi \times (r)^3 = \frac{4}{3} \times \frac{22}{7} \times 7^3$

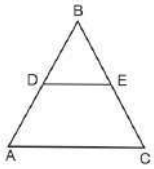
$\Rightarrow \frac{4}{3} \times \frac{22}{7} \times 7 \times 7 \times 7 \Rightarrow 1437.33\ cm^3$

Sol.68.(b) Volume of cube = side ³
ATQ , ⇒ side³ = 216
⇒ side = 6
Five cubes are joined in a linear manner
Then, the length of cuboid = 5 × 6 = 30 cm
Therefore, lateral surface area of the cuboid = 2 (L + B) × H = 2 (30 + 6) × 6
⇒ 2 × 36 × 6 = 432 cm²

Sol.69.(b) Area of square = side²
Side² = 900 ⇒ Side = 30 cm
Perimeter of square = 4 × 30 = 120 cm
ATQ, Perimeter of a regular hexagon
= perimeter of square 6a = 120 , a = 20
Area of hexagon
= $6 \times \frac{\sqrt{3}}{4} \times 20 \times 20 = 600\sqrt{3}$ cm²

Sol.70.(c) Area of trapezium
$= \frac{1}{2} \times (sum\ of\ parallel\ sides) \times height$
$= \frac{1}{2} \times 8 \times 6 = 24\ unit$

Sol.71.(b)



Given, BD = 4 cm and AD = 2√2 cm,
$\frac{ar(\Delta BDE)}{ar(\Delta ABC)} = (\frac{BD}{AB})^2 = (\frac{4}{2\sqrt{2}+4})^2$
$= \frac{16}{16+8+16\sqrt{2}} = \frac{2}{3+2\sqrt{2}}$
$So, area\ of\ ADEC = 3 + 2\sqrt{2} - 2$
$= 1 + 2\sqrt{2}$
$\frac{ar(\Delta BDE)}{ar(trADEC)} = 2 : (1 + 2\sqrt{2})$

Sol.72.(d) From pythagoras theorem,
$(x-2)^2 + (x-4)^2 = x^2$
$\Rightarrow x^2 + 4 - 4x + x^2 + 16 - 8x = x^2$
$\Rightarrow x^2 - 12x + 20 = 0$
$\Rightarrow x^2 - 10x - 2x + 20 = 0$
$\Rightarrow (x-10)(x-2) = 0$
$\Rightarrow x = 10\ or\ 2$
Now, sides are
10, (10 - 2), (10 - 4) = 10,8,6
Area of triangle = $\frac{1}{2} \times 8 \times 6 = 24\ cm^2$

Sol.73.(b) Diameter of base
= 14 m , radius = 7 m
C.S.A of cylinder = 2 π r h
= $2 \times \frac{22}{7} \times 7 \times 24 = 1056\ cm^2$

Sol.74.(d) Vol of hemisphere = $\frac{2}{3} \pi r^3$
$\frac{2}{3} \times \frac{22}{7} \times 7 \times 7 \times 7 = 718.67\ cubic\ cm$

Sol.75.(a) Required number of dices
$= \frac{Volume\ of\ cuboid}{Volume\ of\ a\ dice} = \frac{4 \times 10 \times 15}{2 \times 2 \times 2} = 75$

Sol.76.(c) Diameter of sphere = 14cm, radius = 7cm
Surface area of sphere = $4 \pi r^2$
$= 4 \times \frac{22}{7} \times 7 \times 7 \Rightarrow 616\ cm^2$

Sol.77.(c) Length = 2.5 m , breadth = 2 m ,height = 0.9 m
T.S.A = $2(lb + bh + hl)$
$= 2(5 + 1.8 + 2.25)$
$= 2 \times 9.05 = 18.1\ m^2$
Now, cost of canvassing = 18.1 × 80
= ₹1,448

Sol.78.(c) Volume of cube = side³
⇒ 8 × 8 × 8 = 512 cm^3

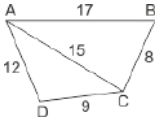
Sol.79.(a) volume of large sphere = 27 × volume of small sphere
Now,
Let the radius of small sphere = r
⇒ $\frac{4}{3} \pi \times 12 \times 12 \times 12 = 27 \times \frac{4}{3} \pi r^3$
⇒ r³ =4 × 4 × 4 So r = 4 cm
Required ratio
= 4π × 12× 12 : 6 × 4π × 4 × 4 ⇒ 3 : 2

Sol.80.(c) Volume of cylinder = πr²h
By ratio,

	V		V'
r(-20%) →	5	:	4
r(-20%) →	5	:	4
h(+125%)→	4	:	9
	100	:	144

Required % = $\frac{44}{100} \times 100$ = 44%

Sol.81.(a)



In ΔADC
12 ,9 and 15 is a triplet.
Then, the area of ΔADC
= $\frac{1}{2}$ × 12 × 9 = 54 cm²
In ΔABC 15 , 8 and 17 is a triplet.
Then, the area of ΔABC
= $\frac{1}{2}$ × 15 × 8 = 60 cm²
Therefore, area of quadrilateral ABCD = 60+ 54 = 114 cm²

Sol.82.(a) Given, 2πr = 136.4
⇒ $2 \times \frac{22}{7} \times r = 136.4 \Rightarrow r = 21.7$ cm
Volume of cylinder = πr²h
⇒ $\frac{22}{7} \times 21.7 \times 21.7 \times 50 = 73997$

Sol.83.(a) Volume of sphere →
$\frac{4}{3} \pi (9^3 - 8^3) = \frac{4}{3} \times \frac{22}{7} \times 217$
Therefore weight of sphere(in kg)
$= \frac{\frac{4}{3} \times \frac{22}{7} \times 217 \times 6}{1000}$
$\Rightarrow \frac{4 \times 22 \times 31 \times 2}{1000} = 5.456$

Sol.84.(b) Volume of cylinder = $\pi R^2 h$
$= \frac{22}{7} \times 10 \times 10 \times 21 = 6600\ cm^3$

Sol.85.(b) Area of adjacent faces ,
$l \times b = 11 \times 6 = 66\ cm^2$
$b \times h = 6 \times 18 = 108\ cm^2$
$h \times l = 18 \times 11 = 198\ cm^2$
Length = 11 cm , breadth = 6 cm and height = 18 cm
Now, Volume of cuboid
= $lbh = 11 \times 6 \times 18 = 1188\ cm^3$

Sol.86.(d)
Given, diagonal of cube = $16\sqrt{3}\ cm$
Side of cube = $\frac{16\sqrt{3}}{\sqrt{3}} = 16\ cm$
T.S.A of cube
= $6 \times side^2 = 6 \times 16 \times 16 = 1536\ cm^2$

Sol.87.(b) $\frac{\frac{4}{3}\pi R^3}{\frac{4}{3}\pi r^3} = \frac{216}{125}$
$\Rightarrow \frac{R^3}{r^3} = \frac{216}{125} \Rightarrow \frac{R}{r} = \sqrt[3]{\frac{216}{125}} = \frac{6}{5}$
Ratio of surface area
= $\frac{4 \pi R^2}{4 \pi r^2} = (\frac{6}{5})^2 = \frac{36}{25}$

Sol.88.(a) Surface area of sphere = 4πr²
⇒ $4 \times \frac{22}{7} \times 3.5 \times 3.5 \Rightarrow 154$ cm²

Sol.89.(c) C.S.A of a cylinder = 2πrh
$\frac{2\pi rh}{r} = \frac{1848}{19.6} \Rightarrow 2 \times \frac{22}{7} \times h = \frac{1848}{19.6}$
$\Rightarrow h = \frac{42}{2.8}$ Therefore , h = 15 cm

Sol.90.(c) The volume of a sphere
= $\frac{4}{3} \pi r^3 = \frac{4}{3} \times \pi \times 6 \times 6 \times 6 = 288\pi$ cm³

Sol.91.(d)
Given volume of the cube = 512 cm^3
Then side of the cube = $\sqrt[3]{512}$ = 8 cm
Now, diagonal of the cube

$= \sqrt{3} \times side = 8\sqrt{3}\ cm$

Sol.92.(a) Surface area of sphere $= 4\pi R^2$

$4\pi R^2 = 196\pi \Rightarrow R = \sqrt{\frac{196}{4}} = 7\ cm$

Volume of the sphere $= \frac{4}{3}\pi R^3$

$= \frac{4}{3}\pi \times 7 \times 7 \times 7 = \frac{1372\,\pi}{3}\ cm^3$

Sol.93.(a) Total surface area of a solid hemisphere = $3\pi R^2$

$3\pi R^2 = 42 \Rightarrow 3 \times \frac{22}{7} \times R^2 = 42$

$\Rightarrow R = \sqrt{\frac{42 \times 7}{3 \times 22}} = \frac{7}{\sqrt{11}}$ cm

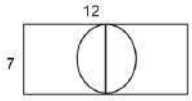
Sol.94.(b)
Length = 6 m, breadth = 4 m, height = 3m
T.S.A = 2 (lb + bh + hl)
= 2(24 + 12 + 18) = 108 cm^2
Since, the cuboid is open, then internal surface area = 108 - (6 × 4) = 108 - 24
= 84 cm^2

Sol.95.(d) Diameter = 2 cm , radius = 1 cm, height = 700 cm
Volume of cylinder = $\pi R^2 h$
$= \frac{22}{7} \times 1 \times 1 \times 700 = 2200\ cm^3$

Sol.96.(a) Let the length and breadth of the rectangle be 3x and x.
$2(3x + x) = 40 \Rightarrow 8x = 40 \Rightarrow x = 5$
Length = 15 m and breadth = 5 m
Cost of tiling = 24 × (15 × 5) ⇒ ₹1,800

Sol.97.(d) C.S A of cylinder = 2 π R h
2πRh = 2800
$R = \frac{2800 \times 7}{2 \times 22 \times 100} = 4.45\ cm$
Hence, the outer radius of the cylindrical rod = 4.45 cm

Sol.98.(c)



Diameter of the circle = 7 m , radius of the circle = 3.5 m
Circumference of the circle = 2 π R
$= 2 \times \frac{22}{7} \times \frac{7}{2} \Rightarrow 22\ m$

Sol.99.(d) Length of the diagonal = $10\sqrt{3}$
Side of the cube = $\frac{Diagonal}{\sqrt{3}} = \frac{10\sqrt{3}}{\sqrt{3}}$
$= 10\ cm$
T.S.A of cube = $6side^2$
$= 6 \times 10 \times 10 = 600\ cm^2$

Sol.100.(d) Area of parallelogram
= base × height = 10 × 6 = 60 cm^2

Sol.101.(a) Let the length of the rectangle be x and breadth be y.
$x = 4y + 4 \Rightarrow y = \frac{x-4}{4}$
Area of the rectangle = length × breadth
$\Rightarrow xy = 225 \quad \Rightarrow x \times \frac{x-4}{4} = 225$
$\Rightarrow x^2 - 4x = 900$
$\Rightarrow x^2 - 4x - 900 = 0$

Sol.102.(d) Given, side of the cube = 4 m
T.S.A of the cube = $6 \times side^2$
$= 6 \times 4 \times 4 \Rightarrow 96\ m^2$

Sol.103.(c)
From the properties of similar triangle,
The ratio of the area of two similar triangles is equal to the squares of the ratio of its corresponding sides.
So, ratio of area of the triangles
$= 2^2 : 1^2 \Rightarrow 4 : 1$

Sol.104.(b) Ratio of volume,
$\frac{\frac{4}{3}\pi R^3}{\frac{4}{3}\pi r^3} = \frac{27}{8} \Rightarrow \frac{R}{r} = \sqrt[3]{\frac{27}{8}} = \frac{3}{2}$
Now, ratio of surface area
$= \frac{4\pi R^2}{4\pi r^2} = (\frac{3}{2})^2 = \frac{9}{4}\ or\ 9 : 4$

Sol.105.(a) Let the radius of the sphere be R1= r , new radius (R2) = r/2
$\frac{V2}{V1} = \frac{\frac{4}{3}\pi(R2)^3}{\frac{4}{3}\pi(R1)^3} = \frac{\frac{r^3}{8}}{r^3} = \frac{1}{8}$
Hence, the new volume will become $\frac{1}{8}$ times.

Sol.106.(c) Given,
base of the triangle = 3 cm
Area of triangle = $\frac{1}{2} \times base \times height$
$\Rightarrow \frac{1}{2} \times 3 \times height = 4$
$\Rightarrow height = \frac{8}{3} = 2\frac{2}{3}$cm

Sol.107.(d) Given, side of the square]
= (5x - 8) cm
Then, the area of the square = side × side
$= (5x - 8)^2 = 25x^2 - 80x + 64$

Sol.108.(a)
Curved surface area of cylinder = 2πrh
880 = $2 \times \frac{22}{7} \times \frac{7}{2} \times$ h ⇒ h = 40 cm

Sol.109.(b) Radius = 10 cm
According to the question,
$\frac{4}{3} \times \pi \times 10 \times 10 \times 10 = \frac{4}{3} \times \pi \times r^3 \times 1000$
r = 1 , Diameter = 2r = 2 × 1 = 2 cm

Sol.110.(c)
Let breadth = x, Length = x +22
As per question,
Area = x(x + 22)
1400 = x^2 + 22x
x^2 + 22x - 1400 = 0
x^2 + 50x - 28x - 1400 = 0
x(x + 50) - 28(x + 50) = 0
(x - 28) (x + 50) = 0
x = 28 (length can't be negative)
So, breadth = 28

Sol.111.(c)
Diameter = 12 cm, Radius = 6 cm
Volume of the sphere
$= \frac{4}{3} \times \frac{22}{7} \times 6 \times 6 \times 6 = 905\frac{1}{7}$ cm^3

Sol.112.(b) Given,
Height of the cylinder = 1.05 m , radius = 35 cm or 0.35 m
T.S.A of the cylinder = $2\pi R(R + H)$
$= 2 \times \frac{22}{7} \times 0.35 \times (0.35 + 1.05)$
$= 2 \times \frac{22}{7} \times 0.35 \times 1.4 = 3.08\ m^2$
Hence, the cost of the material required
= 3.08 × 150 = ₹462

Sol.113.(a)
Volume of the sphere = $\frac{4}{3}\pi R^3$
Surface area of sphere = $4\pi R^2$
According to question,
$\frac{\frac{4}{3}\pi R^3}{4\pi R^2} = 9 \Rightarrow R = 27\ cm$

Sol.114.(d) Given, height of the drum = 7m, internal diameter of the drum = 21 m
Surface area of the drum to be painted
$= 2\pi R h + \pi R^2$
$= 2 \times \frac{22}{7} \times \frac{21}{2} \times 7 + \frac{22}{7} \times \frac{21}{2} \times \frac{21}{2}$
$= 462 + 346.5 \Rightarrow 808.5\ m^2$

Sol.115.(d)
Ratio of the areas of two squares = 2 : 3
Ratio of its sides = $\sqrt{2} : \sqrt{3}$
Now, ratio of its perimeter
$= 4 \times \sqrt{2} : 4 \times \sqrt{3} = \sqrt{2} : \sqrt{3}$

Sol.116.(b)
Curved surface area of cylinder = 2 πRh
$\Rightarrow 2\pi R_1 h_1 = 2\pi R_2 h_2$
$\Rightarrow 2\pi 4 \times 4 = 2\pi 16 \times h$
$\Rightarrow h = 1\ cm$

Sol.117.(c) Slant height = 28 cm
Radius = 21 cm

Height = $\sqrt{28^2 - 21^2} = 7\sqrt{7}$

Volume = $\frac{1}{3} \times \frac{22}{7} \times 21 \times 21 \times 7\sqrt{7}$

$= 3234\sqrt{7}$

Sol.118.(d) Let the side of cube = 2 unit
Surface area of cube = $6a^2 = 6(2)^2 = 24$
New side of cube = 3 unit
Surface area of new cube = $6a^2 = 6(3)^2$
$= 54$

Percentage increase = $\frac{54-24}{24} \times 100$
$= 125\%$

Trick :- Successive increase of percent
$= (50 + 50 + \frac{50 \times 50}{100}) = 125\%$

Sol.119.(d) Given, area of the triangle = 25000 m^2 and length of the base = 500 m
Area of the triangle = $\frac{1}{2} \times base \times height$

$\Rightarrow \frac{1}{2} \times 500 \times height = 25000$

$\Rightarrow height = \frac{25000 \times 2}{500} = 100$
So, the height of the triangle = 100 m

Sol.120.(b) Required number of cuboids
$= \frac{20 \times 25 \times 10}{2 \times 1.25 \times 1} = 2000$

Sol.121.(a)
Perimeter of a semicircle = r (π + 2)

$\Rightarrow r(\frac{22}{7} + 2) = 72$

$\Rightarrow r = \frac{72 \times 7}{36} = 14$ cm

Now, area of the semicircle = $\frac{1}{2}(\pi r^2)$

$= \frac{1}{2} \times \frac{22}{7} \times 14 \times 14 \Rightarrow 308\ cm^2$

Sol.122.(a) When three cubes are arranged next to each other then,
Length = 15 cm, breadth = 5 and height = 5 cm, T.S.A of cuboid = 2 (lb + bh + hl)
= 2 (75 + 25 + 75) = 2 × 175 ⇒ 350 cm^2

Sol.123.(c) Sides of triangles = 26 cm , 28 cm , 30 cm

S = $\frac{26 + 28 + 30}{2} = 42$

Area of triangle
$\sqrt{s(s-a)(s-b)(s-c)}$
$= \sqrt{42 \times (42-26)(42-28)(42-30)}$
$= \sqrt{42 \times 16 \times 14 \times 12} = 336\ cm^2$
Now, area of parallelogram
= base × height

$\Rightarrow height = \frac{336}{28} = 12\ cm$

Sol.124.(a)

V	:	V'
1	:	3
1	:	3
1	:	27

Therefore option (a) is the right answer.

Sol.125.(c) Total surface of cube = $6a^2$
⇒ 6 × 5 × 5 = 150 cm^2

Sol.126.(c) Radius of the cylinder are 2 cm and 3 cm and height is the same.
Volume of cylinder = $\pi r^2 h$
V1 : V2 = $\pi \times 2 \times 2 \times h : \pi \times 3 \times 3 \times h$
$= 4 : 9$

Sol.127.(d) Let the breadth of the rectangle be x m and length of the rectangle be x + 5 m

$2(x + x + 5) = \frac{2250}{3}$

$\Rightarrow 4x = 750 - 10 \Rightarrow 4x = 740$

$\Rightarrow x = 185$
Hence, the length of the rectangle
= x + 5 = 190 m

Sol.128.(a) Volume of cylinder = $\pi R^2 h$
$= 5 \times 5 \times 2\pi = 50\pi$
Required number of cylindrical coins

$= \frac{50\pi}{\pi \times 0.5 \times 0.5 \times 0.2} \Rightarrow 1000$

Sol.129.(a)

Area of regular hexagon = $6 \times \frac{\sqrt{3}}{4} \times a^2$

$\Rightarrow 6 \times \frac{\sqrt{3}}{4} \times 4 \times 4 = 24\sqrt{3}\ cm^2$

Sol.130.(b) side of each cube = a = 7cm
Volume of each cube = $a^3 = 7^3 = 343\ cm^3$
Volume of Six equal cubes = 6 × 343
= 2058 cm^3

Sol.131.(a)
Perimeter of a square = 44 cm
Side of square = 11 cm = radius of circle
Perimeter of circle = 2πr = 22π

Sol.132.(d)
Total surface area of cube = $6\ a^2$
Lateral surface area of cube = $4\ a^2$
$6\ a^2 - 4\ a^2 = 4050 \Rightarrow 2a^2 = 4050$

$\Rightarrow a = \sqrt{2025} = 45$
Hence, the length of each side of the cube is 45 units.

Sol.133.(a) Let the radius of the base be x cm, then height be 2x cm
Area of the base of the cylinder = πR^2

$\Rightarrow \frac{22}{7} \times R^2 = 3850$

$\Rightarrow R = \sqrt{\frac{3850 \times 7}{22}} = 35\ cm$
Then height of the cylinder = 70 cm
Hence, the volume of the cylinder
$= \pi R^2 h = \frac{22}{7} \times 35 \times 35 \times 70$
$= 269500\ cm^3$

Sol.134.(b) Given,
radius of the sphere = 9 cm,
Surface area of sphere = $4\ \pi \times R^2$
$= 4 \times \frac{22}{7} \times 9 \times 9 \Rightarrow 1018\frac{2}{7}$ cm^2

Sol.135.(b) Let the radius of ball = r
ATQ,
Volume of large sphere =
8 × volume of small sphere (ball)
$\frac{4}{3} \times \pi \times 10^3 = 8 \times \frac{4}{3} \times \pi \times r^3$

$\Rightarrow r^3 = \frac{1000}{8}$, so , r = 5
Surface area of each ball
$= 4 \times \frac{22}{7} \times 5 \times 5 = \frac{2200}{7} = 314\frac{2}{7}$ cm^2

Sol.136.(b) Given , r = 7 cm and h = 15cm
Now,
Volume of cylinder = $\pi r^2 h$
$= \frac{22}{7} \times 49 \times 15 = 2310\ cm^3$

Sol.137.(d) volume of cuboid = lbh
L : B : H = 1 : 2 : 3
1k × 2k × 3k = 1296
$k^3 = 216 = 6$
Therefore l = 6 , b = 12 and h = 18
Now, the surface area of cuboid
= 2 (lb + bh + hl)
⇒ 2 (72 + 216 +108) = 792 cm^2

Sol.138.(b) Volume of sphere = 4851
$\frac{4}{3} \times \frac{22}{7} \times r^3 = 4851,$
$r^3 = 1157.625 \Rightarrow r = 10.5$

Sol.139.(c) Base area of cylinder = 346.5
$\frac{22}{7} \times r^2 = 346.5$, r = 10.5
Total surface area = 2πr(h + r)
$= 2 \times \frac{22}{7} \times 10.5(21 + 10.5)$
$= 2 \times \frac{22}{7} \times 10.5 \times 31.5 = 2079$

Sol.140.(c) Length of cuboid
= 15 m and width = 10 m
According to the question,
Sum of the areas of the floor and the ceiling = area of the four walls
l × b + l × b = 2(l + b) × h
10 × 15 + 10 × 15 = 2(10 + 15) × h
300 = 50 × h, h = 6 m
Volume of the hall = 15 × 10 × 6 = 900 m^3

Sol.141.(b) Diameter = 38.5 cm
Circumference of circle = 2πr
$= 2 \times \frac{22}{7} \times \frac{38.5}{2} = 121$ cm

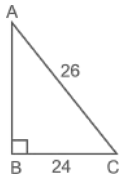
Sol.142.(b) Area of cuboid which has to be painted = 2(lb +bh + hl) - lb
=2 (4 × 3.6 + 3.6 × 1.5 + 1.5 × 4) - 4 × 3.6
= 2× (14.4 + 5.4 + 6) - 14.4
= 51.6 - 14.4 = 37.2 m^2
Now, cost of painting = 37.2 × 55 = ₹ 2046

Sol.143.(c) Let the length of rectangle = 3x
Width of rectangle = x
According to the question,
⇒ 2(3x + x) = 64 ⇒ 8x = 64 ⇒ x = 8
Hence, Width of rectangle = 8 cm

Sol.144.(a)
Radius = 2 cm, Height = 10 cm
Total surface area = 2πr(h + r)
= 2 × π × 2(10 + 2) = 48π cm^2

Sol.145.(c) Radius = 3.5 cm
Total surface area = 269.5
2πr(h + r) = 269.5
= 2 × $\frac{22}{7}$ × 3.5 × (h + 3.5) = 269.5
= h + 3.5 = 12.25 = h = 8.75
Diameter = 2 × 3.5 = 7 cm
Required ratio = 8.75 : 7 or 875 : 700 ⇒ 5 : 4

Sol.146.(b)



According to pythagoras theorem,
AB^2 = 26^2 - 24^2
AB = 10 cm
Area of triangle = $\frac{1}{2}$ × 10 × 24 = 120 cm^2

Sol.147.(c) Side of cube = 5 cm
Volume of cube = a^3 = 5^3 = 125 cm^3
Volume of cuboid = 5 × 2 × 8 = 80 cm^3
Volume of the toy = 125 + 80 = 205 cm^3

Sol.148.(c) Let the smallest side= x
and 2nd side = 2x + 7,Third side = 3x + 5
Perimeter of the triangle = 90
According to the question,
x + 2x + 7 + 3x + 5 = 90
6x + 12 = 90, 6x = 78, x = 13
Hence, length of the smallest side = 13 m

Sol.149.(c) According to the question,
9 × 32 × 48 = 8 × a^3
a^3 = 1728 ⇒ a = 12
Lateral surface area of cube
= 4 × (a)² = 4 × 12^2 = 576
Sum of the lateral surface area
= 5 × 576 = 2880

Sol.150.(c) According to question,
Radius = height,
Volume of cylinder = π × r^2 × h =814
814 = $\frac{22}{7}$ × h^2 × h
⇒ h^3= 259 ⇒ h = $\sqrt[3]{259}$ cm

Sol.151.(b) Sides = 42, 36 and 34
S = $\frac{42+36+34}{2}$ = 56
Area of triangle =
$\sqrt{56 \times (56-42) \times (56-36) \times (56-34)}$
Area of triangle = $\sqrt{56 \times 14 \times 20 \times 22}$
Area of triangle
= $\sqrt{4 \times 14 \times 14 \times 4 \times 5 \times 2 \times 11}$
Area of triangle = 56$\sqrt{110}$

Sol.152.(d) Radius = 10.5 cm
Let the number of obtained small sphere= n , According to the question,
$\frac{4}{3}$ × π × 10.5 × 10.5 × 10.5
= n × $\frac{4}{3}$ × π × 3.5 × 3.5 × 3.5 ⇒ n = 27

Sol.153.(d)
Total surface area of a hollow hemisphere = 2π(R^2 + r^2) + π(R^2 − r^2)
= 2π(10^2 + 5^2) + π(10^2 - 5^2)
= 250π + 75π = 325 π

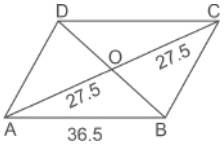
Sol.154.(c) Surface area of sphere = 4πr^2
1144 = 4 × $\frac{22}{7}$ × r^2 ⇒ r^2 = 91 ⇒ r = $\sqrt{91}$
Diameter = 2$\sqrt{91}$

Sol.155.(b) Let height = x and base = 2x
Area of triangle = $\frac{1}{2}$ × base × height
81 = $\frac{1}{2}$ × 2x × x ⇒ 81 = x^2, ⇒ x = 9
So, Height = 9 cm

Sol.156.(b) Volume of sphere
= $\frac{4}{3}$ × $\frac{22}{7}$ × r^3
$\frac{792}{7}$ = $\frac{4}{3}$ × $\frac{22}{7}$ × r^3 ⇒ r^3 = 27 ⇒ r = 3
So, radius of sphere = 3 cm

Sol.157.(b) Perimeter of right angle triangle = 80 m, Hypotenuse = 34 cm
Let the other two sides = a and b
According to question,
34 + a + b = 80, a + b = 46
We know,] a^2 + b^2 = 34^2
According to option, possible value of a and b = 16 , 30

Sol.158.(b) Perimeter of rhombus = 146
4a = 146, a = 36.5



We know,
Diagonals of rhombus cut at 90°
OB = $\sqrt{(36.5)^2 - (27.5)^2}$ = 24
OD = Diagonal = 2 × 24 = 48
Area of rhombus = $\frac{1}{2}$ × 55 × 48 = 1320

Sol.159.(a) Area of trapezium
= $\frac{1}{2}$ × (sum of parallel sides) × distance
160 = $\frac{1}{2}$ × (20 + 12) × distance
320 = 32 × distance
Distance = 10
So, perpendicular distance between the parallel sides = 10 cm

Sol.160.(c) Volume of sphere
= $\frac{4}{3}$ × $\frac{22}{7}$ × $\frac{7}{4}$ × $\frac{7}{4}$ × $\frac{7}{4}$ = 22.46

Sol.161.(d) Let width = w and length = w + 5
Area = 215 cm^2
According to question,
⇒ w(w + 5) = 215 ⇒ w^2 + 5w − 215 = 0
So, option (d) is correct.

Sol.162.(a) According to question,
3 × $\frac{2}{3}$ × $\frac{22}{7}$ × 2 × 2 × 2
= $\frac{4}{3}$ × $\frac{22}{7}$ × r^3, r^3 = 12, r = $\sqrt[3]{12}$

Sol.163.(d) Area of triangle
= $\frac{1}{2}$ × 126.4 × 54.8 = 3463.36

Sol.164.(d) S = $\frac{10+12+14}{2}$ = 18
Area of triangle
= $\sqrt{S(s-a)(s-b)(s-c)}$
Area of triangle
= $\sqrt{18(18-10)(18-12)(18-14)}$
Area of triangle
= $\sqrt{18 \times 8 \times 6 \times 4}$ = 24$\sqrt{6}$

Sol.165.(b)
Area of triangle= $\frac{1}{2}$× base × height
85 = $\frac{1}{2}$× 5 × height ⇒ Height = 34 cm

Sol.166.(d)
Let height = x and base = x + 3
Hypotenuse = 15
The given triangle is a right angled triangle. So, possible value of x = 9 m, height = 9 m and base = 12 m
Area = $\frac{1}{2}$ × 9 × 12 = 54 m^2

Sol.167.(b) According to the question,
Circumference = 308
2πr = 308
2 × $\frac{22}{7}$ × r = 308 ⇒ r = 49 m

Area of circle= $\pi r^2 = \frac{22}{7} \times (49)^2 = 7546\ m^2$

Short Tricks :- As we know that ratio of side , circumference and area of circle.

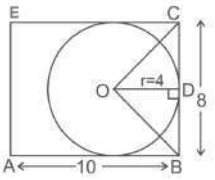
Side : circumference : Area

7k : 44 k : $154k^2$

Here , 44k = 308m ⇒ k = 7

Area = $154k^2 = 154 \times 7^2 = 7546\ m^2$

Sol.168.(b)



OD is the radius and BC is tangent to circle

OD ⊥ BC ..... (Angle between radius and tangent to circle is 90°)

Area of Δ OBC = $\frac{1}{2} \times base \times height$

= $\frac{1}{2} \times 8 \times 4$ = 16 cm²

Sol.169.(c) Outer radius (R) = 9 cm, so inner radius (r) = 9 - 1 = 8 cm

Volume of spherical shell = $\frac{4}{3}\pi(R^3 - r^3)$

= $\frac{4}{3} \times \frac{22}{7} \times (R^3 - r^3)$

= $\frac{4}{3} \times \frac{22}{7} \times (9^3 - 8^3)$

= $\frac{4}{3} \times \frac{22}{7} \times (729 - 512)$

= $\frac{4}{3} \times \frac{22}{7} \times 217 = \frac{2728}{3} = 909\frac{1}{3}\ cm^3$

Sol.170.(d) Here, r = 9 and h = 12

So, slant height (l) = $\sqrt{9^2 + 12^2}$

= $\sqrt{81 + 144} = \sqrt{225}$ = 15 m

CSA of tent = $\pi rl = \pi \times 9 \times 15 = 135\pi\ m^2$

So, cost of material

= 135 π m^2 × 100 ₹ / π m^2 = ₹13,500

Sol.171.(b) Here Radius = $\frac{12}{2}$ = 6 cm

Slant height (l) = $\sqrt{6^2 + 8^2} = \sqrt{10^2}$ = 10

According to the question,

TSA of compound object

= CSA of cone + CSA of hemisphere

⇒ $\pi rl + 2\pi r^2 \Rightarrow \pi r[l + 2r]$

⇒ π × 6[10 + 2(6)] ⇒ 6 [22]π

= 132π cm^2

So, cost of painting = 132 × 25 = ₹3,300

Sol.172.(a)

Volume of hemisphere = $\frac{2}{3}\pi r^3$

= $\frac{2}{3}\pi(3)^3 = 18\pi\ cm^3$

Sol.173.(d) Remaining area of the sheet

= 36 × 16 - $\frac{22}{7}(6^2 + 4^2 + 2^2)$

= 576 - $\frac{22}{7}(6^2 + 4^2 + 2^2)$

= 576 - $\frac{22}{7}$ × 56 = 576 - 176 = 400.

Side of square = $\sqrt{400}$ = 20 cm.

Sol.174.(c)

Diagonal of cube with side "a" = a$\sqrt{3}$

a$\sqrt{3}$ = 12, a = 4$\sqrt{3}$ cm

Volume of the cube = $a^3 = (4\sqrt{3})^3$

= $192\sqrt{3}\ cm^3$

Sol.175.(c)

Surface area of the sphere = $4\pi r^2$

= 4π $(3\sqrt{2})^2$ = 72π

Total surface area of the cone

= $\pi r(l + r)$

ATQ, $3\sqrt{2}\pi(l + 3\sqrt{2})$ = 72π

$(l + 3\sqrt{2}) = 12\sqrt{2} \Rightarrow l = 9\sqrt{2}$

Now, h = $\sqrt{l^2 - r^2}$

h = $\sqrt{(9\sqrt{2})^2 - (3\sqrt{2})^2} = \sqrt{162 - 18}$

= $\sqrt{144}$ = 12 cm.

Sol.176.(c)

Let the altitude of the triangle be "x"

Base = x + 6

$\frac{1}{2} \times (x)(x + 6) = 108$

$x^2 + 6x = 216 \Rightarrow x$ = 12 cm

Base = x + 6 = 12 + 6 = 18 cm

Sol.177.(c) Total surface area of cone

= $\pi r(r + l) = \frac{22}{7} \times 24 \times (24 + 32)$

= $\frac{22}{7}$ × 24 × (56) = 4224cm²

Sol.178.(a) According to the question

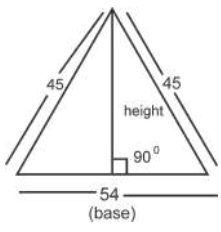
Length of diagonal = distance travelled by boy

Diagonal = 4 × $\frac{5}{18}$ × 36 = 40

Area of square = $\frac{(diagonal)^2}{2} = \frac{(40)^2}{2}$

= $\frac{1600}{2}$ = 800 m²

Sol.179.(c)



Using pythagoras theorem

Height² = 45² - $(\frac{54}{2})^2$ = 45² - 27²

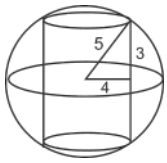
⇒ 2025 - 729 = 1296

⇒ Height = $\sqrt{1296}$ = 36cm

Area of Triangle = $\frac{1}{2}$ × base × height

⇒ $\frac{1}{2}$ × 54 × 36 = 972cm²

Sol.180.(b)



Given:

R = $\frac{5}{6}$h ⇒ $\frac{R}{h} = \frac{5}{6}$

Total height = 6 units

So half height = 3 units

Radius of sphere(R) = 5 units

By pythagoras theorem

Radius of cylinder (r) = $\sqrt{R^2 - h^2}$

= $\sqrt{25 - 9} = \sqrt{16}$ = 4 units

Now required ratio

$\frac{Volume\ of\ cylinder}{Volume\ of\ Sphere}$ = $\frac{\pi \times 4 \times 4 \times 6}{\frac{4}{3}\pi \times 5 \times 5 \times 5}$

= $\frac{72}{125}$

Sol.181.(c) Area of trapezium

= $\frac{1}{2}(sum\ of\ parallel\ sides) \times height$

= $\frac{1}{2} \times (18 + 15) \times 12 = 198\ cm^2$

Sol.182.(b)

Total surface area of cylinder = 2πr(r + h)

Total surface area of sphere = 4πR²

Now according to the question

2πr(r + h) = $\frac{4\pi R^2}{2} \Rightarrow$ r(r + h) = R^2

⇒ 4(4 + h) = (8 × 8) ⇒ h = 16 - 4 = 12 cm

Sol.183.(c) In any square

Side = a, Area = a²

a² = 81x² + 72x + 16

81x² + 36x + 36x + 16

9x(9x + 4) + 4(9x + 4)

(9x + 4)²

Side = a = (9x + 4) = 2($\frac{9x}{2}$ + 2)

Sol.184.(a) Surface area of sphere = 4πr²

61600 = 4 × $\frac{22}{7}$ × r²

r² = 4900 ⇒ r = 70

Volume of sphere = $\frac{4}{3} \times \frac{22}{7}$ × 70 × 70 ×

70 = $\frac{49000 \times 88}{3}$cu. cm = $\frac{49000 \times 88}{3}$

= $\frac{43,12,000}{3}$ or $\frac{4.312}{3}$ cu.m

Sol.185.(a) Difference between the outer and inner circumference = 2π(R - r)

33 = 2 × $\frac{22}{7}$ × (R - r)

R - r = $\frac{21}{4} = 5\frac{1}{4}$

Sol.186.(b) Side of the cube = 2.6 cm
Total surface of cube = $6a^2 = 6 \times (2.6)^2$
$= 40.56\ cm^2$

Sol.187.(c)
Volume of sphere = volume of cylinder
$\frac{4}{3} \times \pi \times 3 \times 3 \times 3 = \pi \times \frac{2}{10} \times \frac{2}{10} \times h$
h = 900 cm or 9 m

Sol.188.(b)
Area of rectangle = length × breadth
453.6 = 27 × breadth
Breadth = 16.8
Perimeter of rectangle = 2(l + b)
= 2(27 + 16.8) = 87.6

Sol.189.(d) Ratio of length, breadth and height = 4 : 3 : 5
Sum of length of all its edges = 144
Total edge in cuboid = 12
As per question,
4 × (4x + 3x + 5x) = 144 ⇒ x = 3
So, length = 12 cm, breadth = 9 cm and height = 15 cm
Total surface area = 2(lb + bh + lh)
= 2(12 × 9 + 9 × 15 + 12 × 15) = 846

Sol.190.(c) Slant height = 13
Area of the base = 144π
$\pi r^2 = 144\pi \Rightarrow r = 12$
$H = \sqrt{13^2 - 12^2} = 5$
Volume of cone = $\frac{1}{3} \times \pi \times 12 \times 12 \times 5$
= 240π

Sol.191.(c) Diameter = 36 cm,
radius = 18 cm, Height = 12 cm
Let number of spheres can be made = n
As per question,
$\frac{1}{3} \times \pi \times 18 \times 18 \times 12 = \frac{4}{3} \times \pi \times 3 \times 3 \times 3 \times n$
⇒ n = 36
So, number of sphere can be made = 36

Sol.192.(d)
Area of rhombus = $\frac{1}{2} \times 8 \times 16 = 64$
Area of square = Area of rhombus = 64
$a^2 = 64 \Rightarrow a = 8$
Perimeter = 4a = 4 × 8 = 32 cm

Sol.193.(c) Total surface area of solid hemisphere = 1848 cm^2
$3 \times \frac{22}{7} \times r^2 = 1848$
$r^2 = 196 \Rightarrow r = 14$
Diameter = 2 × 14 = 28 cm

Sol.194.(a) Length = 10.5 m
Width = 8 m
Area of rectangular plot = 10.5 × 8 = 84
Cost of laying grass = 84 × 15.25 = 1281

Sol.195.(d) Diameter = 10 cm, r = 5 cm
Height = 12 cm
$L = \sqrt{12^2 + 5^2} = 13$
Curved surface area of cone = πrl
= π × 5 × 13 = 65π
An additional 10% cloth is required
Area of cloth required = $65\pi \times \frac{110}{100} = 71.5\pi$

Sol.196.(a) Radius = 10 cm
Perimeter of quarter circle
$= r + r + \frac{(2\pi r)}{4}$
$= 10 + 10 + \frac{2 \times 3.14 \times 10}{4} = 35.7cm$

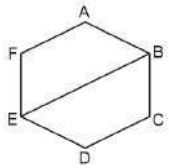
Sol.197.(b)
Volume of cylinder = $\frac{22}{7} \times (3x)^2 \times 2x$
$19404 = \frac{22}{7} \times 18x^3 \Rightarrow x = 7$
Radius = 3x = 3 × 7 = 21 and height = 2x
= 2 × 7 = 14
Curved surface area of the cylinder
$= 2 \times \frac{22}{7} \times 21 \times 14 = 1848$

Sol.198.(b) Area of base = $\pi \times r^2$
$616 = \frac{22}{7} \times r^2$
r = 14, h = 48
Slant height = $\sqrt{14^2 + 48^2} = 50$
Curved surface area of cone
$= \frac{22}{7} \times 14 \times 50 = 2200$
Cost of plastering = 2200 × 150 = 330000

Sol.199.(b)
Let the breadth of rectangle = x
Length = 3x
As per question,
$\sqrt{x^2 + (3x)^2} = 18\sqrt{10}$
$10x^2 = 3240 \Rightarrow x = 18$
Length = 3x = 3 × 18 = 54, breadth = x = 18
Perimeter = 2(54 + 18) = 144

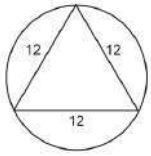
Sol.200.(b) Radius = 2 m
Height = 16.8 m
Let the radius of embankment = R
Width of embankment = R - r
As per question,
$\frac{22}{7} \times 2 \times 2 \times 16.8 = \frac{22}{7} \times (R^2 - 4) \times 0.48$
$R^2 = 144 \Rightarrow R = 12$
Width of embankment = R - r = 12 - 2 = 10

Sol.201.(c)



BE is the diagonals of the hexagon
Side of the hexagon = $\frac{14}{2} = 7$
Perimeter of hexagon = 7 × 6 = 42 cm

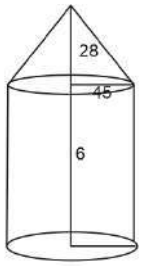
Sol.202.(b)



Radius of outer circle = $\frac{a}{\sqrt{3}} = \frac{12}{\sqrt{3}} = 4\sqrt{3}$
Area of the circle = $\pi r^2 = \pi(4\sqrt{3})^2 = 48\pi$

Sol.203.(a) Volume of cuboid = l × b × h
= 3024 = 18 × b × 12 ⇒ b = 14

Sol.204.(d)



Radius = 45 ,
Height = 28
Slant height = $\sqrt{45^2 + 28^2} = 53$
Area of canvas = Curved surface area of cylinder + Curved surface area of cone
= 2πrh + πrl
= 2π × 45 × 6 + π × 45 × 53
= 540π + 2385π = 2925π

Sol.205.(c) Radius = 10 cm
Slant height = 10.5 cm
Curved surface area of cone = πrl
$= \frac{22}{7} \times 10 \times 10.5 = 330\ cm^2$

Sol.206.(b) Area of rectangle = 7260
5x × 3x = 7260
$15x^2 = 7260 \Rightarrow x = 22$
So, Length = 5x = 5 × 22 = 110 and Breadth = 3x = 3 × 22 = 66
Perimeter of rectangle = 2(110 + 66) = 352
Perimeter of rectangle = Perimeter of circular garden
$352 = 2 \times \frac{22}{7} \times r \Rightarrow r = 56$
So, Area of circular garden
$= \frac{22}{7} \times 56 \times 56 = 9856\ m^2$

Sol.207.(a)

Volume of cone = $\frac{1}{3} \times \pi \times r^2 \times 8$

$96\pi = \frac{1}{3} \times \pi \times r^2 \times 8$

$r^2 = 36 \Rightarrow r = 6$

Slant height = $\sqrt{6^2 + 8^2} = 10$

Total surface area = $\pi r(r + l)$

$= \pi \times 6 \times (10 + 6) = 96\pi$

Sol.208.(d) As per question,

$48 \times 36 \times 30 = 15 \times 8 \times 2 \times n \Rightarrow n = 216$

Total value of hundred rupee note

$= 216 \times 125 \times 100 = 27,00,000$

Sol.209.(a) Radius = 50, Height = 150

Let the number of balloons can be filled = n

As per question,

$\pi \times 50 \times 50 \times 150 = \frac{4}{3} \times \pi \times 5 \times 5 \times 5 \times n$

$n = 2250$

Sol.210.(b) Radius = 12.5 cm

Height = $12.5 \times \frac{4}{5} = 10$

Volume of the cylinder

$= \pi \times 12.5 \times 12.5 \times 10 = 1562.5\pi$

Sol.211.(b) Radius = 0.3 mm or 0.03 cm

Volume of wire = Volume of sphere

$\pi \times \frac{3}{100} \times \frac{3}{100} \times 3200 \times 100 = \frac{4}{3} \times \pi \times r^3$

$r^3 = 216 \Rightarrow r = 6$

Surface area of the sphere

$= 4 \times \pi \times 6 \times 6 = 144\pi$

Sol.212.(c) Curved surface area of cylinder= $2\pi(R - r) \times h = 110$

$2 \times \frac{22}{7} \times (R - r) \times 7 = 110$

$(R - r) = \frac{110}{44} = 2.5$—-----(i)

Volume of cylinder = $\pi \times (R^2 - r^2) \times h = 302.5$

$\Rightarrow \frac{22}{7} \times (R + r) \times 2.5 \times 7 = 302.5$

$(R + r) = 5.5$ -------- (ii)

From (i) and (ii) r = 1.5cm

Sol.213.(a) Let the side of first square = x, Perimeter = 4x

Side of the another square = 4x, perimeter = $4 \times 4x = 16x$

As per question,

$16x - 4x = 48 \Rightarrow x = 4$

Side of the larger square = $4x = 4 \times 4 = 16$

Area of the larger square = $a^2 = 16^2 = 256$

Sol.214.(d) Volume of cuboid

$= 36 \times 25 \times 20 = 18000\ cm^3$

Volume of one cube = $4 \times 4 \times 4 = 64\ cm^3$

Total no of possible cubes

$= \frac{36}{4} \times \frac{25}{4} \times \frac{20}{4} = 9 \times 6 \times 5 = 270$

Total volume of all cubes →

$64 \times 270 = 17280\ cm^3$

So space left in this box →

$18000 - 17280 = 720\ cm^3$

Sol.215.(b) Let the height of the first cylinder and second cylinder be 'h_1' and 'h_2' respectively.

Given that, $r_1 : r_2 = 5 : 4$

ATQ, Volume of first cylinder = Volume of second cylinder

$\Rightarrow \pi r_1^2 h_1 = \pi r_2^2 h_2 \Rightarrow \frac{h_1}{h_2} = \frac{16}{25}$

So, The required percentage

$= \frac{25 - 16}{16} \times 100\% = 56.25\%$

Sol.216.(b) Let the length, width and height of the cuboid be 60x , 24x and 7x.

$\sqrt{(60x)^2 + (24x)^2 + (7x)^2} = 130$

$\sqrt{3600x^2 + 576x^2 + 49x^2} = 130$

$4225x^2 = 16900 \Rightarrow x = \sqrt{\frac{16900}{4225}}$

$= \frac{130}{65} = 2\ cm$

Volume of cuboid = l × b × h

$= (60x) \times (24x) \times (7x) = 10080 \times 2^3$

$= 80640$

Sol.217.(c) T.S.A of cylinder = $2\pi R(R + H)$

$1716 = 2 \times \frac{22}{7} \times R \times 39$

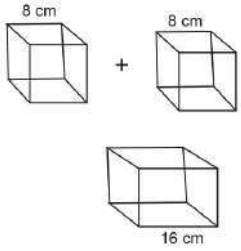
$R = \frac{1716 \times 7}{44 \times 39} = 7\ cm$

and H = 39 - 7 = 32 cm

Volume of cylinder = $\pi R^2 H$

$= \frac{22}{7} \times 7 \times 7 \times 32 = 4928\ cm^3$

Sol.218.(b) Side of cube = 8 cm,



Length of cuboid = 16 cm, breadth = 8 cm and height = 8 cm

T.S.A of cuboid = $2 \times (16 \times 8 + 8 \times 8 + 8 \times 16)$

$= 2 \times 320 = 640\ cm^2$

Sol.219.(b)

Surface area of the sphere = $4\pi R^2$

$4 \times \frac{22}{7} \times R^2 = 38.5$

$R = \sqrt{\frac{38.5 \times 7}{4 \times 22}} = \sqrt{\frac{49}{16}} = \frac{7}{4} = 1.75$ cm

Sol.220.(b) $27 \times \frac{4}{3} \pi \times R^3 = 972\pi$

$R = \sqrt[3]{\frac{972}{36}} = 3\ cm$

Total surface area of 27 spheres

$= 27 \times 4 \times \pi \times 3 \times 3 \Rightarrow 972\ \pi\ cm^2$

Sol.221.(d) Let the sides are 4x and 3x

$(4x)^2 + (3x)^2 = 225$

$25x^2 = 225 \Rightarrow x = \sqrt{\frac{225}{25}} = 3$

Perimeter of the smaller square

$= 4 \times$ side $= 4 \times 3\ (3) \Rightarrow 36$ cm

Sol.222.(c) Volume of three beads = Volume of larger bead

$\Rightarrow \frac{4}{3}\pi r_1^3 + \frac{4}{3}\pi r_2^3 + \frac{4}{3}\pi r_3^3 = \frac{4}{3}\pi R^3$

$\Rightarrow \frac{4}{3}\pi(6^3 + 8^3 + 10^3) = \frac{4}{3} \times \pi \times R^3$

$(216 + 512 + 1000) = R^3$

$\Rightarrow R^3 = 1728 \rightarrow R = 12$

Radius of the larger bead =12 cm

Sol.223.(c) $2 \times 6\ side^2 = 588$

$Side\ of\ cube = \sqrt{\frac{588}{12}} = \sqrt{49} \Rightarrow 7\ cm$

Volume of cube = $side^3 = 7 \times 7 \times 7$

$= 343\ cm^3$

Sol.224.(a) T.S.A of hemisphere = $3\ \pi R^2$

$108\ \pi = 3\ \pi R^2 \Rightarrow R = \sqrt{36} = 6\ cm$

Volume of hemisphere = $\frac{2}{3} \times \pi \times 6 \times 6 \times 6$

$= 144\ \pi\ cm^3$

Sol.225.(a) Let the length and width of rectangle be 9x and 5x

$9x \times 5x = 180 \Rightarrow 45x^2 = 180$

$\Rightarrow x = \sqrt{4} = 2$

Perimeter of the rectangle = 2 (18 + 10)

= 56 cm

Sol.226.(c)

$\frac{radius\ of\ sphere(R)}{radius\ of\ hemisphere(r)} = \frac{4}{5}$

Surface area of sphere = $4\ \pi R^2 = 64\ \pi$

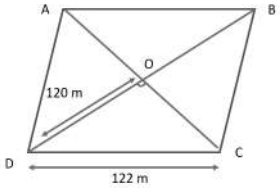
Curved surface area of hemisphere = $2\ \pi r^2$

$= 50\ \pi$

Required % = $\frac{64\pi - 50\pi}{50\pi} \times 100$

$= \frac{14\pi}{50\pi} \times 100 = 28\%$

Sol.227.(a)



Diagonals of a rhombus are perpendicular to each other.

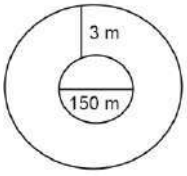
So,ΔCOD is an right angle triangle.

$\angle COD = 90°$

Length of OC = $\sqrt{122^2 - 120^2}$ = 22
Length of diagonal(AC) = 2 × OC
$= 2 \times 22 \Rightarrow 44\ m$
Area of the rhombus = $\frac{1}{2} \times 44 \times 240$
$= 5280\ m^2$

Sol.228.(a) $\frac{C.S.A\ of\ cylinder}{T.S.A\ of\ cylinder} = \frac{2}{3}$
$\Rightarrow \frac{2\pi rh}{2\pi r(r+h)} = \frac{2}{3}$
3 h = 2 (r + h) $\Rightarrow h = 2r$
Now, Total surface area
$\Rightarrow$ 231 = $2 \times \frac{22}{7} \times r\ (r + 2r)$
$3r^2 = \frac{7 \times 231}{44} \Rightarrow r = \sqrt{\frac{147}{4 \times 3}}$ = 3.5
So, r = 3.5, h = 7
Now, Volume of cylinder
$= \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 7 \Rightarrow 269.5\ cm^3$

Sol.229.(b)

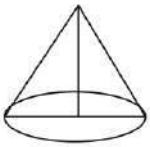


Inner circle radius = 75 m,
outer circle radius = 75 + 3 = 78 m
Area of the circular path → $\pi\left(R^2 - r^2\right)$
$= \pi\left(78^2 - 75^2\right) = \pi(6084 - 5625)$
= 459 π

Sol.230.(c)
Area of the base of cylinder = πr^2 = 1386
$\Rightarrow r = \sqrt{\frac{1386 \times 7}{22}} = 21\ cm$
Now, volume of cylinder = $\pi r^2 h$
$= \frac{22}{7} \times 21 \times 21 \times 30 \Rightarrow 41580\ cm^3$

Sol.231.(b)
Let the length of other side be x cm
$1792 = \frac{1}{2} \times (72 + x) \times 28$
$14x = 1792 - 1008 \Rightarrow 14x = 784$
$\Rightarrow x = 56\ cm$

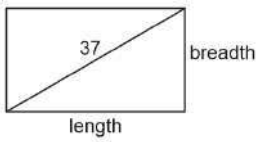
Sol.232.(b)



Radius = 70 cm, height = 240 cm ,
slant height = $\sqrt{70^2 + 240^2} = 250$ cm
Total surface area of cone = πR(l + R)
$= \frac{22}{7} \times 70 \times 320 = 70400\ cm^2 \Rightarrow 7.04\ m^2$

Sol.233.(d) $176 = 2\pi r$
$\Rightarrow 2 \times \frac{22}{7} \times r = 176$
$\Rightarrow r = \frac{176 \times 7}{44} = 28\ cm$
Total surface area of the cylinder
= 2πr(r + h) = $2 \times \frac{22}{7} \times 28 \times 40$
$= 7040\ cm^2$

Sol.234.(c)



$l^2 + b^2 = 37^2\ and\ lb = 420$
$(l + b)^2 = l^2 + b^2 + 2lb$ = 1369 + 840 = 2209
$l + b = \sqrt{2209} = 47$
Perimeter of rectangle = 2(l + b)
= 2 × 47 = 94 m
Now, cost of fencing = 94 × 37.50
= ₹ 3,525

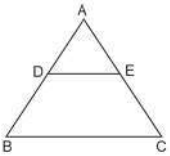
Sol.235.(a) Let the length of plot be 2x and breadth=x
D = $\sqrt{(2x)^2 + (x)^2} = 6\sqrt{5}$
$5x^2 = 180 \Rightarrow x = \sqrt{\frac{180}{5}} = 6$
Then, length = 12 m,breadth = 6 m
Perimeter of the rectangle = 2(12 + 6)
= 2 × 18 = 36 m

Sol.236.(b) Required number of spherical balls = $\frac{\pi R^2 H}{\frac{4}{3}\pi r^3} = \frac{3 \times 1.4 \times 1.4 \times 24}{4 \times 0.2 \times 0.2 \times 0.2}$
$= 4410$

Sol.237.(b) 2πR(R + H) = 704
$\Rightarrow 2\pi R(9 + R) = 704$
$\Rightarrow 18\pi R + 2\pi R^2 = 704$..... (1)
$R^2 + 9R - 112 = 0 \Rightarrow$ R = 7,−16
Volume = $\frac{22}{7} R^2 H \Rightarrow 11k = \frac{22}{7} R^2 H$
$\Rightarrow R^2 = \frac{7k}{18}$ ..... (2)
Put the value of R^2 in eq^{n}(2)
K = $\frac{18 \times 49}{7} = 126$

Sol.238.(c)
Area of hexagon = $6 \times \frac{\sqrt{3}}{4} \times side^2$
$= 6 \times \frac{\sqrt{3}}{4} \times 2\sqrt{3} \times 2\sqrt{3} = 18\sqrt{3} cm^2$

Sol.239.(b)



$\frac{AD}{BD} = \frac{2}{3}$, $area\ of\ BDEC = 63\ cm^2$
$(\frac{2}{5})^2 = \frac{ar(\Delta ADE)}{ar(\Delta ADE + 63)}$
$\Rightarrow ar(\Delta ADE) = 12\ cm^2$

Sol.240.(d)
Area of square field = $\frac{2880}{320} = 9\ hectare$
$9\ hectare = 9 \times 10000 = 90000\ sq\ m$

Sol.241.(a) External radius = 8.5 cm , Internal radius = 7.5 cm
Total surface area of cylinder
= $2\pi h$ (R + r) + $2\pi(R^2 - r^2)$
= $2\pi \times 1000 \times 16 + 2\pi [8.5^2 - 7.5^2]$
= $\frac{44}{7} \times 16(1000 + 1) = 100672\ cm^2$
Total cost of painting the cylinder
= 100672 × 0.15 $\Rightarrow$ ₹ 15100.80

Sol.242.(a)
Area of the floor = $\frac{3675}{12.5} m^2$ = 294 m^2
breadth and length are in the ratio of 2 : 3,
$\Rightarrow 6x^2$ = 294 $\Rightarrow$ x = 7
i.e. length of the floor = 7× 3 m = 21 m

Sol.243.(d) The cylindrical tank has a capacity of 6160 m³.
The diameter of the base of the tank is 28m ⇒ radius = 14 m
So, the volume of the cylinder
$\Rightarrow \pi R^2 h = 6160$
$\Rightarrow \frac{22}{7} \times 14 \times 14 \times h = 6160$
$\Rightarrow h = 10\ m$
So, the depth of the tank (in m) is 10.

Sol.244.(b) If the height of the vertex opposite to the base, from the base is h,
We know for isosceles triangle,
$h^2 = a^2 - \frac{b^2}{4} \Rightarrow h^2$ = (25 - 16) cm
$\Rightarrow h^2$ = 9 cm $\Rightarrow$ h = 3 cm

Sol.245.(d) The room has the dimension of 30m × 15m × 10m.
So, the longest pole that can be placed in the room = $\sqrt{l^2 + b^2 + h^2}$
= $\sqrt{30^2 + 15^2 + 10^2}$ = 35m.

Sol.246.(d) A cuboid having the surface area of 3 adjacent faces as a, b, c (where length = l, breadth = b, height = h)
So. a = lb, b = lh and c = bh
$\Rightarrow$ abc = $(lbh)^2$
Now we know, volume of cuboid = lbh
So, volume = $\sqrt{abc} = (abc)^{\frac{1}{2}}$

Sol.247.(b) The length, breadth and height of the bigger cuboid are 27cm, 18cm and 21cm.
The volume of the bigger cuboid
$= 27 \times 18 \times 21\ cm^3$
The volume of the smaller cube
$= 3 \times 3 \times 3 = 27\ cm^3$,
So, the number of smaller cubes that can be cut from the cuboid
$= \frac{27 \times 18 \times 21}{27} = 378$

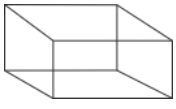
Sol.248.(c) We know, if the length and breadth of a rectangle is increased or decreased by x% and y% then the area of the rectangle changes by,
ΔArea = $\{\pm x\% \pm y\% \pm \frac{xy}{100}\}\%$,
So, here x = 10%, y = 8%
the area will increase by $[10 + 8 + \frac{10\times8}{100}]\%$
= 18.8%

Sol.249.(d) As the man walks around the circular pond exactly once, each step is 44 cm long and he takes 700 steps to go around the pond.
i.e. the circumference of the circular pond = 2Πr = 44×700
$\Rightarrow$ r = 4900 cm = 49 m
So, the area of the pond = Πr^2
$= \frac{22}{7} \times 49 \times 49 \Rightarrow 7546\ m^2$

Sol.250.(c) Length of carpet = $20\frac{5}{2}$m
Length of small piece carpet = $4\frac{1}{2}$m
$\therefore$ Number of pieces
$= \frac{length\ of\ carpet}{length\ of\ small\ piece\ carpet}$
$= \frac{20\frac{5}{2}}{4\frac{1}{2}} = \frac{\frac{45}{2}}{\frac{9}{2}} = \frac{45}{2} \times \frac{2}{9} = 5$

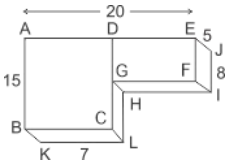
Sol.251.(a)
We know, Area of a circle = πR^2
Given, $\pi R^2 = 154 cm^2$
$= \frac{22}{7} \times R^2 = 154 cm^2$, $R^2 = \frac{154 \times 7}{22}$
$R^2 = 49$, R = 7 cm
Circumference of the circle = 2ΠR
$= 2 \times \frac{22}{7} \times 7 \Rightarrow$ 44cm

Sol.252.(b)



We can see in the above figure that there are 12 straight lines in a cuboid.

Sol.253.(a)



From the above figure, we can get,
DE = GF = (20 - 7) = 13; DG = IJ = 8;
HL = CG = (15 - 8) = 7,
So, the total surface area of the visible faces in the given figure $\rightarrow$
= Area of the rectangles (ABCD + DEFG + BCLK + CGHL + GHIF + EFIJ)
= 105 + 104 + 35 + 35 + 65 + 40 = 384
So, the total surface area of the visible faces in the given figure is $384\ cm^2$.

Sol.254.(c) The dimensions of a room are 2m, 3m and 4m. So, the volume of the room = $2 \times 3 \times 4 = 24\ m^3$
Again, the dimension of one small cuboid $\frac{1}{2}$ m, $\frac{1}{3}$ m and $\frac{1}{4}$ m.
So, the volume of each small cube
$= \frac{1}{2} \times \frac{1}{3} \times \frac{1}{4}\ m^3 = \frac{1}{24}\ m^3$
Then, the number of cubes that can be placed inside the same room
$= 24 \div \frac{1}{24} = 24 \times 24 = 576$

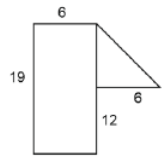
Sol.255.(a)
Volume of cylinder : Volume of the cone
$= \pi R^2 H : \frac{1}{3}\pi R^2 H$
Radius and height are the same,
$1 : \frac{1}{3} \Rightarrow 3 : 1$

Sol.256.(a) $\frac{Volume\ of\ new\ sphere}{Volume\ of\ original\ sphere}$
$= \frac{\frac{4}{3}\pi(2r)^3}{\frac{4}{3}\pi r^3} = \frac{8}{1} = 8 : 1$

Sol.257.(b) As we know radius of the circle R = 21 cm, Area of the sector of a circle having $(\theta = 40°)$
$= \frac{\pi R^2}{360°} \times 40° = \frac{22}{7} \times 21 \times 21 \times \frac{1}{9}$
$= 154\ cm^2$

Sol.258.(c) As we know,
Area of an equilateral triangle = $\frac{\sqrt{3}}{4} \times a^2$
[a = side of equilateral triangle]
$\Rightarrow$ Area $\propto a^2$
So, when the side of an equilateral triangle is made three times the original side, the area of the new equilateral will become = $3^2 = 9$ times.

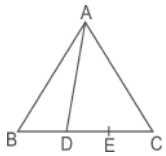
Sol.259.(a)



Area = Area of rectangle + area of triangle
$= (19 \times 6) + (\frac{1}{2} \times 6 \times 7)$
= 114 + 21 = 135 sq . unit

Sol.260.(d) Tiles are square tiles and least no. of tiles is used.
Therefore, length of each square tiles
= HCF of (12 and 16) = 4 meters

Sol.261.(a)



BD = DE = EC and height for triangle ABC and ADC will be the same so the area of the triangle depends on its base.
DC = $\frac{2}{3}$BC
Area of ΔADC = $\frac{2}{3}$ $\times$ area of Δ ABC
$= \frac{2}{3} \times 39 = 26\ cm^2$

Sol.262.(b) The diagonal of square
$\sqrt{2}$ a = $\sqrt{200} \Rightarrow$ a = 10 cm
Area of square = $a^2 = 10^2 = 100\ cm^2$
Now, ratio of sides of rectangle = 5 : 2
Let the length = 5x and breadth = 2x
Area of the rectangle = $5x \times 2x = 10x^2$
$= 100 \Rightarrow x = \sqrt{10}$
$\therefore$ Length of rectangle = $5\sqrt{10} = \sqrt{250}$ cm

Sol.263.(b) when radius = 5 cm
Area of the ballon = $4\pi r^2 = 4\pi \times 25$
When radius = 10 cm
Area = $4\pi \times 100$
Ratio = $\frac{4\pi \times 25}{4\pi \times 100} = \frac{1}{4}$

Sol.264.(d) Volume of metallic cylinder = n $\times$ Volume of one cone
$\Rightarrow \pi R^2 H = n \times \frac{1}{3}\pi r^2 h$
$\Rightarrow 9 \times 5 = n \times \frac{1}{3} \times 0.1 \times 0.1 \times 1$
$\Rightarrow$ n = 9 $\times$ 5$\times$3 $\times$100 $\Rightarrow$ 13,500 cones

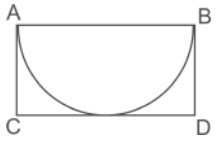
Sol.265.(d)
Volume of cuboid = volume of cube
$\Rightarrow 50 \times 40 \times 32 = (side)^3 \Rightarrow a^3 = 64000$
$\Rightarrow$ a(side) = 40 cm
Surface Area of Cube = $6a^2 = 6 \times 40^2$
= 9600 cm^2

Sol.266.(c) For largest sphere the diameter should be 21 cm
Radius = 10.5 cm
Volume of sphere = $\frac{4}{3} \times \frac{22}{7} \times 10.5 \times 10.5 \times 10.5 = 4{,}851\ cm^3$

Sol.267.(d) Volume of hollow metallic sphere = Volume of solid cylinder
$\Rightarrow \frac{4}{3}\pi(R^3 - r^3) = \pi R^2 h$
$\Rightarrow \frac{4}{3}(5^3 - 3^3) = 7^2 \times h$
$\Rightarrow \frac{4}{3}(125 - 27) = 49 \times h$
$\Rightarrow h = \frac{4 \times 98}{3 \times 49} = \frac{8}{3}$cm

Sol.268.(a)
Side of the rhombus $= \frac{120}{4} = 30$ m
Area = base × height = $30 \times 15 = 450\ m^2$

Sol.269.(a)



The area of the semicircle = 1250 π
$\frac{\pi r^2}{2} = 1250\pi \Rightarrow r^2 = 2500 \Rightarrow r = 50$
Length of the rectangle = 100
Breadth = 50
Area = $50 \times 100 = 5000\ cm^2$

Sol.270.(c) When we cut a solid sphere into 4 pieces, Each piece has 2 semicircular areas due to the cut.
Area increase = πR^2 due to one piece
Total area increased = $4\pi R^2$ = area of solid sphere ,
So, the area becomes 2S if the initial area of Sphere = S.

Sol.271.(a) The cuboid pond is 80m long and 50 m broad. As the average displacement of the water by one person is 0.04 m³ , So the total volume of water in the pond will be = $0.04 \times 500\ m^3$
Then the rise in the water level in the pond = $\frac{0.04 \times 500}{80 \times 50} = \frac{1}{200}\ m = 0.5\ cm$

Sol.272.(a) the length of the resulting cuboid l = 20 cm , breadth b = 10 cm & height h = 10 cm.
then the surface area of the resulting cuboid = $2 \times (lb + lh + bh)$
$= 2 \times (200 + 200 + 100) \Rightarrow 1000\ cm^2$

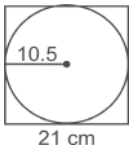
Sol.273.(c) Volume of all three small cubes = Volume of bigger cube
$\Rightarrow 3^3 + 4^3 + 5^3 = a^3 \Rightarrow 27 + 64 + 125 = a^3 \Rightarrow 216 = a^3 \Rightarrow a = 6\ cm$

Sol.274.(b) Volume of water raised = Volume of Cube
$\Rightarrow \pi R^2 h = a^3$
$\Rightarrow 3.142 \times 10 \times 10 \times h = 8^3$
$\Rightarrow h = \frac{512}{3.142 \times 100} = 1.6$ cm

Sol.275.(a) Let side of square = a
= area of square field = $a^2 = 7200\ m^2$
$a = \sqrt{8 \times 9 \times 100} = 60\sqrt{2}$ m
Diagonal of square $= 60\sqrt{2} \times \sqrt{2} = 120$ m
4km/h = $4 \times \frac{5}{18} = \frac{10}{9}$m/s
Time Taken = $\frac{120m}{\frac{10}{9}} = 108$ sec
$= \frac{108}{60}$ min = $\frac{9}{5}$min

Sol.276.(c) Total surface area of Cone
$= \pi(2r) \times \frac{1}{2} + \pi(2r)^2 = \pi r + 4\pi r^2$
$= \pi r(4r + 1)$

Sol.277.(c)



Radius of circle = 10.5, Area of circle = πr^2
$= \frac{22}{7} \times 10.5 \times 10.5 = 346.5\ cm^2$

Sol.278.(d) The area of rectangular floor
$= 30 \times 24 = 720\ m^2$
Area of each carpet = $6 \times 4 = 24\ m^2$
No. of carpets required = $\frac{720}{24} = 30$

Sol.279.(a) Ratio → l : b = 11 : 10
Area of the triangle = 11 × 10 $unit^2$ = 110 m^2
1 unit = 1 m ,So, breadth = 10 unit = 10 m

Sol.280.(c) The outer and inner radii of a circular path are 2a and b,
The area of the path = Area of the outer circle - Area of the inner circle
$= \Pi(4a^2 - b^2)$

Sol.281.(d) The radius of the sphere = 21 cm, So, The volume is
$= \frac{4}{3} \times \pi \times 21^3 = 38808\ cm^3$

Sol.282.(a) The area of a parallelogram with base 44 cm and height 22 cm
= base×height $= 44 \times 22 = 968\ cm^2$

Sol.283.(b) let radius of circular park = R
Area of circular park = πR^2
$\Rightarrow \pi R^2 = 1386 \Rightarrow R^2 = \frac{1386}{\frac{22}{7}} = 441$
$\Rightarrow$ R = 21m
Now required area of the path
$= \pi(R)^2 - \pi(R - 7)^2 = \pi[(21)^2 - (14)^2]$
$= \frac{22}{7} \times 7 \times 35 = 770\ m^2$

Sol.284.(c) The radii of two cylinders are in ratio 2 : 3 their respective heights are in ratio 5 : 3
Volume of Cylinder = $\pi r^2 h$
Ratio of Volume = $(\pi r_1^2 h_1) : (\pi r_2^2 h_2)$
$= 2^2 \times 5 : 3^2 \times 3 \Rightarrow 20 : 27$

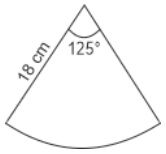
Sol.285.(c) The area of the ring-shaped region enclosed between two concentric circles of radii 14 cm and 7 cm will be
$= \pi \times (R^2 - r^2)$
$= \frac{22}{7} \times (14 + 7) \times (14 - 7) = 462\ cm^2$

Sol.286.(b)
Let the side of equilateral triangle = x
A/Q, Diameter of circle = x
∴ Radius = $\frac{x}{2}$
$$\frac{Area\ of\ circle}{Area\ of\ an\ equilateral\ triangle}$$
$= \frac{\pi(\frac{x}{2})^2}{\frac{\sqrt{3}}{4}x^2} = \frac{\pi x^2}{4} \times \frac{4}{\sqrt{3}x^2} = \frac{\pi}{\sqrt{3}} = \pi : \sqrt{3}$

Sol.287.(b)
Let the actual length of bacteria = x cm
A/Q, 60000x = 6 ⇒ x = $\frac{1}{10000}\ cm$

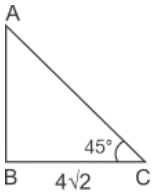
Sol.288.(a) The ratio of volumes of two cubes = 64 : 1331
Ratio of sides = $\sqrt[3]{64} : \sqrt[3]{1331} = 4 : 11$
∴ Ratio of total surface area of the cubes
$= 4^2 : 11^2 = 16 : 121$

Sol.289.(d)



Perimeter of Sector = $\frac{125}{360} \times 2\pi R + 2R$
Perimeter of Sector
$= \frac{125}{360} \times 2 \times \frac{22}{7} \times 18 + 2 \times 18$
= 39.3 + 36 = 75.3 cm

Sol.290.(d)



Cos 45° = $\frac{4\sqrt{2}}{AC}$

$\Rightarrow \frac{1}{\sqrt{2}} = \frac{4\sqrt{2}}{AC} \Rightarrow$ AC = 8 m

Sol.291.(d) Ratio of both cone curved surface areas = $\pi r \times 3 : \pi r \times 4 = 3 : 4$

Sol.292.(d) D = 7 cm, r = 3.5 or $\frac{7}{2}$

Total surface area of hemisphere = $3\pi r^2$

$= 3 \times \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} = 115.50 cm^2$

Sol.293.(c)

As Area of 1 km^2 = $0.0025 cm^2$

So 8000 km^2 = 0.0025 ×8000 = $20 cm^2$

Sol.294.(b)

Area of square = 10 × area of rectangle

$a^2 = 10 \times 5 \times 8 \Rightarrow a = 20$

Perimeter of the square

= 4 × a = 4× 20 = 80 cm

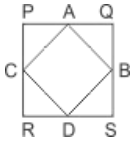
Sol.295.(c)

Area of equilateral triangle = $\frac{\sqrt{3}}{4}a^2$

$= \frac{\sqrt{3}}{4} \times 10 \times 10 = 25\sqrt{3} = 43.25\ m^2$

Sol.296.(d) HCF of (48, 56, 72) = 8 m

Sol.297.(a)



Area of square = a^2= 36

a = 6 and $\frac{a}{2} = 3$

In Δ AQB (Right angle triangle)

AQ = BQ = 3

Area of the Δ AQB = $\frac{1}{2} \times 3 \times 3$

So that area of square ABCD = Area of square PQRS - 4 × Area of the Δ AQB

Area of square ABCD = 36 -18 = 18 cm^2

Sol.298.(d) Given that,

Side of a tile = 50 cm

→ Area of a tile = 2500 cm^2

Area of the room = 784 × 2500 cm^2

$(side\ of\ the\ room)^2$ = 784 × 2500 cm^2

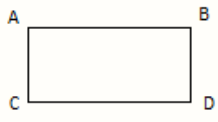
Side of the room = 1400 cm or 14 m

Sol.299.(a) Fencing in rectangle means perimeter = $\frac{1920}{24}$ = 80 m

$\Rightarrow$ 2(l + b) = 80 (where, l→ 23)

$\Rightarrow$ 2(23 + b) = 80 $\Rightarrow$ b =17 m

Sol.300.(b)



Ratio of the length to the breadth = 6 : 5

Let length = 6x and breadth = 5x

A/Q , 6x– 5x = 25 m $\Rightarrow$ x = 25 m

Length = 6×25 = 150 m , breadth

$= 5 \times 25$ = 125 m

perimeter of the field = 2 (l + b) = 550 m

Sol.301.(d) Area of the equilateral triangle : Area of square

= $x^2 \times \frac{\sqrt{3}}{4} : x^2 \Rightarrow \sqrt{3} : 4$

Sol.302.(c) If the length of one side is 30 ft and the area is 690 ft^2

$\Rightarrow$ Length of another side = 23ft

Now, length of fencing required for the three sides = 23 + 23 + 30 = 76 ft

Sol.303.(a) Let length and breadth be 7x and 6x respectively.

ATQ, 7x - 6x = 35 $\Rightarrow$ x = 35

Perimeter = 2(7x + 6x) = 26x

$= 26 \times 35 = 910\ m$

Sol.304.(d)

Area of square plot = 11025 m^2

$\Rightarrow a^2 = 11025 \Rightarrow a = 105\ m$

Perimeter of square land

$= 4 \times 105 = 420\ m$

Cost of fencing = $420 \times 85 = Rs\ 35,700$

Sol.305.(c) Area of square = 22

$\Rightarrow a^2 = 22 \Rightarrow a = \sqrt{22}\ cm$

Perimeter of square = $4\sqrt{22}\ cm$

Circumference of circle = perimeter of square

$\Rightarrow 2 \times \frac{22}{7} \times r = 4\sqrt{22}$

$\Rightarrow r = \frac{4\sqrt{22} \times 7}{44} = \frac{7}{11}\sqrt{22}\ cm$

Area of circle = πr^2

$= \frac{22}{7} \times \frac{7}{11} \times \frac{7}{11} \times 22 = 28\ cm^2$

Sol.306.(a)

Area of bigger sheet of paper

$= 72 \times 48 = 3,456$

Area of envelope = $18 \times 12 = 216$

Number of envelope = $\frac{3456}{216} = 16$

Sol.307.(a) Area of the trapezium

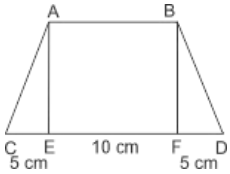
$= \frac{1}{2}(sum\ of\ parallel\ sides) \times$

$(distance\ between\ both\ parallel\ sides)$

$\Rightarrow \frac{1}{2}(30 + 24) \times d = 540$

$\Rightarrow 27d = 540 \Rightarrow d = 20\ m$

Sol.308.(b)



Given, parallel sides are 10cm and 20 cm

And non - parallel sides are equal to 10 cm.

CE = 5 cm

Then , AE = $\sqrt{10 \times 10 - 5 \times 5} = 5\sqrt{3}$

Area of the trapezium

= $\frac{1}{2}$ × (sum of the parallel side) × height

Area of the trapezium = $\frac{1}{2} \times (30) \times 5\sqrt{3}$

$= 75\sqrt{3}\ cm^2$

Sol.309.(a) Given ,

r = 80 cm and h = 77 cm

Curved surface area of roller = 2πrh

$= 2 \times \frac{22}{7} \times 0.77 \times 0.8 = 3.872$

The roller covers an area of 96.8 m^2 .

Number of revolution

$= \frac{total\ area}{curved\ surface\ area} = \frac{96.8}{3.872} = 25$

Number of revolution = 25

Sol.310.(a) Total surface area of a cube

$= 6a^2 \Rightarrow 6a^2 = 864 \Rightarrow a^2 = 144 \Rightarrow$ a = 12

Volume of the cube = $a^3 = 12^3 = 1728\ m^3$

Sol.311.(b) ratio of the volume of the cone to the volume of the cylinder

$\rightarrow \frac{1}{3}\pi r^2 h : \pi r^2 h = 1 : 3$

Sol.312.(b)

Let the number of cubes formed = x

Volume of Cuboid= x × volume of cube

$\Rightarrow 9 \times 6 \times 6 = x \times 3^3$

$\Rightarrow x = \frac{9 \times 6 \times 6}{27} = 12$

Sol.313.(d) Radius = 28 cm = 0.28 m

Area of one cylindrical pillar = $2\pi RH$

$= 2 \times \frac{22}{7} \times 0.28 \times 4 = 7.04\ m^2$

Area of 24 such pillars

$= 24 \times 7.04 = 168.96 m^2$

Cost of painting

$= 168.96 \times 8 = Rs\ 1351.68$

Sol.314.(c) When we join 3 cubes, then l = 48 cm, b = 16 cm and h = 16 cm

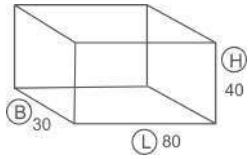
Area of cuboid formed
= 2(16×16 + 16 × 48 + 16 × 48)
= 3584 cm^2

Sol.315.(a) Let initial radius and height = 1 and 1 unit respectively
Initial volume = $\pi \times 1^2 \times 1 = \pi$
Final volume = $\pi \times 2^2 \times 2 = 8\pi$
Increment in volume = 7π
percentage increase in volume
$= \frac{7\pi}{\pi} \times 100 = 700\%$

Sol.316.(d) Area of the four walls along with the ceiling of the room = (area of the ceiling) + (area of the four walls)
= (12 × 8) + { 2 (8 × 4) + 2(12 × 4) }
= 256 m^2
Total cost of white washing = 5 × 256
= 1280 Rs

Sol.317.(d)
volume of a sphere = 4851cm^3
$\Rightarrow \frac{4}{3}\pi R^3 = 4851$
$\Rightarrow \frac{4}{3} \times \frac{22}{7} \times R^3 = 4851$
$\Rightarrow R^3 = \frac{4851 \times 7 \times 3}{4 \times 22}$
$= \frac{441 \times 21}{8} = \frac{9261}{8}$
$\Rightarrow R = \frac{21}{2} \Rightarrow D = 21\ cm$

Sol.318.(b)

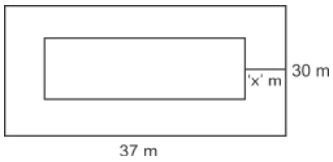


Area of base = L × B = $80 \times 30 = 2400$
Area of side faces = 2 × (B × H)
= $2 \times 30 \times 40 = 2400$
Area of back face = L × H
= $80 \times 40 = 3200$
Total area = 2400 + 2400 + 3200
= 8000 cm^2

Sol.319.(c) Volume of wall
= $4000 \times 80 \times 600 = 192000000\ cm^3$
Volume of one brick
= $25 \times 5 \times 20 = 2500\ cm^3$
Number of bricks = $\frac{192000000}{2500}$ = 76800

Sol.320.(c)
Ratio of area of two spheres = 1 : 4
Ratio of radius = $\sqrt{1} : \sqrt{4}$ = 1: 2
Ratio of volume = $1^3 : 2^3 = 1 : 8$

Sol.321.(c)



Area of path = Area of bigger rectangle - Area of smaller rectangle
$\Rightarrow 570 = 37 \times 30 - (37 - 2x)(30 - 2x)$
$\Rightarrow 570 = 1110 - (1110 - 134x + 4x^2)$
$\Rightarrow 570 = 134x - 4x^2$
$\Rightarrow 4x^2 - 134x + 570 = 0$
$\Rightarrow 4x^2 - 20x - 114x - 570 = 0$
$\Rightarrow 4x(x - 5) - 114(x - 5) = 0$
$\Rightarrow (x - 5)(4x - 114) = 0$
$x = 5\ or\ x = \frac{114}{4}$

Sol.322.(c) Let the length , breadth and height of the cuboid = 3x, 2x, and 2x respectively
Volume of the cuboid = Volume of the cube
$\Rightarrow 3x \times 2x \times 2x = 324 \Rightarrow 12x^3 = 324$
$\Rightarrow x^3 = \frac{324}{12} = 27 \Rightarrow x = 3\ cm$
Length = 3x = 3 × 3 = 9 cm

Sol.323.(b) Sum of interior angle + Sum of exterior angle = 180°
4 + 1 = 5 unit = 180°
Interior angle = 4 unit = $\frac{180}{5} \times 4 = 144°$
Let no. of sides = n
Sum of interior angles = 180°(n - 2)
$\Rightarrow n \times 144° = 180°(n - 2)$
$\Rightarrow 144°\ n = 180° \times n - 360°$
$\Rightarrow 36° \times n = 360° \Rightarrow n = 10$

Sol.324.(a)
Ratio of the heights of two cones is 1 : 4
Ratio of diameter = 4 : 5
Ratio of radius = 4 : 5
Ratio of volumes = $4^2 \times 1 : 5^2 \times 4$
= 4 : 25

Sol.325.(c)
L = 20 m , B = 25 m and H = 35 m
Total surface area of the Room
= 2(L + B)H = 2(45) × 35 = 3150 m^2

Sol.326.(b)
The ratio of the curved surface area to the total surface area is 5:9
$\frac{2\pi rh}{2\pi r(h + r)} = \frac{5}{9} \Rightarrow \frac{h}{(h + r)} = \frac{5}{9}$
now $\frac{h}{r} = \frac{5}{4}$ = 5 : 4

Sol.327.(b)
Area of the floor = $12 \times 8 = 96\ m^2$
Side of square = HCF of 12 and 8 = 4 m
Area of square = $4^2 = 16\ m^2$
No. of square design required = $\frac{96}{16} = 6$

Sol.328.(a) Sum of all interior angles of a polygon = (n - 2) × 180°
Sum of all exterior angles of a polygon = 360°
ATQ, (n - 2) × 180° = 3 × 360° ⇒ n = 8

Sol.329.(b)
Given , length of the rectangle = 15 cm , area of the rectangle = 150 cm^2
Then, breadth = 10cm
ATQ, Area increased by = 3 : 4 ,
3 unit = 150 cm^2 ⇒ 4 unit = 200 cm^2
Hence, new length = 20 cm and breadth = 10 cm
New Perimeter of rectangle
= 2 (L + B) =2 × (20 + 10) = 60 cm

Sol.330.(b) Ratio between length and breath = 13x : 11x
Area of the rectangle = 1287 cm^2
= 13x × 11x
⇒ 143 x^2 = 1287 ⇒ x = 3
Now , L = 39 and B = 33
Perimeter of rectangle = 2(L + B)
= 2(39 + 33) = 144 cm

Sol.331.(a) Number of pieces of exact 17 cm length can be cut from a 960 cm long rod = $\frac{960}{17}$ = 56 approx

Sol.332.(d) Height and radius of the cylinder and cone are the same.
Ratio of volumes = $\pi R^2 H : \frac{1}{3}\pi R^2 H$ = 3 :1

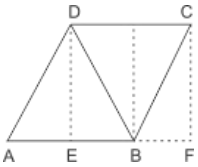
Sol.333.(c) Volume of ice compartment of refrigerator = 8 × 5 × 4 = 160
Volume of each ice cubes is 2 cm on its edge = 2 × 2 × 2 = 8
Possibility to contain 2 cm ice cubes in refrigerator ice compartment
= $\frac{160}{8}$ = 20

Sol.334.(a)
Area of the square = 81 $cm^2 = a^2$
Now , a = 9 then we can say that
Perimeter of semicircle = Perimeter of square
πr + 2r = 4 a ⇒ r (π + 2) = 4 × 9
⇒ r = $36 \times \frac{7}{36}$ = 7 cm
area of the semicircle = $\frac{1}{2}\pi r^2$
= $\frac{1}{2} \times \frac{22}{7} \times 7 \times 7 = 77\ cm^2$

Sol.335.(d)
Perimeter of square = 4a = 44 ⇒ a = 11
Area of square = a^2 = 11 × 11 = 121 cm^2

Perimeter of circle = 2 π r = 44 ⇒ r = 7
Area of circle = πr^2 = 154 cm^2
Difference between area of circle and square = 154 - 121 = 33 cm^2

Sol.336.(c) If a triangle and a parallelogram are on the same base and between the same parallels, then the area of the triangle is equal to half the area of the parallelogram.



area of ΔABD = $\frac{1}{2}$area of parallelogram ABCD = $\frac{1}{2}$(AB × AE), [Since, DE is the altitude of parallelogram ABCD],Here, AB is the base and AE is the height of ΔABD

Sol.337.(c) Square 1, perimeter= 24cm, Side= 6cm, Area= 6 x 6 = 36cm^2 ,
Square 2, perimeter = 32cm, side = 8cm, Area = 64cm^2,
Square 3, Perimeter = 40cm, side = 10cm, Area =100cm^2,
Square 4, Perimeter = 76cm, side= 19cm, Area= 361cm^2,
Square 5, Perimeter = 80cm, Side =20cm, Area = 400cm^2
Sum of the areas
= 36 + 64 + 100 + 361 + 400 = 961cm^2
So side of the big Square= $\sqrt{961}$ = 31cm
Perimeter of the square= 31 x 4 = 124cm.

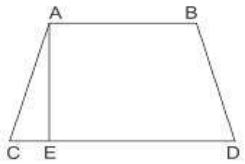
Sol.338.(a) We know that ,
60 min = 2π r= circumference of the clock (circle)
So , 60 min = 2π r ----- (i)
40 min = ? ------ (ii)
Appling cross multiplying in above equations
$40 \times \frac{2 \times 22 \times 1.5}{7}$ = 60 × ? ⇒ ?
= 6.28 cm

Sol.339.(d) Required Number
$= \frac{Area\ of\ bigger\ Square}{Area\ of\ Smaller\ Square}$
$= \frac{4 \times 4}{0.1 \times 0.1}$ = 1600

Sol.340.(c) Let length of the plot = 3x
Breadth = x
2(3x + x) = 240 ⇒ 8x = 240 ⇒ x = 30
Length of the plot = $3 \times 30 = 90\ m$

Sol.341.(d) Diagonal of the square = Diameter of the circle
$\Rightarrow \sqrt{2}a = 8 \Rightarrow a = 4\sqrt{2}$
Area of the square = $(4\sqrt{2})^2 = 32\ cm^2$

Sol.342.(c)



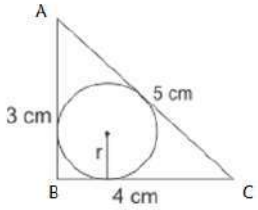
Given -- AB = 18 cm , CD = 30 cm and AE = 24 cm
Area of trapezium
= $\frac{1}{2}$ × (sum of parallel side) × height
= $\frac{1}{2}$ × 48 × 24 = 576 cm^2
A/Q ,
area of trapezium = area of square
⇒ 576 = a^2 ⇒ a = 24
Now , perimeter of square
= 4a = 4 × 24 = 96 cm

Sol.343.(c) Area of the container
= 9.37 m^2= 93750 cm^2
Total surface area of 1 brick = $2 \times (22.5 \times 10 + 10 \times 7.5 + 7.5 \times 22.5)$
= 937.5 cm^2
No. of bricks = $\frac{93750}{937.5}$ = 100

Sol.344.(a)
Let area of the smallest triangle = X cm^2
When triangle are similar ,
Ratio of area = $Ratio\ of\ (altitude)^2$
A/Q , $\frac{4^2}{6^2} = \frac{X}{36}$
16 × 36 = 36 × X ⇒ X = 16 cm^2

Sol.345.(c)
Sides of rectangle are 100 and 80
Area of the rectangle = 100 × 80
= 8000 m^2
Sides of rectangle except path 100 - 20 = 80 and 80 - 20 =60
Area of rectangle except path area
= 80 × 60 = 4800
Area of path = 8000 - 4800 = 3200

Sol.346.(a)



Area = $\frac{1}{2} \times 4 \times 3 = 6cm^2$
S = $\frac{3+4+5}{2} = 6cm$
Radius = r = $\frac{area\ of\ \Delta}{semi - perimeter}$
Radius = r = $\frac{6}{6} = 1\ cm$
Alternate solution:
Inradius = $\frac{a+b-c}{2}$ = $\frac{3+4-5}{2}$ = 1 cm

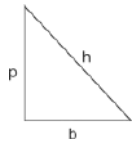
Sol.347.(a) Area of the given trapezium
= $\frac{1}{2}(4 + 6) \times 5 = 25\ sq.\ unit$
Cost of painting = $25 \times 50 = Rs\ 1250$

Sol.348.(c)
Total Surface area of cone = $\pi rl + \pi r^2$
where l = 4l and r = $\frac{r}{4}$
= $\pi r \times 4l + \pi \times \frac{r}{4} \times \frac{r}{4}$
= $\pi r(4l + \frac{r}{16})$

Sol.349.(a) Volume of large cube = Sum of volume of all three smaller cubes
$a^3 = 3^3 + 4^3 + 5^3 = 27 + 64 + 125 = 216$
$\Rightarrow a = 6$
Area of all small cubes together
= $6(3^2 + 4^2 + 5^2) = 300$
Area of large cube = $6 \times 6^2 = 216$
Ratio = 300 : 216 = 25 : 18

Sol.350.(a)
Area of walls = perimeter x height
Area of all 4 walls = 18 x 3 = 54 m^2

Sol.351.(a)



Perimeter of right triangle = 56 cm
And Area = $\frac{1}{2}bp = 84$
$\Rightarrow bp = 168 = 7 \times 24$
b = 7 and p = 24
h = $\sqrt{7^2 + 24^2} = \sqrt{625} = 25\ cm$
Alternate Method :
As we know this is a right angle triangle so we have to try basic triplets and satisfy the conditions of the question. (7,24,25) will satisfy the conditions of questions so 25 will be the hypotenuse.

Sol.352.(d) Area of incircle = 462 cm^2
$\Rightarrow \pi \times \frac{a^2}{12} = 462$
$\Rightarrow \frac{22}{7} \times \frac{a^2}{12} = 462$
$\Rightarrow a^2 = 1764 \Rightarrow a = 42$
Perimeter of the equilateral triangle
= $3a = 3 \times 42 = 126\ cm$

Sol.353.(d) Area of circle = πr^2
Circumference of circle = 2πr
A : C = r : 2 ⇒ A : C^2 = 1 : 4π

Sol.354.(a) Diameter of circle = 49 cm
Circle is converted to a rectangle , so that both perimeter are the same.
Perimeter of circle
= perimeter of rectangle
2πr = 2(l + b)
$2 \times \frac{22}{7} \times \frac{49}{2}$ = 2(7x + 4x)
77 = 11x ⇒ x = 7
So that, the side of the rectangle
= 49 cm and 28 cm
Area of the rectangle = 49 × 28
= 1372 sq cm

Sol.355.(a) According to the question,
$2\Pi r \times 1000 = 154 \times 1000$
$\Rightarrow 2 \times \frac{22}{7} \times r = 154$
$\Rightarrow r = \frac{14 \times 7}{4} = \frac{49}{2} = 24\frac{1}{2} m$

Sol.356.(c)
Let the base of the parallelogram = 'x' m
Altitude = 2x
Area = base × $height = 288$
$\Rightarrow x \times 2x = 288$
$\Rightarrow x^2 = 144 \Rightarrow x = 12\ m$
Altitude = $2 \times 12 = 24\ m$

Sol.357.(a)
Let the equal sides of triangle = x
$\sqrt{x^2 + x^2} = 8$
$\Rightarrow \sqrt{2}x = 8 \Rightarrow x = 4\sqrt{2}$ cm
Area of triangle = $\frac{1}{2} \times 4\sqrt{2} \times 4\sqrt{2} = 16\ cm^2$

Sol.358.(b)
Given ,a × $b = 60$, & 2(a + b) = 34
or , a + b = 17.....(1)
squaring equation 1,
289 = $a^2 + b^2 + 2ab$
= $a^2 + b^2$ = 289 - 120 = 169.
Now diagonal $\sqrt{a^2 + b^2}$ = 13

Sol.359.(d) Total surface area of a cube
= $6a^2 = 6 \times 2^2$ = 24 m²

Sol.360.(c) Ratio of lengths = 3 : 5
Ratio of Areas = $3^2 : 5^2$ = 9 : 25

Sol.361.(d) 35% = $\frac{7}{20}$
If initial Radius = 20, final radius
= 20 - 7 = 13
Ratio of radius = 20 : 13
Ratio of Areas = $20^2 : 13^2$ = 400 : 169
Decrease in area = 400 - 169 = 231
% decrease in area = $\frac{231}{400} \times 100 = 57\frac{3}{4}\%$

Sol.362.(d) Let the length and breadth of the rectangle = 2x and x
Perimeter = 2 (2x + x) = 6x
Area = $2x \times x = 2x^2$
A/Q,
$\Rightarrow \frac{6x}{2x^2} = \frac{3}{4} \Rightarrow 3x = 12 \Rightarrow x = 4$
Length = 2x = $2 \times 4 \Rightarrow 8\ units$

Sol.363.(b)
Let the breadth of rectangle = x
Length of rectangle = x + 2
A/Q,
2(x + 2 + x) = 20 ⇒ $4x + 4 = 20$
$\Rightarrow 4x = 16 \Rightarrow x = 4$
Length of rectangle = x + 2 = 4 + 2 = 6 cm
Breadth of rectangle = x = 4 cm
Area of rectangle = $6 \times 4 = 24\ cm^2$

Sol.364.(b) Perimeter = 64 cm
Semi perimeter (s) = 32 cm
Area of the triangle = s × r
= $32 \times 8 = 256\ cm^2$

Sol.365.(b) Volume of the spherical solid = 38808 cm³
$\Rightarrow \frac{4}{3}\pi R^3 = 38808$
$\Rightarrow \frac{4}{3} \times \frac{22}{7} \times R^3 = 38808$
$\Rightarrow R^3 = \frac{38808 \times 3 \times 7}{88} = 9261$
$\Rightarrow R = 21\ cm$

Sol.366.(a)

Original		New
2	:	3
2	:	3
4	:	9

The percentage increase in its area
= $\frac{5}{4} \times 100 = 125\%$

Sol.367.(d) Ratio of sides = 4 : 5 : 6 : 7
Perimeter = 4 + 5 + 6 + 7 = 22
22 unit = 176 cm
Longest side = 7 unit = $\frac{176}{22} \times 7 = 56$ cm

Sol.368.(a)
Radius = 7 cm and slant Height = 25 cm
curved surface area of a cone = πrl
= $\frac{22}{7} \times 7 \times 25 = 550\ cm^2$

Sol.369.(d) Given , SR = 8 cm , PR = 15 cm , PQ = 9 cm
In triangle PQR
By the help of triplet , (12 , 9 , 15)
So height of the trapezium = 12 cm
So , area = $\frac{1}{2}$(8 + 9) × 12
Area = $102 cm^2$

Sol.370.(c)
volume of the hemisphere = $\frac{2}{3}\pi r^3$
$\frac{2}{3}\pi r^3 = 19404 \Rightarrow \pi r^3 = 19404 \times \frac{3}{2}$
$r^3 = 19404 \times \frac{3}{2} \times \frac{7}{22}$
r^3 = 9261 ⇒ r = 21 cm

Sol.371.(c) Let , length of each side = a
A/Q , length of each side = 2a
Volume of the cube = $a^3 = (2a)^3 = 8\ a^3$
So , we can say that the final volume is 8 times the original volume.

Sol.372.(c)
Length of kitchen = 2.4 m = 240 cm
Breadth of kitchen = 1.6 m = 160 cm
Area of the kitchen = 240 × 160 = $38400 cm^2$
Side of square tile = 10 cm
Area of the tile = $10^2 = 100\ cm^2$
No. of tiles = $\frac{38400}{100}$ = 384

Sol.373.(d) The radius and height of a cylinder are 28 cm and 40 cm, respectively.
Then the volume is
= $\frac{22}{7} \times 28 \times 28 \times 40 = 98560$cm³

Sol.374.(d)
Surface area of a sphere = $4\Pi R^2$
$= 4 \times \frac{22}{7} \times 21 \times 21 \Rightarrow 5544\ m^2$

Sol.375.(d) The ratio of the areas of two squares is 169 : 196
The ratio between their sides ($a_1 : a_2$)
= $\sqrt{169} : \sqrt{196}$
The ratio of their perimeters ($4a_1 : 4a_2$)
= 13 : 14

Sol.376.(b) Length of rectangle = 4x
Breadth of rectangle = x
Edge of the square = 8 cm A/Q,
Area of rectangle = Area of square
$\Rightarrow 4x \times x = 8^2 \Rightarrow x^2 = 16 \Rightarrow x = 4$
Perimeter of the rectangle = 2(4x + x)
= 10x ⇒ $10 \times 4 \Rightarrow 40\ cm$

Sol.377.(d) The ratio of curved surface area to total surface area is 3 : 7
$\frac{2\pi rh}{2\pi r(h + r)} = \frac{3}{7} = \frac{h}{(h + r)} = \frac{3}{7}$
7h = 3h + 3r ⇒ 4h = 3r ⇒ $\frac{h}{r} = \frac{3}{4}$ = 3 : 4

Sol.378.(c) The total number of smaller cubes = $\frac{volume\ of\ the\ greatest\ cube}{volume\ of\ the\ smaller\ cube}$
= $\frac{8 \times 8 \times 8}{2 \times 2 \times 2}$ = 64

Sol.379.(c) The diameter of the sphere = side of the solid cube = 6 cm
Radius of the sphere = 3 cm

Volume of the sphere = $\frac{4}{3}\pi R^3$

= $\frac{4}{3}\times\ \pi \times 3 \times 3 \times 3$ = 36 π cm^3

Sol.380.(c)

Slant height $(L^2) = H^2 + (R - r)^2$

$\Rightarrow L^2 = 8^2 + (9 - 3)^2 \Rightarrow L^2$ = 64+36

$\Rightarrow L^2$ = 100 $\Rightarrow L = 10\ cm$

Sol.381.(d) Volume of the hemispherical

= $\frac{2\pi R^3}{3}$ = $\frac{2}{3}$ × π × 12 × 12 × 12

Volume of the cylindrical bottles = $\pi r^2 h$

$= \pi \times 3 \times 3 \times 4$

Let no.of bottles required be N

Now , $\frac{2}{3}$ × π × 12 × 12 × 12

= N × π × 3 × 3 × 4

on solving we get N = 32

Sol.382.(a) Let side of the square = a

Inradius = $\frac{a}{2}$

Circumradius = half of diagonal

= $\frac{\sqrt{2}a}{2} = \frac{a}{\sqrt{2}}$

Ratio of area = $\frac{a^2}{4} : \frac{a^2}{2} = 1 : 2$

Sol.383.(b) $(d_1)^2 + (d_2)^2 = 4a^2$

$(24)^2 + (d_2)^2 = 4 \times 169$

$d_2 = 10$

Area of rhombus= $\frac{1}{2}$ $d_1 \times d_2$

= $\frac{1}{2}$ × 24 × 10 =120 cm^2

Sol.384.(c) Given ,length of the rectangle

= 30 cm and width = 30 × $\frac{2}{3}$ = 20 cm

Perimeter of the rectangle = perimeter of the square

2 (l + b) = 4 a

2 (30 + 20) = 4 a

100 = 4 a ⇒ a = 25 cm

Now , area of the square = $a^2 = 25^2$

= 625 cm^2

Sol.385.(b) internal and external radius of the Hollow sphere is 2 cm and 4 cm.

radius of the cone = 4 cm

⇒Volume of the Hollow sphere = volume of cone

$\Rightarrow \frac{4}{3} \times \pi \times (R^3 - r^3) = \frac{1}{3}\pi r^2 h$

$\Rightarrow \frac{4}{3} \times \pi \times (4^3 - 2^3) = \frac{1}{3}\pi \times 4^2 \times h$

⇒ 4 × 56 = 4 × 4 × h ⇒ h = 14 cm

Hence , height of the cone = 14 cm

Sol.386.(c) L = 8 m, b = 4 m and h = 1 m 22 cm = 1.22m

Total surface area = 2(lb + bh + lh) - lb

= 2 (8 × 4 + 4 × 1.22 + 8 × 1.22) - 8 × 4 = 2 (32 + 4.88 + 9.76) - 32

= 2 × 46.64 - 32 = 93 .28 - 32 = 61.28 m^2

Sol.387.(b) The diagonal of a cube = a$\sqrt{2}$

so, a$\sqrt{2}$ = 6$\sqrt{2}$ ⇒ a = 6$\frac{\sqrt{3}}{\sqrt{2}}$

Now , surface area of the cube = $6a^2$

= 6 × $(6\frac{\sqrt{3}}{\sqrt{2}})^2$ = 144 cm^2

Sol.388.(a) Given , height = 14 cm , curved surface area of cylinder = 660cm^2

2πrh = 660

2 × $\frac{22}{7}$ × r × 14 = 660 ⇒ r = $\frac{15}{2}$

Volume of the cylinder = $\pi r^2 h$

= $\frac{22}{7} \times \frac{15}{2} \times \frac{15}{2} \times 14$ = 2475 cm^3

Sol.389.(d)

Their lengths are in the ratio 7 : 5

Area of the polygon would be in the ratio

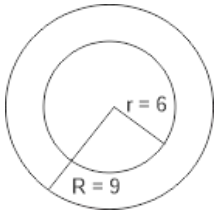
= 49 : 25

A/Q, 49 unit = 1127 cm^2

25 unit = $\frac{1127}{49}$ × 25 = 575 cm^2

Sol.390.(c)

Radius of bigger circle = 6 + 3 = 9



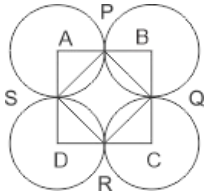
Area of smaller circle = π × $6^2 = 36\pi$

Area of bigger circle = π × $9^2 = 81\pi$

Area of annulus formed between two circles = (81 - 36)π = 45π

= 45 × $\frac{22}{7} = \frac{990}{7}$ cm^2

Sol.391.(d)



Area of the square formed by the centres

= 2r × $2r = 4r^2$

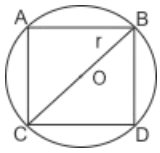
Diagonals of the rhombus = PR = SQ = 2r

Area of the rhombus

= $\frac{1}{2} \times d_1 \times d_2 = \frac{1}{2} \times 2r \times 2r = 2r^2$

Required ratio = $4r^2 : 2r^2$ = 2 : 1

Sol.392.(c)



Let ABCD is the square in the circle

So that , OA = OB = OC = OD

BC = 8 + 8 = 16

In △ABC

$BC^2 = AB^2 + AC^2 \Rightarrow 16^2 = 2\ AB^2$

$\Rightarrow AB^2$ = 128 ⇒ AB = 8$\sqrt{2}$ cm

Sol.393.(b) Let , a = 5 cm , b = 7 cm and c = 11 cm

S = $\frac{5 + 7 + 11}{2} = \frac{23}{2}$

Area of the triangle

= $\sqrt{s\ (s - a)\ (s - b)\ (s - c)}$

Area of the triangle =

$\sqrt{\frac{23}{2}\ (\frac{23}{2} - 5\ )\ (\frac{23}{2} - 7\ )\ (\frac{23}{2} - 11)}$

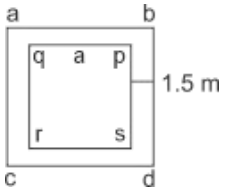
Area of the triangle =

$\sqrt{\frac{23}{2} \times \frac{13}{2} \times \frac{9}{2} \times \frac{1}{2}}$

Area of the triangle = $\sqrt{\frac{2691}{16}}$

= 12.97 cm^2

Sol.394.(c)



Area of the road = area of square abcd - area of square pqrs

Area of the road = $(a + 3)^2 - a^2$

225 = a^2 + 9 + 6a - a^2 ⇒ 6 a = 216

⇒ a = 36m

Side of the park = 36 m

Hence , perimeter of the park

= 4 × 36 = 144 m

Sol.395.(a)

Perimeter and area are numerically equal,

$4a = a^2 \Rightarrow a = 4\ unit$

Sol.396.(b)

Area of the floor = 4.5 × 1.5 = 6.75

HCF of 4.5 and 1.5 = 1.5

Area of square slab = 1.5 × 1.5 = 2.25

Number of slabs = $\frac{6.75}{2.25}$ = 3

Sol.397.(c) Other two sides except hypotenuse will be equal

Let other sides = x

A/Q ,

$\Rightarrow x^2 + x^2 = (28\sqrt{2})^2 \Rightarrow 2x^2 = 1568$

$\Rightarrow x^2 = 784 \Rightarrow x = 28\ cm$

Area of the right isosceles triangle

$= \frac{1}{2} \times 28 \times 28 = 392\ cm^2$

Sol.398.(a) Volume of two shapes(sphere + cone)= $\frac{7}{3}\pi r^3$

$\Rightarrow \frac{4}{3}\pi r^3 + \frac{1}{3}\pi r^2 h = \frac{7}{3}\pi r^3$

$\Rightarrow \frac{1}{3}\pi r^2(4r + h) = \frac{7}{3}\pi r^3$

$\Rightarrow 4r + h = 7r \Rightarrow h = 3r \Rightarrow \frac{h}{r} = 3$

Sol.399.(b) A/Q,
Circumference - radius = 37 cm
$\Rightarrow 2\pi R - R = 37 \Rightarrow R(2\pi - 1) = 37$
$\Rightarrow R\ (2 \times \frac{22}{7} - 1) = 37$
$\Rightarrow R\ (\frac{37}{7}) = 37 \Rightarrow R = 7$ cm
Area of the circle
$= \frac{22}{7} \times 7 \times 7 = 154\ cm^2$

Sol.400.(d)
Altitude of equilateral triangle
$= \frac{\sqrt{3}}{2}a = 12\sqrt{5} \Rightarrow a = \frac{24\sqrt{5}}{\sqrt{3}}$
Difference of areas of the circumscribed circle and the inscribed circle is
$= \pi a^2(\frac{1}{3} - \frac{1}{12})$
$= \pi \times \frac{576 \times 5}{3} \times \frac{1}{4} = 240\ \pi\ cm^2$

Sol.401.(a) Let , angle are 1x , 2x , 3x
We know that , sum of the angles = 180°
1x + 2x + 3x = 180° ⇒ 6x = 180°⇒ X = 30°
Then , Difference between the greatest and the smallest angle = 2x = 60°

Sol.402.(c) Radius = 8 cm
Volume of the big ball = $\frac{4}{3}\pi r^3$
$= \frac{4}{3}\pi \times 8^3 = \frac{4}{3}\pi \times 512$
And small ball , radius = 0.5 cm
Volume of the 1 small ball = $\frac{4}{3}\pi r^3$
$= \frac{4}{3}\pi \times 0.5^3$
Possible balls = $\frac{\frac{4}{3}\pi \times 512}{\frac{4}{3}\pi \times 0.5^3}$ = 4096

Sol.403.(b) Area of square = 2 km^2
$a^2 = 2 \Rightarrow$ a = $\sqrt{2}$
Diagonal of the square = $a\sqrt{2} = \sqrt{2} \times \sqrt{2} = 2$

Sol.404.(c) Volume of all smaller cubes = volume of bigger cube
$\Rightarrow 3^3 + 4^3 + 5^3 = a^3$
$\Rightarrow 27 + 64 + 125 = a^3$
$\Rightarrow 216 = a^3 \Rightarrow a = 6\ cm$

Sol.405.(d) Altitude = $\frac{\sqrt{3}}{2} \times 10 = 5\sqrt{3}\ cm$

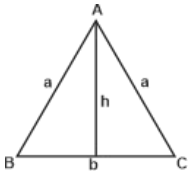
Sol.406.(b) Curved surface area of cylindrical pillar = 66 m^2
$\Rightarrow 2\pi RH = 66$ ___(1)
Volume of the cylindrical pillar = 231 m^3
$\Rightarrow \pi R^2 H = 231$ ___(2)
Divide equation (2) by (1)
$\Rightarrow \frac{\pi R^2 H}{2\pi RH} = \frac{231}{66} \Rightarrow \frac{1}{2}R = \frac{7}{2} \Rightarrow R = 7\ m$

Sol.407.(a) Radius of the cylinder = 2r
Height of the cylinder = h/2
Ratio of the new volume to the previous volume = $\pi \times (2r)^2 \times \frac{h}{2} : \pi r^2 h$
$= \pi \times 4r^2 \times \frac{h}{2} : \pi r^2 h \Rightarrow 2 : 1$

Sol.408.(c) Given,
two side are 10 cm and 8 cm
Let , 3rd side = x
Area of the triangle = $16\sqrt{6}\ cm^2$
S = $\frac{18 + x}{2}$
Area of the triangle
$= \sqrt{s\ (s - a)(s - b)(s - c)}$
$16\sqrt{6} = \sqrt{(\frac{18+x}{2})\ (\frac{18+x}{2} - 10)(\frac{18+x}{2} - 8)(\frac{18+x}{2} - x)}$
x = 14 cm

Sol.409.(a) The sides of a triangle are in the ratio of $\frac{2}{5} : \frac{1}{3} : \frac{3}{5}$ = 6x : 5x : 9x
6x + 5x +9x = 110 ⇒ 20x = 110
⇒ x = $\frac{110}{20}$
Shortest side of the triangle
$= 5 \times \frac{110}{20}$ = 27.5 cm

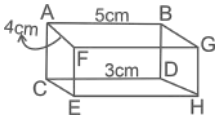
Sol.410.(b)



Given , h = 12 cm , perimeter of triangle = 36 cm
2 a + b = 36
Applying pythagoras law
$P^2 + B^2 = H^2$
$12^2 + 5^2 = 13^2 \Rightarrow 169 = 169$
Let , a = 13 , b = 10
perimeter of triangle = 36 cm
2 × 13 + 10 = 36
36 = 36 (LHS = RHS)
Area of triangle = $\frac{1}{2} \times 10 \times 12 = 60\ cm^2$

Sol.411.(b) Circumference and Area of a circle are numerically equal.
$\Rightarrow \pi R^2 = 2\pi R \Rightarrow R = 2\ unit$

Sol.412.(d)



Maximum length of a stick = diagonal
$= \sqrt{l^2 + b^2 + h^2} = \sqrt{3^2 + 4^2 + 5^2}$
$= \sqrt{9 + 16 + 25} = \sqrt{50} = 5\sqrt{2}$ cm

Sol.413.(b) Given ,
area of the circle = area of the square
So , $\pi r^2 = a^2$,
a = $\sqrt{\pi r^2}$
Now for , circumference of the circle : perimeter of the square
$2\pi r : 4a$ -------- (i)
Putting the value ' a ' in equation (i)
$2\pi r : 4\sqrt{\pi r^2} \Rightarrow \sqrt{\pi} : 2$

Sol.414.(c) Volume of the sphere = volume of the cone
$\frac{4}{3}\pi r^3 = \frac{1}{3}\pi r^2 h$
$4 \times 6^3 = 4^2 h$
⇒ 864 = 16 h ⇒ h = 54 cm

Sol.415.(b) Volume of hemispherical bowl = n × volume of small conical bottle
$\Rightarrow \frac{2}{3}\pi \times 12^3 = n \times \frac{1}{3}\pi \times (1.5)^2 \times 4$
$\Rightarrow 2 \times 1728 = n \times 2.25 \times 4$
$\Rightarrow n = \frac{2 \times 1728}{2.25 \times 4} = 384$

Sol.416.(c)
Perimeter of 1st square = 48 cm = 4a
Side = a = 12 cm
Perimeter of 2nd square = 60 cm
Side = 15 cm
Difference of area
$= 15^2 - 12^2 = 225 - 144 = 81$
Side of 3rd square = 9 cm
Perimeter of 3rd square = $9 \times 4 = 36\ cm$

Sol.417.(b) Capacity of cylindrical tank = 38,500 litres
Volume of the tank = 38.5 m^3
$\Rightarrow \frac{22}{7} \times R^2 \times 4 = 38.5$
$\Rightarrow R^2 = \frac{38.5 \times 7}{88} = 3.0625$
$\Rightarrow R = 1.75m$
Diameter = $2 \times 1.75 = 3.5\ m$

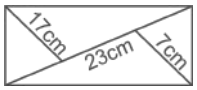
Sol.418.(b) Radius of the inner circle = r and outer circle = R

So, $2\pi r = 56\frac{4}{7}$, $2\pi R = 94\frac{2}{7}$

$r = (56\frac{4}{7}) \times \frac{7}{44}$ = 9 meter

$R = (94\frac{2}{7}) \times \frac{7}{44} = 15 \Rightarrow R - r = 6$

Sol.419.(a)



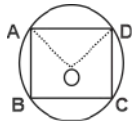
Area of the quadrilateral = Area of both triangles

$= \frac{1}{2} \times 23 \times 17 + \frac{1}{2} \times 23 \times 7$

$= \frac{1}{2} \times 23(17 + 7)$

$= 23 \times 12 = 276\ cm^2$

Sol.420.(d)



Circumference of the circle = 44 cm

$2\pi r = 44 \Rightarrow r = 7$

So , BD = 14 cm

Diagonal of square = $\sqrt{2}$ × side

$14 = \sqrt{2} \times$ side $\Rightarrow$ side = $7\sqrt{2}$

$\therefore$ area of square =$(7\sqrt{2})^2$ = 98 cm²

Sol.421.(a)

Perimeter of the square = 4a (a = side)

Circumference of the circle = $2\pi R$

A/Q, $4a = 2\pi R$

$\Rightarrow \frac{a}{R} = \frac{\pi}{2}$

$\frac{area\ of\ square}{area\ of\ circle} = \frac{\pi \times \pi}{\pi \times 2 \times 2} = \pi : 4$

Sol.422.(b) Volume of bigger cube = n × volume of smaller cube

$\Rightarrow 20^3 = n \times 4^3 \Rightarrow 8000 = 64\ n$

$\Rightarrow n = \frac{8000}{64} = 125$

Sol.423.(c) L = 12 + 24 = 36 cm,

b = 12 cm , h = 6 cm

Volume of the cuboid = l × b × h

= 36 × 12 × 6 = 2592 cm³

Sol.424.(b) Given, length = 30 m, breadth = 20 m and height = 40 m

Area of the four wall = 2 (l + b)h

Area of the four wall = 2 (30 + 20) × 40

= 4000 m²

Sol.425.(d) $\frac{2\pi rh}{2\pi rh + 2\pi r^2} = \frac{2}{5}$

$\Rightarrow \frac{h}{r + h} = \frac{2}{5}$

if h = 2 units, then r = (5 - 2) = 3 units.

ratio of the height to the radius of the cylinder = 2 : 3

Sol.426.(c)

Let breadth = 20x , length = 21x

Area = 21x × 20x = 210 $\Rightarrow$ x = $\frac{1}{\sqrt{2}}$

Breadth = $20 \times \frac{1}{\sqrt{2}} = 10\sqrt{2}\ m$

Sol.427.(d) Here from the given options only the triplet : 5, 7, 4 can be the measures of the sides of a triangle.

Because 5 + 7 > 4 , 7 + 4 > 5 and also 5 + 4 > 7 ;

Sol.428.(a) Let the radius = r ; and surface area = $4\pi r^2$;

As the radius of a sphere is tripled ,

Then its surface area is increased by = 4 $\pi(3r)^2 - 4\pi r^2 = 8 \times 4\pi r^2$;

So, the increased percentage

= 8 × 100 % = 800 %

Sol.429.(b)

Radius of the semicircle = 7 cm

Area of the shaded region = Area of the rectangle - Area of the semicircle

$= 14 \times 10 - \frac{1}{2} \times \frac{22}{7} \times 7 \times 7$

= 140 - 77 = 63 cm^2

Sol.430.(a) Area of path

= (10 + 5 + 5) × (8 + 5 + 5) - 10 × 8

= 360 - 80 $\Rightarrow$ $280\ m^2$

Sol.431.(d)

Let the width of the rectangle = x m

A/Q,

Area of the rectangle = Area of the Square

$\Rightarrow 121 \times x = 44 \times 44$

$\Rightarrow x = \frac{44 \times 44}{121} = 16\ m$

Sol.432.(b)

Circumference of circle = $2 \times \frac{22}{7} \times 70$

$= 440\ cm$

Perimeter of square = circumference of circle

$\Rightarrow 4a = 440\ cm \Rightarrow a = 110\ cm$

Side of the square = 110 cm

Sol.433.(a) Length of the rectangle = p

Breadth = $\frac{p}{3}$

Area of the rectangle = p × $\frac{p}{3} = \frac{p^2}{3}$

Sol.434.(b) Ratio of the volume between two sphere = 8 : 27

Let , ratio of there radius = r : R

$\frac{\frac{4}{3}\pi r^3}{\frac{4}{3}\pi R^3} = \frac{8}{27}$

$\frac{r^3}{R^3} = \frac{8}{27} \Rightarrow \frac{r}{R} = \frac{2}{3}$

Then , ratio of their area = $4\pi r^2 : 4\pi R^2$

ratio of their area = 4 : 9

Sol.435.(a) Area of the square = a^2

$\rightarrow 2 = a^2$ So , a = $\sqrt{2}$

Then , Diagonal of a square field = $\sqrt{2}$a

= $\sqrt{2} \times \sqrt{2}$ = 2

Sol.436.(c) Volume of sphere = $\frac{4}{3}\pi r^3$

Volume of cylinder = $\pi r^2 h$

A/Q,

$\Rightarrow \frac{4}{3}\pi r^3 + \pi r^2 h = \frac{7}{3}\pi r^3$

$\Rightarrow \pi r^2(\frac{4}{3}r + h) = \frac{7}{3}\pi r^3$

$\Rightarrow \frac{4}{3}r + h = \frac{7}{3}$r

$\Rightarrow (\frac{7}{3} - \frac{4}{3})r = h \Rightarrow r = h = 1$

Sol.437.(a)

Volume of cuboid = $54 \times 18 \times 6 = 5832$

A/Q

volume of cube = volume of cube

$\Rightarrow a^3 = 5832 = 18^3 \Rightarrow a = 18\ cm$

Sol.438.(b) Given , r = 6 m , height = 5 m and radius of sphere = 3 m

Volume of the cylinder = $\pi r^2 h$

Volume of the spheres = $\frac{4}{3}\pi r^3$

Number of solid spheres made from the given cylinder = $\frac{\pi r^2 h}{\frac{4}{3}\pi r^3} = \frac{\pi(6^2)(5)}{\frac{4}{3}\pi(3)^3}$

= $\frac{180}{36}$ = 5

Sol.439.(d) As we know :

Area of rhombus = $\frac{1}{2} \times (p \times q)$

Where p, q are the diagonals of the rhombus.

So, here $\frac{1}{2} \times (p \times q) = k$ and p = 2q ;

i.e. p = $2\sqrt{k}$ and q = $\sqrt{k}$

Then the side of the rhombus

$= \frac{1}{2} \times \sqrt{(2\sqrt{k})^2 + (\sqrt{k})^2} = \sqrt{\frac{5k}{4}}$

Sol.440.(b)

Area of the square field = 10,000 m^2

$\Rightarrow a^2 = 10000 \Rightarrow a = 100\ m$

Diagonal of the square = Side of other square = $100\sqrt{2}$

Perimeter = $4 \times 100\sqrt{2} = 400\sqrt{2}\ m$

Sol.441.(d)

Let width of the rectangle = x m
Length = x + 5 m
Perimeter of rectangle = 2 (x + 5 + x)
= 4x + 10
Area of the rectangle =x(x + 5)
A/Q,

$$4x + 10 = \frac{x(x+5)}{3}$$

$$\Rightarrow 12x + 30 = x^2 + 5x$$

$$\Rightarrow x^2 - 7x - 30 = 0$$

$$\Rightarrow x^2 - 10x + 3x - 30 = 0$$

$$\Rightarrow x(x - 10) + 3(x - 10) = 0$$

$$\Rightarrow (x - 10)(x + 3) = 0$$

$$x = 10 \ or \ -3$$

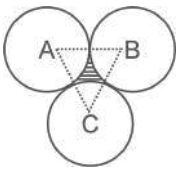
(Length can't be negative)
x = 10
Perimeter = $4 \times 10 + 10 = 50\ m$

Sol.442.(c) The length, breadth and height of a room are in the ratio 4: 3: 2
Initial area of the four walls = 2 bh + 2lh
= 2 (3× 2 + 4 × 2)
= $2 \times 14 = 28\ sq\ unit$
If Length and height is halved and breadth is doubled
Ratio of length breadth and height
= 2 : 6 : 1
New area of the four walls
= 2 (6× 1 + 2 × 1)
= $2 \times 8 = 16\ sq.\ unit$
Decrease in area = 28 - 16 = 12
Percentage decrease

$$= \frac{12}{28} \times 100 = 42.86\%$$

Sol.443.(a)
Area of the 4 walls and bottom of tank
$= 2lh + 2bh + lb$
= 2× 25 × 6 + 2 × 12 × 6 + 25 × 12
= 300 + 144 + 300 = 744 m^2
The cost of plastering = 75 paise per m^2
Total cost = $744 \times \frac{75}{100} = Rs\ 558$

Sol.444.(c)



AB = 2 × radius of the circle
AB = 2 × 3.5 = 7 cm
AB = BC = AC = 7 cm
Area of the equilateral triangle

$$= \frac{\sqrt{3}}{4} \times 7 \times 7 = \frac{49\sqrt{3}}{4} cm^2$$

$= 21.217\ cm^2$
Area of each sector

$$= \frac{60}{360} \times \frac{22}{7}\ 3.5 \times 3.5 = 6.416\ cm^2$$

Area of all three sectors = 3 × 6.416
= 19.25 cm²
Area of shaded region = 21.217 - 19.25
= 1.967 cm²

Sol.445.(b) Given, heights of the two cone = 16.4 cm and 17.2 cm
Radius of their base = 8.4 cm
Total volume = $\frac{1}{3} \pi \times (8.4)^2$

$$(16.4 + 17.2) = \frac{1}{3} \pi \times (8.4)^2 \times 33.6$$

A/Q,

$$\frac{1}{3} \pi \times (8.4)^2 \times 33.6 = \frac{4}{3} \pi \times (r)^3$$

$$\Rightarrow (r)^3 = \frac{8.4 \times 8.4 \times 33.6}{4}$$

$$\Rightarrow r = \sqrt[3]{\frac{8.4 \times 8.4 \times 33.6}{4}} = 8.4\text{cm}$$

So, diameter of the sphere (2r) = 16.8 cm

Sol.446.(b) Let the equal sides of the isosceles triangle = x cm
A/Q, $\frac{6x}{5} + x + x = 32$

$$16x = 160 \Rightarrow x = 10$$

So, sides of the triangles are 10,10 and 12

Area of isosceles triangle = $\frac{b}{4} \times \sqrt{4a^2 - b^2}$

Required area = $\frac{12}{4} \times \sqrt{4 \times 100 - 144}$

$= 3 \times 16 = 48\ cm^2$

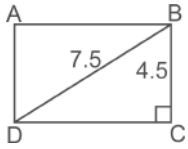
Sol.447.(b)
Given, surface area of cube = 6 side²

$$\Rightarrow 6a^2 = 3750 \Rightarrow a^2 = 625 \Rightarrow a = 25$$

So ,
volume of the cube $= side^3$
$= 25^3 = 15{,}625\ cm^3$

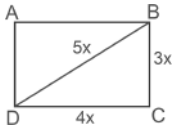
Sol.448.(b) Let l be length and b be the breadth of the rectangle .
Area of rectangle = lb
Perimeter of the rectangle = 2 (l + b)
= 340m
Since, boundary is 1 m broad ,
Then , area of boundary
$\rightarrow \{(l + 2)(b + 2)\} - lb$
$lb + 2l + 2b + 4 - lb = 2(l + b) + 4$
⇒ 340 + 4 = 344 m^2
Cost of gardening the boundary
= 344 × 10 = 3440 Rs.

Sol.449.(a)



Given,
diagonal of the rectangular closet = 7.5 ft
And shorter side of the closet = 4.5 ft
Larger side of the closet
$= \sqrt{7.5^2 - 4.5^2} = \sqrt{36} = 6$ ft
Now,
area of the closet = shorter side × larger side
= 4.5 × 6 = 27 ft²

Sol.450.(c)



Length : Breadth = 4 : 3
Diagonal of rectangle = $\sqrt{(4)^2 + (3)^2} = 5$
Required Ratio → Length : diagonal = 4 : 5

Sol.451.(c) Given, C.S.A of cylinder = 440 cm² and base circumference = 44 cm
C.S.A of cylinder = $2 \pi r h$
$2 \pi r h = 440 \Rightarrow 44h = 440 \Rightarrow h = 10$
$\Rightarrow 2 \pi r = 44$

$$2 \times \frac{22}{7} \times r = 44 \Rightarrow r = 7$$

Now, volume of the cylinder = $\pi r^2 h$

$$= \frac{22}{7} \times 7 \times 7 \times 10 = 1540\ \text{cm}^3$$

Sol.452.(c)
Given, h = 24 cm, thickness (R - r) = 1 cm
We know that volume of hollow cylinder = π(R² - r²) × h
⇒ π [(R + r) (R - r)] × h = 96 π
∵ { a² - b² = (a + b) (a - b) }
⇒ (R + r) × 1 × 24 = 96

$$\Rightarrow (R + r) = \frac{96}{24} = 4$$

Sol.453.(c) Given, diagonal = 16 unit and slant height = 17
The vertical height divides the diagonal into two equal parts.
So, slant height =
$\sqrt{(half\ of\ diagonal)^2 + (vertical\ height)^2}$
$17 = \sqrt{(8)^2 + (vertical\ height)^2}$
$289 - 64 = (vertical\ height)^2$
Hence $vertical\ height = \sqrt{225} = 15$

Sol.454.(c) Formula for the Area of a regular hexagon = $6 \frac{\sqrt{3}}{4}$ a²
Where a = side of hexagon
And given a = 6 cm
So Area = $6 \times \frac{\sqrt{3}}{4} \times 6 \times 6 = 54\sqrt{3}$ cm²

Sol.455.(c) Let the edges of the cuboid be x , 2x and 3x .
Total Surface area of cuboid
= 2 × (lb + bh + hl)
$2 \times (2x^2 + 6x^2 + 3x^2) = 88\ cm^2 \rightarrow$ x = 2 cm
Volume of the cuboid (lbh)
$\rightarrow 2 \times 4 \times 6 = 48\ cm^3$

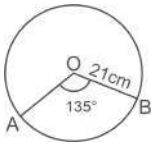
Sol.456.(a) Ratio of the radius of sphere (R) and radius of cylinder (r) = 3 : 1
Volume of sphere = volume of cylinder

$\frac{4}{3}\pi R^3 = \pi \times r^2 \times h$

$h = \frac{R^3 \times 4}{r^2 \times 3} = \frac{3 \times 3 \times 3 \times 4}{1 \times 1 \times 3} = 36$

So , the height of the cylinder is equal to 36 times the radius of cylinder .

Sol.457.(d)



Circumference of circle = $2\pi r$ = 132 cm

r = 21 cm

Length of sector (AB) = $\frac{\theta}{360°} \times 2\pi r$

$= \frac{135°}{360°} \times 132 = \frac{9 \times 22}{4} = 49.5$ cm

Perimeter of Sector AOB = 49.5 + AO + BO → 49.5 + 21 + 21 = 91.5 cm

Sol.458.(d) If a cone is recast into sphere then volume will be equal

$\frac{4}{3}\pi r^3 = \frac{1}{3}\pi R^2 h \rightarrow r^3 = \frac{R^2 \times h}{4}$

$r^3 = \frac{8 \times 8 \times 32}{4} = 8 \times 8 \times 8$

$r = \sqrt[3]{8 \times 8 \times 8} = 8$cm

Sol.459.(c)

Volume of the hemisphere be = $\frac{2}{3}\pi R^3$

Volume of the cone be = $\frac{1}{3}\pi R^2 H$

A.T.Q . ,

Hemispherical metallic solid be melted into the cone having same radius

Therefore, $\frac{2}{3}\pi R^3 = \frac{1}{3}\pi R^2 H \Rightarrow H = 2R$

Sol.460.(d)

Curved surface area of metal pipe = $2\pi rh$

$= 2 \times \frac{22}{7} \times 21 \times 90$

$= 2 \times 22 \times 90 \times 3 = 11880\ cm^2$

Sol.461.(c)

Diagonals of a rhombus is 5x and 4x

$\frac{area\ of\ rhombus}{product\ of\ diagonals} = \frac{\frac{1}{2} \times d_1 \times d_2}{d_1 \times d_2}$

$= \frac{1}{2}$

Sol.462.(a) Volume of a cone = $\pi r^2 h$

According to the question

$\frac{\pi r^2 h}{\pi R^2 H} = \frac{1}{10} \Rightarrow \frac{\pi r^2 2}{\pi R^2 5} = \frac{1}{10}$

$\frac{r^2}{R^2} = \frac{1}{4} \Rightarrow \frac{r}{R} = \frac{1}{2}$

Sol.463.(b)

Total surface area of cone = $\pi r(r + l)$

$= \pi\frac{r}{2}(\frac{r}{2} + 2l) \Rightarrow \pi r(l + \frac{r}{4})$

Sol.464.(d) Let the breadth of rectangular park = x metre

And the length of rectangular park

$= (x + 20)$ m

According to question ,

perimeter of rectangular park = 2 $(l + b)$

$= \frac{5300}{26.50} = 200$

2 $(l + b) = 200 \rightarrow 2x + 20 = 100$

$x = \frac{80}{2} = 40$ m

So length of park = $(x + 20) = 60$ m

Sol.465.(c) According to question,

Radius of sector = slant height of cone

Area of sector = curved surface area of cone

$\frac{120°}{360°} \times \pi \times 21 \times 21 = \pi \times r \times 21$

r = 7 cm

Sol.466.(b) if two triangle are similar,

$\frac{area\ of\ smaller\ triangle}{area\ of\ larger\ triangle}$

$= (\frac{side\ of\ smaller\ triangle}{side\ of\ larger\ triangle})^2$

$\frac{area\ of\ smaller\ triangle}{72} = \frac{1}{9}$

Area of smaller triangle = $\frac{72}{9} = 8\ cm^2$

Sol.467.(a)

Let , the side of a square is 'a'

If the cylinder is made by rolling square along its sides then circumference of base of cylinder

will be equal to the side of the square .

$\Rightarrow 2\pi r = a \rightarrow r = \frac{a}{2\pi}$

Required ratio ⇒ side of square : base radius of cylinder → a : $\frac{a}{2\pi} = 2\pi : 1$

Sol.468.(c) Volume of cone = $\frac{1}{3}\pi r^2 h$

$= \frac{1}{3}\pi \times 2 \times 2 \times 2 = \frac{8}{3}\pi\ cm^3$

Volume of hemisphere = $\frac{2}{3}\pi r^3$

$= \frac{2}{3}\pi \times 2 \times 2 \times 2 = \frac{16}{3}\pi\ cm^3$

So , volume of solid =

Volume of cone + Volume of hemisphere

$= \frac{8}{3}\pi + \frac{16}{3}\pi = 8\pi cm^3$

Sol.469.(b)

Let the side of smaller cube = a

Volume of smaller cube = a^3

According to question ,

$8a^3 = 12 \times 12 \times 12$

$a^3 = \frac{12 \times 12 \times 12}{8} = 6 \times 6 \times 6 \Rightarrow a = 6$

Sol.470.(c)

	Initial	:	final
Ratio of width	5	:	4
Ratio of length	10	:	11
Area of rectangle	50	:	44

Area of new rectangle in percentage compared = $\frac{44}{50} \times 100 = 88\%$

Sol.471.(a) Total surface area of cuboid = 2 $(lb + bh + hl)$

Total surface area of box

$= 2(12 \times 8 + 8 \times 10 + 10 \times 12)$

$= 2(96 + 80 + 120)$

$= 296 \times 2 = 592 cm^2$

Sol.472.(c)

Volume of cylinder = $\pi r^2 h = 3850$

$r^2 = \frac{3850 \times 7}{22 \times 25} \rightarrow r = 7$ cm

Sol.473.(d) The length of a rectangle is 20 m and breath is 18 m , Including jogging track length is 24 m and breath is 22 m

Area of rectangle including jogging track is 24 × 22 = 528

Area of a rectangle is 20 × 18 = 360 then the area of jogging track is

528 - 360 = 168 m^2

Sol.474.(b) A + B + $\frac{A \times B}{100}$

- 20 - 10 + $\frac{-20 \times (-10)}{100}$ = - 28%

Sol.475.(c) According to the question

The area of rectangle is

$5X \times 4X = a^2 \times \frac{9}{20}$

$20X^2 = a^2 \times \frac{9}{20} \Rightarrow (\frac{X}{a})^2 = \frac{9}{400}$

$\frac{X}{a} = \frac{3}{20}\ then$ perimeter of

rectangle:perimeter of square = $\frac{27}{40}$

Sol.476.(c)

Surface area of sphere $(4\pi r^2) \rightarrow 1386\ m^2$

$r^2 = \frac{1386 \times 7}{4 \times 22} = \frac{63 \times 7}{4}$

$r = \sqrt{\frac{441}{4}} = \frac{21}{2}$

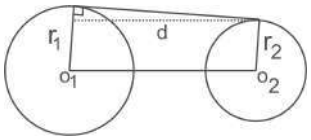
Volume of sphere = $\frac{4}{3}\pi r^3$

$= \frac{4}{3} \times \frac{22}{7} \times \frac{21}{2} \times \frac{21}{2} \times \frac{21}{2}$

Volume of sphere = 11 × 21 × 21

$= 4851\ m^3$

Sol.477.(d)



The length of common tangent to two circle , if radius r_1 and r_2 and d is the distance between their centre

$= \sqrt{d^2 - (r_1 - r_2)^2}$

Sol.478.(a)
curved surface area of cone = πrl
Ratio of C.S.A. of cone ($A_1 : A_2$) = 2 : 1
Ratio of Slant height of cone
($l_1 : l_2$) = 1 : 2
Ratio of their radii

$\frac{r_1}{r_2} = \frac{A_1}{A_2} \times \frac{l2}{l1}$

$\frac{r_1}{r_2} = \frac{2}{1} \times \frac{2}{1} \Rightarrow 4 : 1$

Sol.479.(d) Volume of a cylinder=$\pi R^2 h$
$h_1 : h_2 = 1 : 2$
According to the question $\pi R^2 h_1 : \pi r^2 h_2$

$R^2 : r^2 \rightarrow \frac{R}{r} = \sqrt{\frac{2}{1}} \rightarrow$ R : r = $\sqrt{2}$: 1

Sol.480.(c)
Let ,the side of square are a and b
A.T.Q,
$(a^2 - b^2) = 32$, $(a - b) = 4$ -----e.q .(1)
$(a^2 - b^2) = (a - b)(a + b)$
$32 = 4 \times (a + b)$
$\Rightarrow (a + b) = 8$ ------e.q .(2)
On solving the e.q .(1) and e.q .(2)
2a = 12 $\Rightarrow$ a = 6 and b = 2

Sol.481.(b)
Let the length 5x and breadth 3x
A.T.Q,
$2(5x + 3x) = 800 \Rightarrow 8x = 400 \rightarrow x = 50$
so , length = 250 and breadth = 150
Area of the field
$= 250 \times 150 = 37500\ m^2$

Sol.482.(b) Initial Final
Side 1 : 3
Volume 1 : 27
So, final volume become 27 times of its original volume

Sol.483.(d) According to the question ,
Height (h) = $2\pi r$ = circumference of base
Curved surface area of a cylinder
$= 2\ \pi rh = h \times h = h^2$

Sol.484.(b) Volume of the sphere = $\frac{4}{3}\pi r^3$
Surface area of sphere = $4\pi r^2$
According to the question,

$\frac{\frac{4}{3}\pi r^3}{4\pi r^2} = 27 \Rightarrow \frac{r}{3} = 27 \rightarrow$ r = 81cm

Sol.485.(d) Volume of cylinder = $\pi r^2 h$
$\frac{22}{7} \times 7 \times 7 \times h = 3080$
$h = \frac{3080}{22 \times 7} \Rightarrow h = 20m$

Sol.486.(a) Number of carpet required
(n) = $\frac{area\ of\ floor}{area\ of\ each\ carpet}$
$n = \frac{40 \times 24}{6 \times 4} = 40$

Sol.487.(b) The lateral surfaces of a pyramid are triangles with a common vertex. (true)
Volume of a pyramid = $\frac{1}{3}$ x area of base × vertical height (true)

Sol.488.(c) Ratio → length : breadth = 2 :1
Volume of cylinder = $\pi r^2 h$
Volumes of the cylinders formed by folding the sheet along its length = V_1
Volumes of the cylinders formed by folding the sheet along its breadth = V_2

$\frac{V_1}{V_2} = \frac{\pi \times 1 \times 1 \times 1}{\pi \times \frac{1}{2} \times \frac{1}{2} \times 2} = \frac{2}{1}$

$V_1 : V_2 = 2 : 1$

Sol.489.(c)
Total surface area of cylinder = 462cm^2
Then , curved surface area
$= \frac{462}{3} = 154\ cm^2$
T.S.A. = C.S.A. + $2\pi r^2$
$2\pi r^2 = 462 - 154 = 308$
$r^2 = \frac{308 \times 7}{22 \times 2} \Rightarrow$ r = 7cm
We know that , C.S.A. = $2\pi rh$
$2\pi rh = 154\ cm^2$
$h = \frac{154 \times 7}{2 \times 22 \times 7} \Rightarrow h = 3.5$ cm
Then, volume of cylinder ($\pi r^2 h$)
$= \frac{22 \times 7 \times 7 \times 3.5}{7} = 539\ cm^3$

Sol.490.(a) Given, radius of the cone = 14 cm and C.S.A of the cone = 2200 cm^2
As we know that, C.S.A of cone = πrl
$\Rightarrow \pi rl = 2200 \Rightarrow \frac{22}{7} \times 14 \times l = 2200$
$\Rightarrow l = 50\ cm$
Now, Height of the cone
$= \sqrt{50^2 - 14^2} = \sqrt{2304} = 48\ cm$

Sol.491.(b) Given, Length = 5 cm, breadth = 4 cm and height = 3 cm
Volume of one match box → lbh
= 3 × 4 × 5 = 60 cm^3
Volume of those 12 match box → 12 × 60 = 720 cm^3

Sol.492.(a) Given, length of rectangle = 6 cm and breadth of rectangle = 8 cm
Then,diagonal of rectangle
$= \sqrt{6^2 + 8^2} = 10\ cm$,
Now , side of the square = 10 cm
Then, area of the square = 10 × 10
= 100cm^2

Sol.493.(b) Total surface area of the cube = 96 cm^2
T.S.A. of cube = $6 \times side^2 = 96$
$side = \sqrt{16} \Rightarrow side = 4\ cm$

Sol.494.(c) Diagonal of cube = side × $\sqrt{3}$
side of cube(a) = 3
Then ,diagonal of cube = $3\sqrt{3}$ cm

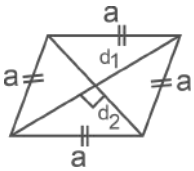
Sol.495.(d) Volume of sphere = $\frac{4}{3}\pi r^3$
Big sphere diameter = 12, then R = 6
Small sphere diameters = 6 and 10
then radii = 3 and 5
$\frac{4}{3}\pi(6)^3 = \frac{4}{3}\pi(3^3 + 5^3 + r^3)$
$\Rightarrow 216 = (27 + 125 + r^3)$
$\Rightarrow r^3 = 64$, r = 4
Surface area of sphere ($4\pi r^2$) =
$4 \times \pi \times 16 = 64\pi$

Sol.496.(a)
Given, area of the sphere = 1386 cm^2
Surface area of the sphere = $4\pi r^2$
$4\pi r^2 = 1386 \Rightarrow r^2 = \frac{1386 \times 7}{22 \times 4}$
$r = \sqrt{\frac{1386 \times 7}{22 \times 4}} \Rightarrow r = \frac{21}{2}$ cm
So, diameter of the sphere = 21 cm

Sol.497.(d) Total surface area of the cuboid = 2(lb + bh + hl)
$236\ cm^2 = 2\ \{(8 \times b) + (b \times 6) + (6 \times 8)\}$
236 = 28b + 96
$\Rightarrow$ breadth (b) = $\frac{140}{28}$ = 5 cm

Sol.498.(c)
Volume of the wall (lbh) = 1.6m × 1m × 20cm = (160 × 100 × 20) cm^3
And volume of the bricks
= (10 × 8 × 4) cm^3
So, the required bricks to build the wall be → $\frac{160 \times 100 \times 20}{10 \times 8 \times 4}$ = 1,000

Sol.499.(a)



Area of Rhombus
= $\frac{1}{2}$ × (1st diagonal) × (2nd diagonal)

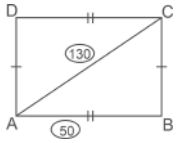
Area of Rhombus = $\frac{1}{2}$ × 51 × 52

= 1326cm^2

Sol.500.(b) Perimeter of quadrilateral
= sum of all its sides
Ratio of sides of quadrilateral
⇒ 2 : 3: 4 : 5
2x + 3x + 4x + 5x = 196 cm
⇒ x = 14 cm
Shortest side (2x) = 28 cm

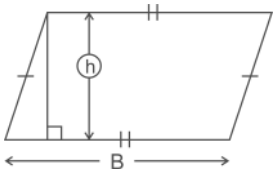
Sol.501.(b) Area of rectangle
= (length × breadth)
10140 cm^2 = length × 65 cm
Length = 156 cm
Perimeter of rectangle
= 2 (length + breadth)
Perimeter of rectangle = 2 (65 + 156)
Perimeter of rectangle = 442 cm

Sol.502.(d)



In Δ ABC
$AC^2 = AB^2 + BC^2$
$BC^2 = 130^2 - 50^2$
⇒ BC = 120 cm
Now , Perimeter of rectangle
= 2 (length + breadth)
Perimeter of rectangle = 2 (50 + 120)
Perimeter of rectangle = 340 cm

Sol.503.(c) Let, height will be x cm , then base of parallelogram be 3x cm ,

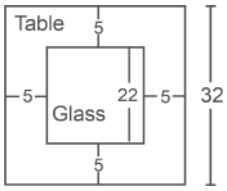


Area of parallelogram = base × height
1083 cm^2 = 3x × x
⇒ x^2 = 361 ⇒ x = 19 cm
Then , height = 19 cm and base
= 57 cm

Sol.504.(b) Given that,
Volume of conference room is 1188 m^3
and Floor area is 99m^2
By using formula ,
Volume of room
= Length × Breadth × height ..... (1)
Floor area = Length × Breadth ..... (2)
By using equation (1) and equation (2) ,
we get Height = $\frac{volume\ of\ room}{floor\ area}$
Height = $\frac{1188}{99}$ = 12 cm

Sol.505.(c) Circumference of circle = 2πr
As , we know that circumference is directly proportional to radius of circle
if radius is increased 6 times then circumference is also increased by 6 times.

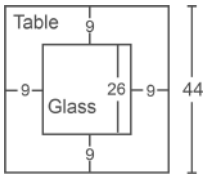
Sol.506.(c)
Area of square glass = 484 cm^2
Side of square glass = 22 cm
Margin of side between glass and table = 5 cm on each side



So,
Length of table
= 22 cm + 5 cm + 5 cm = 32 cm

Sol.507.(c) Diagonal of cube = $a\sqrt{3}$ = $8\sqrt{3}$
(here a is side of cube)
⇒ a = 8 cm
According to question ,
Volume of cube = Volume of cuboid
⇒ a^3 = L × B × H
⇒ 512 = 8 × 4 × H ⇒ H = 16 cm

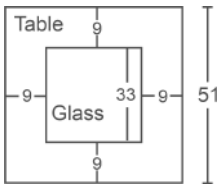
Sol.508.(c)
Area of square glass = 676 cm^2
Side of square glass = 26 cm
Margin of side between glass and table
= 9 cm (on each side)



So,
Length of table
= 26 cm + 9 cm + 9 cm = 44 cm

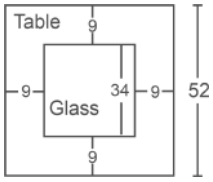
Sol.509.(a)
Diagonal of cube = $a\sqrt{3}$ = $26\sqrt{3}$
(where a is side of cube)
⇒ a = 26 cm
According to question ,
Volume of cube = Volume of cuboid
⇒ a^3 = L × B × H
⇒ 26^3 = 26 × 13 × H ⇒ 26^2 = 13 × H
⇒ H = $\frac{26 \times 26}{13}$ ⇒ H = 52 cm

Sol.510.(a)
Area of square glass = 1089 cm^2
Side of square glass = 33 cm
Margin of side between glass and table
= 9 cm (on each side)



So,
Length of table
= 33 cm + 9 cm + 9 cm = 51 cm

Sol.511.(a)
Area of square glass = 1156 cm^2
Side of square glass = 34 cm
Margin of side between glass and table
= 9 cm on each side

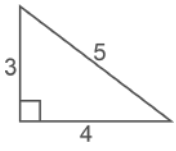


So,
Length of table
= 34 cm + 9 cm + 9 cm = 52 cm

Sol.512.(b)
Radius of cone = $\frac{1}{3}$ × Height of cone
ATQ,
Volume of cone = Volume of sphere
$\frac{1}{3} \times \pi \times r^2 \times 3r = \frac{4}{3}\pi R^3$
⇒ $r^3 = \frac{4}{3}R^3 \Rightarrow \frac{r^3}{R^3} = \frac{4}{3} \Rightarrow \frac{r}{R} = \frac{\sqrt[3]{4}}{\sqrt[3]{3}}$

Sol.513.(d) Volume of cuboid = lbh
ATQ,
(L × B)(B × H)(H × L) =$(L \times B \times H)^2$
= 20 × 32 × 40 = 25600 m^2
L × B × H = $\sqrt{25600}$ = 160
So, the Volume of cuboid = 160 m^3

Sol.514.(d)



Circumradius = $\frac{hypotenuse}{2}$ = $\frac{5}{2}$ = 2.5cm
The area of its circumcircle
= π × 2.5^2 = 6.25π cm^2

Sol.515.(a)
No of revolution in 60 minutes = 20
Then, no of revolution in 25 minutes
= $\frac{20}{60}$ × 25 = $\frac{25}{3}$
So,the radians it covers in 25 minutes
→ $\frac{25}{3}$ × 2π = $\frac{50\pi}{3}$
(As 1 revolution = 2π radian)

Sol.516.(b)

Larger radius of frustum(R) = $\frac{5}{2}$ = 2.5cm

Smaller radius of frustum(r) = radius of hemisphere = 1 cm

Height of frustum = 7 - 1 = 6 cm

Slant height of frustum(l)

= $\sqrt{(2.5-1)^2+6^2}$ = $\sqrt{(1.5)^2+36}$

= $\sqrt{38.25}$ = 6.18 cm

CSA of hemisphere = 2 × π × 1^2 = 2π cm^2

CSA of frustum = π × (1 + 2.5) × $\sqrt{\frac{153}{4}}$

= π × 3.5 × 6.18 = 21.63π cm^2

External surface area = CSA of hemisphere + CSA of frustum

= 2π + 21.63π = 23.63π

= 23.63 × $\frac{22}{7}$ = 74.26 cm^2

Sol.517.(a) Area of square when side is 1 unit = 1^2 = 1

Clearly, we can see that the area of a square is always equal to its side when the side is 1 unit.

Sol.518.(d)

Area of parallelogram = Area of triangle

b × h_1 = $\frac{1}{2}$ × $\frac{1}{2}$b × h_2

⇒ bh_1 = $\frac{1}{4}$bh_2, ⇒ $\frac{h2}{h1}$ = $\frac{4}{1}$

Sol.519.(b) Area of base of cone

= πr^2 = 64π ⇒ r^2 = 64 ⇒ r = 8

So, the height of cone

= $\sqrt{17^2-8^2}$ = $\sqrt{225}$ = 15 cm

ATQ,

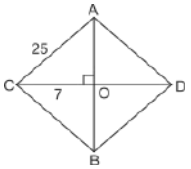
Volume of cone = Volume of sphere

⇒ $\frac{1}{3}$ × 64π × 15 = $\frac{4}{3}$×πR^3

⇒ 64 × 15 = 4R^3 ⇒ R^3 = $\frac{64\times15}{4}$ = 240

R = $\sqrt[3]{240}$ = 2$\sqrt[3]{30}$ cm

Sol.520.(a)



As we know,the diagonals of rhombus bisect each other at 90°.

Now, AO

= $\sqrt{25^2-7^2}$ = $\sqrt{625-49}$ = $\sqrt{576}$ = 24m

So, the length of other diagonal

= 24 × 2 = 48 m

Area of rhombus = $\frac{1}{2}$ × 48 ×14 = 336 m^2

Sol.521.(c)

The area of the triangle whose vertices are given by (2, 4), (- 3, - 1) and (5, 3) is:

The area of the triangle = $\frac{1}{2}$ |(2(− 1 − 3) − 3(3 − 4) + 5(4 − (− 1))|

= $\frac{1}{2}$|− 8 + 3 + 25|

= $\frac{1}{2}$|20| =10 square units

Sol.522.(b) Volume of spherical part

= $\frac{4}{3}$ × $\frac{22}{7}$ × $(\frac{21}{2})^3$ = 4851 cm^3

Volume of cylindrical part

= $\frac{22}{7}$ × $(\frac{4}{2})^2$ × 7 = 88 cm^3

The quantity of water that it can hold

= 4851 + 88 = 4939 cm^3

Sol.523.(c) Radius of cone (R)

= $\frac{1}{2}$ × (h)height of cone

Volume of cone = Volume of hemisphere

$\frac{1}{3}$π × r^2 × 2r = $\frac{2}{3}$π × R^3

⇒ 2r^3 = 2R^3 ⇒ $\frac{r^3}{R^3}$ = $\frac{1}{1}$

Sol.524.(d) Volume of solid cube

= 7^3 = 343 cm^3

Volume of conical cavity

= $\frac{1}{3}$ × $\frac{22}{7}$ × 3^2 × 7 = 66 cm^3

So, the volume of remaining solid

= 343 - 66 = 277 cm^3

Sol.525.(c) Length of 15 small rods

= $(23+\frac{2}{7})$ × 15 = 345 + 4$\frac{2}{7}$ = 349$\frac{2}{7}$m

Sol.526.(c) Volume of earth taken out of well = $\frac{22}{7}$ × $(\frac{3}{2})^2$ × 14 = 99 m^3

Outer radius of embankment

= $\frac{3}{2}$ + 4 = $\frac{11}{2}$ m

Area of embankment

= $\frac{22}{7}\{(\frac{11}{2})^2-(\frac{3}{2})^2\}$ = $\frac{22}{7}$ × $\frac{112}{4}$

= 88 m^2

Let the height of embankment be 'h'

According to question,

99 = 88 × h ⇒ h = $\frac{99}{88}$ = $\frac{9}{8}$ m

Sol.527.(b)

Let the each side of a rhombus be x

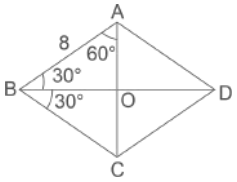
According to question,

Perimeter of Rectangle

= perimeter of rhombus

2(10 + 6) = 4a

32 = 4a ⇒ a = $\frac{32}{4}$ = 8 cm



Area of rhombus = side² × sinθ

⇒ 8 × 8 × sin 60° ⇒ 64 × $\frac{\sqrt{3}}{2}$ = 32$\sqrt{3}$ cm^2

Sol.528.(a)

Volume of 15 pipes of diameter 2r

= 15 × π × r^2h

Volume of 6 pipes of diameter 4r

= 6 × π × 4r^2h

ATQ,

15 × π × r^2h × 12 = 6 × π × 4r^2h × x

180 = 24x ⇒ x = $\frac{180}{24}$ = 7.5 min

Sol.529.(c) Let the base of triangle and parallelogram be B and b respectively

Then, B = $\frac{5}{6}$b

ATQ,

Area of triangle = Area of parallelogram

$\frac{1}{2}$BH = $\frac{6}{5}$B × h

$\frac{H}{h}$ = $\frac{6\times2}{5}$ = $\frac{12}{5}$

Sol.530.(b) Let the side of cube and square be x and y respectively

ATQ,

Sum of the length of edge

= 2 × perimeter of square

12x = 2 × 4y = 8y ⇒ x = $\frac{8y}{12}$ = $\frac{2y}{3}$

Also, $\frac{1}{4}$ × volume of cube = area of square

$\frac{1}{4}$ × x^3 = y^2 ⇒ $\frac{1}{4}$ × $\frac{8y^3}{27}$ = y^2

⇒ $\frac{2y^3}{27}$ = y^2 ⇒ y = $\frac{27}{2}$ = 13.5 unit

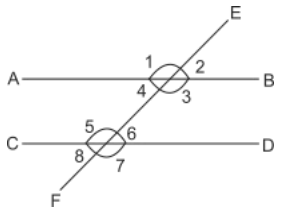
So, the side of square = 13.5 units

Geometry

LINES

1). Parallel Lines : Two or more lines which will never meet just like railway track.

2). Transverse Lines: A line which cuts parallel lines as shown in the figure below.



- EF is the transverse line. AB and CD are parallel lines. Symbol of parallel lines is '||'. To denote a line symbols like $\overline{AB}$ or simply AB are used.
- Let's take a look at various angles made by the transverse line and the parallel lines :

(i) Corresponding Angles:- $\angle 1$ and $\angle 5$, $\angle 2$ and $\angle 6$, $\angle 4$ and $\angle 8$, $\angle 3$ and $\angle 7$ are pairs of corresponding angles.
• Corresponding angles are equal. E.g. $\angle 1 = \angle 5$

(ii) Alternate Angles:- E.g. $\angle 1 = \angle 7$ or, $\angle 4 = \angle 6$ or, $\angle 3 = \angle 5$ etc.

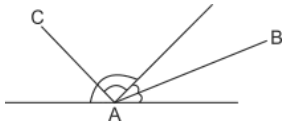
(iii) Vertically opposite angles :- E.g. $\angle 1 = \angle 3$ or, $\angle 2 = \angle 4$ etc.

(iv) Adjacent angles:- $\angle 1 + \angle 2 = 180°$ in this case as these are linear pairs. Any two angles which are adjacent are called adjacent angles. It is not necessary that their sum should be $180°$.

(v) Sum of Interior angles on same side = 2× right angles = $180°$. The angle, made by bisectors of interior angle will be $90°$.

(vi) Sum of Exterior angles on same side = $180°$
Note: From a point, an infinite number of lines can be drawn.

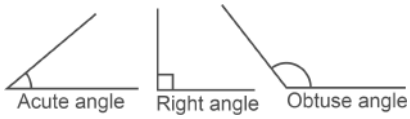
3). Internal angle bisector and External angle bisector. In the given figure AB is the internal angle bisector and AC is the external angle bisector.



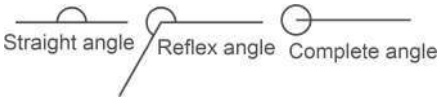
ANGLES

Various types of angles are as follows:

1). Acute Angle: Angles which are less than $90°$.
2). Right Angle: $90°$ angle is called right angle.
3). Obtuse Angle: Angles greater than $90°$ and less than $180°$.
4). Straight Angles: Angle equal to $180°$.



5). Reflex angle: Angles greater than $180°$ and less than $360°$.
6). Complete Angle: $360°$ angle is called Complete angle.

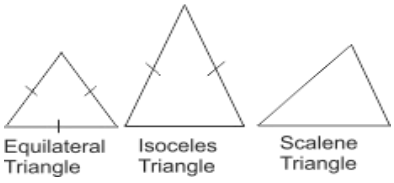


7). Complementary Angles: Sum of the angles is equal to $90°$.
8). Supplementary Angles: Sum of the angles is equal to $180°$.

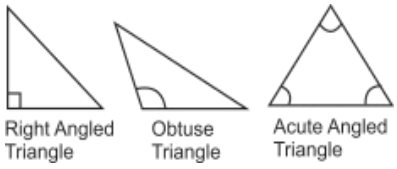
TYPES OF TRIANGLES:

1). Based on sides:-

- **Equilateral Triangles:** All three sides are equal in length.
- **Isosceles Triangles**: Any two sides are equal in length.
- **Scalene Triangle:** All three sides are different in length.

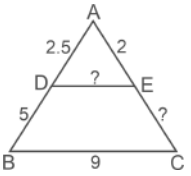


2). Based on angles :-
⇒ **Right angle triangle :-** One of the angle is $90°$.
⇒ **Obtuse angled triangle :-** One angle is more than $90°$.
⇒ **Acute angled triangle :-** All three angles are less than $90°$.



Properties of Triangles

[1.] If a line DE intersects two sides of a triangle AB and AC at D and E respectively, then : $\frac{AD}{DB} = \frac{AE}{EC}$ and $\frac{AD}{AB} = \frac{DE}{BC}$. Also if D and E are mid points of AB and AC respectively, then:
$DE = \frac{BC}{2}$ and DE will be parallel to BC.

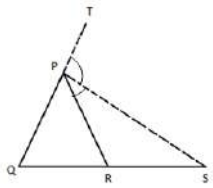


E.g. Let AD = 2.5 units; DB = 5, AE = 2 and BC = 9, then EC = ? and DE = ?
$\frac{AD}{DB} = \frac{AE}{EC} \Rightarrow EC = AE \times \frac{DB}{AD} = 2 \times \frac{5}{2.5}$
$= 4\ units$. Similarly DE = 3 units.

[2.] In case of Internal angle bisector: $\frac{PQ}{QS} = \frac{PR}{SR}$ or, $\frac{QS}{SR} = \frac{PQ}{PR}$

Here PS is the internal angle bisector and a common side of the triangles $\Delta\ PQS\ and\ \Delta PSR$.

[3.] In case of Exterior angle bisector :
$\frac{PQ}{PR} = \frac{QS}{RS}$

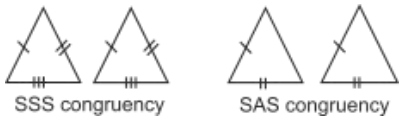


PS is the external angle bisector.

Congruency of Triangles

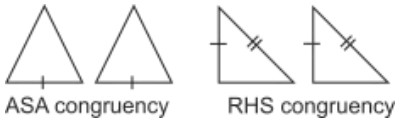
Two triangles will be congruent if:
1. SSS: (Side – Side – Side rule): When all three sides are equal.

2. SAS: (Side – Angle – Side rule): When two sides and one angle are equal.



3. ASA: (Angle – Side – Angle rule): When two angles and one side are equal.

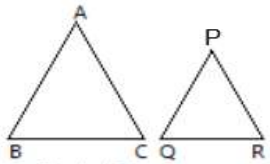
4. RHS: (Right angle – Hypotenuse – Side rule): When one side and hypotenuse of the right angled triangle are equal.



Similarity of Triangles

1). Two triangles are similar if they are just like each other, i.e. their shapes are same. The sizes of similar triangles may be different.

2). In congruency the triangles are mirror images of each other. We can say that all congruent triangles are similar but the vice versa is not true.



Similar Triangles

3). *Important properties of similar triangles:*

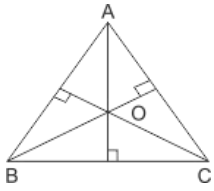
- $\frac{Areaof\ \Delta ABC}{Area\ of\ \Delta PQR} = \frac{AB^2}{PQ^2}$
  $= \frac{AC^2}{PR^2} = \frac{BC^2}{QR^2}$
- $\frac{Perimeter\ of\ \Delta ABC}{Perimeter\ of\ \Delta PQR} =$
  $\frac{AB}{PQ} = \frac{AC}{PR} = \frac{BC}{QR}$

Altitude :

- It is also known as height. The line segment drawn from the vertex of a triangle perpendicular to its opposite side is called an Altitude of a triangle.

Orthocenter:

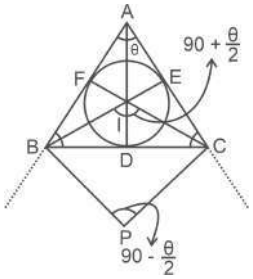
- The point at which the altitudes of a triangle intersect is called an Orthocenter.
- Generally Orthocenter is denoted by 'O'.



- Here, ∠AOC = 180° - ∠B
- In the case of a right angled triangle, the orthocenter lies at the vertex of right angle.
- In case of an obtuse angled triangle, the orthocenter lies outside the triangle.

In-center:

The point at which the *internal angle bisectors* of a triangle meet. It is generally denoted by 'I'. From the in-center the in-circle of a triangle is drawn. The radius of the in-circle is equal to ID = IE = IF.



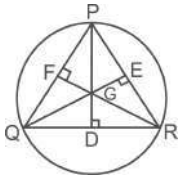
Important Results:

- $\angle BIC = 90° + \frac{\angle A}{2}$ (for Internal angle bisectors)
- $\angle BPC = 90° - \frac{\angle A}{2}$ (for external angle bisectors)
- $\frac{AB}{AC} = \frac{BD}{DC}$
- In-radius r = $\frac{Area\ of\ Triangle}{Semi-perimeter\ of\ Triangle}$
- AI :ID = AB + AC : BC
  BI : IE = AB + BC : AC
  CI : IF = AC + BC : AB
- Length of angle bisector(AD)
  $= \frac{2 \times AB \times AC\ cos\theta}{AB + AC}$

Circum-center:-

The point at which the *perpendicular bisectors* of the sides of the triangle meet.

- From the circum-center the circumcircle of a triangle is drawn. The radius of the circum-circle is equal to PG = RG = QG.

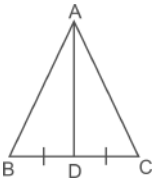


- Since the angle formed at the center of a circle is double of the angle formed at the circumference, we have:: $\angle QGR = 2\angle P$, $\angle QGP = 2\angle R$ and $\angle PGR = 2\angle Q$.
- For an obtuse angle triangle, the circumcenter lies outside the triangle.

Note: A line which is perpendicular to another line and also bisects it into two equal parts is called a perpendicular bisector.

Centroid: It is the point of intersection of *the medians* of a triangle. It is also called the center of mass.

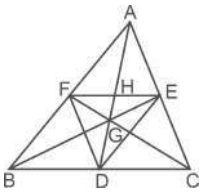
- The median is a line drawn from the vertex of a triangle to the mid − point of the opposite side.
- Each median is divided in the ratio of 2 : 1 at the centroid.
- Median divides the triangle into two equal areas.
- **Apollonius theorem:**



$AB^2 + AC^2 = 2(AD^2 + BD^2)$

Other key points for medians:

- All the medians of a triangle divide it into six parts with equal areas.
  Therefore, $Area\ of\ \Delta ABC = 6 \times Area\ of\ any\ of\ the\ smaller\ parts.$
- $Area\ of\ \Delta FEG = \frac{1}{12} \times Area\ of \Delta ABC$



- FE divides the line AG in the ratio of 3 : 1 i.e. $\frac{AH}{HG} = \frac{3}{1}$.
- Area of ΔABG = Area of ΔBCG = Area of ΔACG
- Area of ΔDEF = $\frac{1}{4}$ΔABC

Note: In case of Equilateral triangle, orthocenter, in-center, circum-center and centroid lie at the same point.

Other Facts about triangles:

1). Sum of two sides is always greater than the third side.

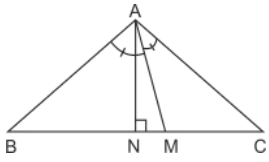
E.g. AB + BC > CA, AB + AC > BC, BC + CA > AB.

2). Difference of two sides is always less than the third side.

E.g. AB - BC < CA, AB - AC < BC, BC - CA < AB.

3). In ΔABC, ∠B > ∠C, if AM is the bisector of ∠BAC and AN ⊥ BC, then

∠MAN = $\frac{1}{2}$(∠B - ∠C)

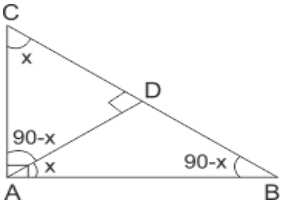


4). In right angled Δ ABC, where BD is an altitude to hypotenuse AC, then Altitude BD = $\frac{AB \times BC}{AC}$.

Similarly, if BE is a median drawn to hypotenuse AC, then BE = $\frac{1}{2}$AC. (Length of median is half the length of hypotenuse)

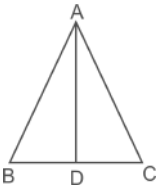
5). In right angled ΔABC, AD is

perpendicular to BC, then



- $AD^2 = BD \times DC$
- $AB^2 = BD \times BC$
- $AC^2 = CD \times BC$

Formulas of triangle :-



In case of equilateral triangle,

• Area(A) = $\frac{\sqrt{3}}{4}$ (side)^2

• Inradius(r) = $\frac{side}{2\sqrt{3}}$

• circumradius(R) = $\frac{side}{\sqrt{3}}$

• height(h) = $\frac{\sqrt{3}}{2}$ × side

In case of isosceles triangle,

•Area(A) = $\frac{BC}{4}\sqrt{4AB^2 - BC^2}$

Where AB = AC

• Inradius(r) = $\frac{area\ of\ triangle}{Semi-perimeter}$

• circumradius(R) = $\frac{AB \times BC \times AC}{4 \times Area\ of\ triangle}$

• height(h) = $\sqrt{AB^2 - \frac{BD^2}{4}}$

In case of scalene triangle,

• Area(A) = $\sqrt{s(s-a)(s-b)(s-c)}$

Where a,b,c are sides of triangle

S = $\frac{a+b+c}{2}$

In case of right angle triangle ,

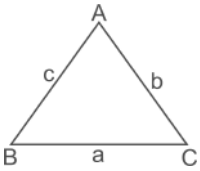
• Area(A) = $\frac{1}{2}$ × Base × height

• Inradius(r) = $\frac{Perpendicular + base - hypotenuse}{2}$

• circumradius(R) = $\frac{hypotenuse}{2}$

Note :- Distance between circumcentre and incentre of any triangle = $\sqrt{R^2 - 2Rr}$

Sine rule :-



$\frac{a}{sinA} = \frac{b}{sinB} = \frac{c}{sinC}$ = 2R

Where R = circumradius of triangle

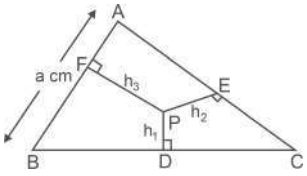
Cosine rule :-

CosA = $\frac{c^2+b^2-a^2}{2bc}$

CosB = $\frac{c^2+a^2-b^2}{2ac}$

CosC = $\frac{a^2+b^2-c^2}{2ab}$

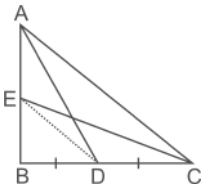
• If P is any point inside the equilateral triangle , the sum of altitude from the point P to the sides AB, BC and AC equal to the median of the triangle.



$h_1 + h_2 + h_3 = \frac{\sqrt{3}}{2}$a

Where a = side of equilateral triangle

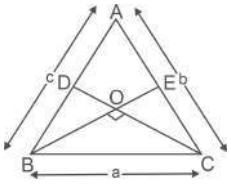
•



(i) 4(AD^2 + CE^2) = 5 AC^2

(ii) AD^2 + CE^2 = AC^2 + ED^2

•



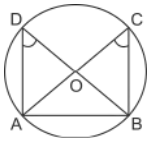
AB^2 + AC^2 = 5 BC^2

• If length of median of triangles are given then area of triangle = $\frac{4}{3}$ × area of triangle formed by medians.

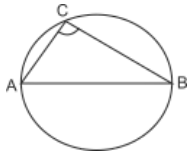
CIRCLE

Properties of circles:-

1). Angles in the same segment of a circle from the same base are always equal.

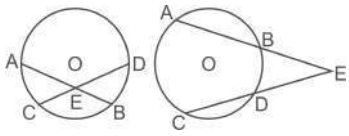


2). Angle dropped on the circumference of a circle with the diameter as base is always a right angle.



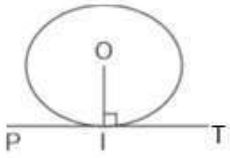
3). Two chords AB and CD of a circle intersect, internally or externally, at E then:

$AE \times EB = CE \times ED$

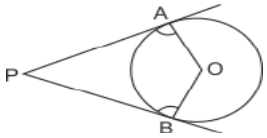


4). The tangent to a circle at a point on its circumference is perpendicular to the radius at that point.

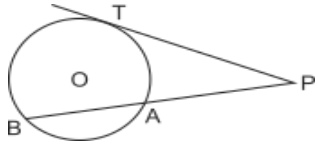
OI ⊥ PT



5). Two tangents PA and PB are drawn from an external point P on a circle with center O is equal. PA = PB

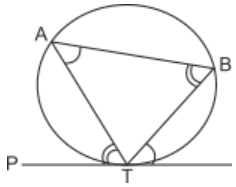


6). For a tangent, PT, and a secant, PB, drawn to a circle from a point P, we have. $PT^2 = PB \times PA$



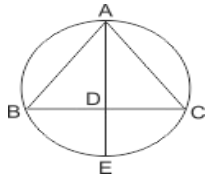
7). Angle made by a chord with a tangent is always equal to the angle dropped on any point of circumference taking the chord as base.

$\angle PTA = \angle ABT$

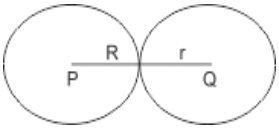


8). In the following case:

$AB \times AC + AE \times DE = AE^2$

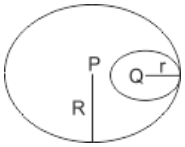


9). If two circles touch each other externally, then distance between their centres is the sum of their radius.



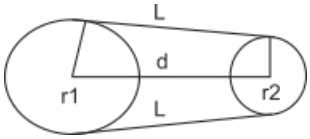
Here, PQ = R + r

10). If two circles touch each other internally, then distance between their centres is the difference of their radius.



Here, PQ = R - r

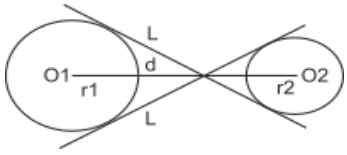
Direct common Tangents:



Length of direct common tangent (L) = $\sqrt{d^2 - (r_1 - r_2)^2}$

Where, d = distance between two centers and r_1, r_2 are radii of the circles.

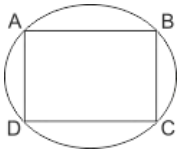
Transverse common Tangents:-



Length of transverse tangent (L) = $\sqrt{d^2 - (r_1 + r_2)^2}$

Cyclic Quadrilateral :-

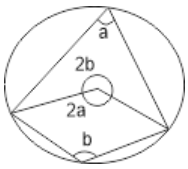
A quadrilateral drawn inside a circle with its vertices lying on the circumference.



Sum of opposite angles = 180°

i.e. $\angle A + \angle C = \angle B + \angle D = 180°$

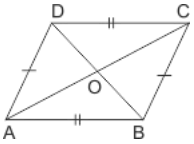
Important result: In the following type of cyclic quadrilateral remember the relationship between the angles, as shown:



QUADRILATERAL

Any closed figure that has four sides is called a quadrilateral. Depending on length of sides, orientation, they can be classified as followed:

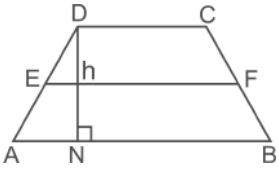
1). Parallelogram : Opposite sides are equal and parallel.



- AB = DC and AD = BC
- $\angle A + \angle B = \angle B + \angle C = \angle C + \angle D = \angle D + \angle A = 180°$
- $\angle A = \angle C$ and $\angle B = \angle D$
- The diagonals bisect each other i.e. AO = OC and OB = OD
- Area of parallelogram = Base × Altitude
- Sum of squares of all four sides = Sum of squares of diagonals

  So, $AC^2 + BD^2 = AB^2 + BC^2 + CD^2 + AD^2$
- Square, Rectangle and Rhombus are parallelogram.
- All rectangles are parallelogram but all parallelogram are not rectangles.

2). Trapezium: Only one pair of opposite sides are parallel.

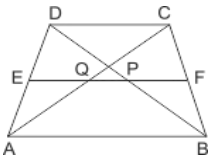


Area of trapezium ABCD

$= \frac{1}{2} \times Sum\ of\ parallel\ side \times height$

$= \frac{1}{2} \times (AB + DC) \times h$

- If E is the midpoint of $\overline{AD}$ and F is the midpoint of $\overline{BC}$, then EF = $\frac{AB + DC}{2}$.



- If P is the midpoint of diagonal $\overline{BD}$ and Q is the midpoint of diagonal $\overline{AC}$, then PQ = $\frac{AB - DC}{2}$

3). Rhombus: All sides are equal and opposite sides are parallel to each other.

$\angle A + \angle B = \angle B + \angle C =$

$\angle C + \angle D = \angle D + \angle A = 180°$

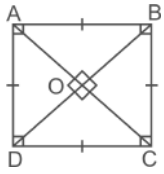
- $\angle A = \angle C$ and $\angle B = \angle D$
- $4a^2 = d_1^2 + d_2^2$

  i.e. Sum of squares of sides = Sum of squares of diagonals.
- Diagonals bisect each other at right angles and form four right angled triangles with equal areas.

$Area\ of\ \Delta AOB = \Delta BOC = \Delta COD = \Delta DOA = \frac{1}{4} \times area\ of\ rhombus\ ABCD$

- The diagonals of Rhombus are not of equal length.

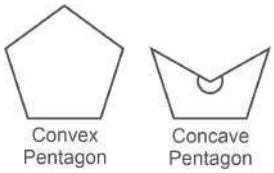
4). Square: All sides are equal in length and adjacent sides are perpendicular to each other.



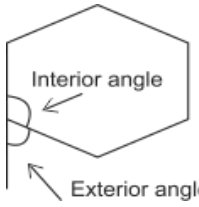
- AB = BC = CD = AD and $\angle A = \angle B = \angle C = \angle D = 90°$
- Diagonals bisect each other at right angles and form four right angled isosceles triangles.
- Diagonals are of equal length: i.e. AC = BD.
- In a rectangle the diagonals do not intersect at right angles.

5). Polygons:

- Convex polygon: All its interior angles are less than 180°.
- Concave polygon: At least one angle is more than 180°.



- Regular Polygons: All sides and angles are equal.



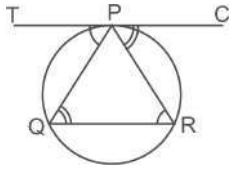
* Sum of all exterior angles = $360°$.
* Each exterior angle = $\frac{360°}{n}$, where n = number of sides.
* Exterior angle + Interior angle = 180°
* In case of convex polygon, sum of all interior angles = $(2n - 4) \times 90°$

* Number of diagonals = $\frac{n(n-3)}{2}$

Where , n = number of sides.

ALTERNATE SEGMENT THEOREM

The Alternate Segment Theorem states that : An angle between a tangent and a chord through a point of contact is equal to the angle in the alternate segment.

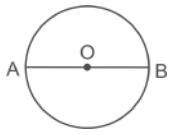


Here, in above diagram, $\overline{TC}$ is tangent. $\overline{PQ}$ and $\overline{PR}$ are chord which touches tangent $\overline{TC}$ at point P. Hence, ∠TPQ = ∠ PRQ and ∠CPR = ∠PQR

Important formulas :-

Circle :-

• If r be the radius and O be the center of the circle.

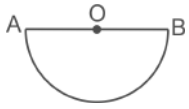


Diameter = 2× radius

Area = $\bar{\lambda}r^2$

Circumference = $2\bar{\lambda}r$

Semi -Circle :-

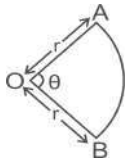


Diameter = 2 × radius

Perimeter = $(\bar{\lambda} + 2)r$

Area = $\frac{\bar{\lambda}r^2}{2}$

Sector :-

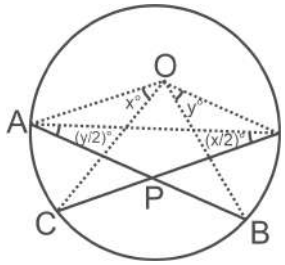


If ∠AOB = θ

Perimeter = r (2 + θ)

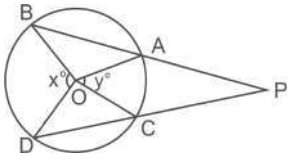
Area = $\frac{\theta}{360°} \times \bar{\lambda}r^2$

•Two Chords AB and CD of a circle with center O, intersect each other at P. If ∠AOC = x° and ∠BOD = y° then the value of ∠BPD is :-



∠BPD = $\frac{x+y}{2}$

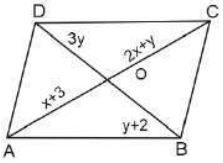
• Chords are intersecting at external points.



∠BPD = $\frac{x-y}{2}$

Variety Questions

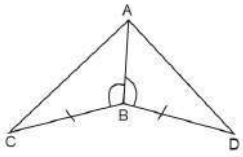
Q.1. Find x if ABCD is a parallelogram as given in figure below, with two diagonals AC and BD intersecting at O and OA = x + 3, OB = y + 2, OC = 2x + y, OD = 3y



Group D 17/08/2022 (Morning)
(a) 2 (b) 3 (c) 4 (d) 1

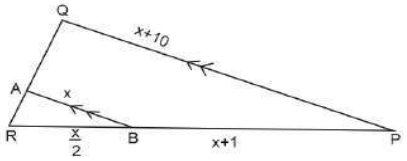
Q.2. When two transversals intersect three parallel lines, and the ratio of the intercepts formed by the first transversal is 3 : 4, then find the ratio of the intercepts formed by the second transversal.
Group D 17/08/2022 (Afternoon)
(a) 1 : 1 (b) 4 : 3 (c) 3 : 4 (d) 2 : 4

Q.3. In the given figure ∠ABC = ∠ABD , BC = BD then Δ CAB ≅ Δ.....



Group D 17/08/2022 (Evening)
(a) DBA (b) DAB (c) ADB (d) ABD

Q.4. In the given figure, AB || QP, AB = x , PQ = x + 10, RB = $\frac{x}{2}$, BP = x + 1. Find PQ



Group D 18/08/2022 (Morning)
(a) 13 units (b) 18 units
(c) 12 units (d) 14 units

Q.5. Two angles are complementary. The larger angle is 6° less than thrice the measure of the smaller angle. What is the measure of the larger angle ?
Group D 18/08/2022 (Afternoon)
(a) 66° (b) 54° (c) 63° (d) 57°

Q.6. If AB = x + 3, BC = 2x and AC = 4x - 5 , then for what value of 'x' does B lie on AC ?
Group D 18/08/2022 (Afternoon)
(a) 2 (b) 5 (c) 8 (d) 3

Q.7. Which of the following is NOT a true statement ?
Group D 22/08/2022 (Afternoon)
(a) All rectangles are parallelograms.
(b) Diagonals of a rectangle do not bisect each other.
(c) Opposite sides of a rectangle are congruent and parallel.
(d) Sum of any pair of adjacent angles of a rectangle is 180°.

Q.8. In a parallelogram, two adjacent sides are in the ratio 3 : 2 and its perimeter is 65 cm. What is the length of each of the two smaller sides of this parallelogram ?
Group D 23/08/2022 (Evening)
(a) 19 cm (b) 13 cm (c) 18 cm (d) 21 cm

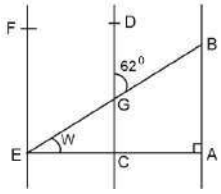
Q.9. The ratio of the sum of all the interior angles to an exterior angle of a regular polygon is 24 : 1. Find the number of sides of the polygon.
Group D 25/08/2022 (Afternoon)
(a) 80 (b) 10 (c) 78 (d) 8

Q.10. If **Δ** ABC ≅ **Δ**PQR, which of the following need NOT be NECESSARILY true ?
Group D 26/08/2022 (Morning)
(a) m($\overline{AB}$) = m($\overline{PQ}$); m($\overline{BC}$) = m($\overline{RP}$); ∠A = ∠P
(b) m($\overline{AB}$) = m($\overline{PQ}$); m($\overline{BC}$) = m($\overline{QR}$); m($\overline{CA}$) = m($\overline{PR}$)
(c) m($\overline{AB}$) = m($\overline{PQ}$); m($\overline{BC}$) = m($\overline{QR}$); ∠A = ∠P
(d) ∠A = ∠P; ∠B = ∠Q; ∠C = ∠R

Q.11. A 1.5 m tall boy is standing at a distance of 3 m from a 4 m high light post. The light from top of post casts his shadow. What is the length of the boy's shadow ?
Group D 29/08/2022 (Afternoon)
(a) 1.8 m (b) 0.91 m (c) 1.62 m (d) 4.4 m

Q.12. If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 2 : 3, then the greater of the two angles is :
Group D 30/08/2022 (Morning)
(a) 120° (b) 136° (c) 108° (d) 54°

Q.13. In the adjoining figure AB || CD and CD || EF. Also, EA ⊥ AB. If ∠BGD = 62° , then the value of w is :



Group D 01/09/2022 (Morning)
(a) 28° (b) 108° (c) 118° (d) 62°

Q.14. P is any point inside the rectangle ABCD. If PA = 27 cm , PB = 21 cm , PC = 6 cm, then the length PD (in cm) is equal to :
Group D 01/09/2022 (Afternoon)
(a) 12 (b) 18 (c) 10 (d) 15

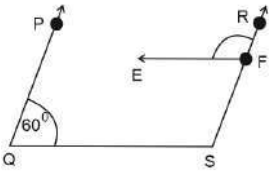
Q.15. The sides of a triangle are 15 cm, 28 cm, and 41 cm. What is the length of its altitude corresponding to the side with a length of 28 cm ?
Group D 01/09/2022 (Evening)
(a) 10 cm (b) 14 cm (c) 12 cm (d) 9 cm

Q.16. If angles A, B, C and D of a quadrilateral ABCD, taken in order, are in the ratio 3 : 7 : 6 : 4 , then ABCD is a :
Group D 02/09/2022 (Morning)
(a) rhombus (b) kite
(c) trapezium (d) Parallelogram

Q.17. For a regular polygon, the sum of the interior angles is 200% more than the sum of its exterior angles. Each interior angle of the polygon measures x°. What is the value of x° ?
Group D 02/09/2022 (Afternoon)
(a) 144° (b) 135° (c) 140° (d) 108°

Q.18. Triangle ABC is similar to triangle PQR with $\frac{BC}{QR} = \frac{1}{5}$.
Find $\frac{area\ of\ (triangle\ PQR))}{area\ of\ (triangle\ ABC)}$?
Group D 06/09/2022 (Evening)
(a) 5 (b) $\frac{1}{5}$ (c) $\frac{1}{25}$ (d) 25

Q.19. In the given figure, QS || EF and RS || PQ If m ∠PQS = 60°, then m∠RFE = ?



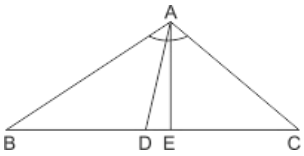
Group D 13/09/2022 (Afternoon)
(a) 110° (b) 130° (c) 120° (d) 140°

Q.20. In a rectangle PQRS, if m∠QPR = 26°, then m∠SQR = _____.
Group D 20/09/2022 (Morning)
(a) 64° (b) 74° (c) 26° (d) 52°

Q.21. The number of non-overlapping triangles that can be formed in an 11-sided polygon by joining the vertices are :
Group D 22/09/2022 (Morning)
(a) 11 (b) 10 (c) 9 (d) 8

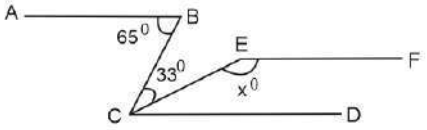
Q.22. In triangle ABC, P. Q, and R are the mid points of its sides BC, CA, and AB, respectively. If the area of triangle PQR is 6 cm², then the area of triangle ABC is :
Group D 22/09/2022 (Evening)
(a) 36 cm² (b) 12 cm²
(c) 24 cm² (d) 18 cm²

Q.23. In a triangle ABC, if AD is the angle bisector of ∠BAC , AE ⊥ BC , ∠B = 30° and ∠C = 50° , then ∠DAE is :



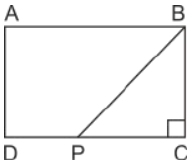
Group D 28/09/2022 (Evening)
(a) 40° (b) 30° (c) 10° (d) 20°

Q.24. In the given figure, AB || CD || EF. The value of x° is :



Group D 29/09/2022 (Afternoon)
(a) 147° (b) 126° (c) 115° (d) 148°

Q.25. Find the area of ABPD if AB = DC = 4 m , AD = BC = 2.5 m , and PC = 1 m.



Group D 06/10/2022 (Evening)
(a) 9.00 m² (b) 7.85 m²
(c) 8.75 m² (d) 6.25 m²

Q.26. The lengths of two sides of a triangle are 24 cm and 26 cm. Which of the following can be the measure of the third side ?
Group D 06/10/2022 (Evening)
(a) 48 cm (b) 55 cm (c) 52 cm (d) 54 cm

Q.27. The interior angles of an 8 - sided polygon are in the ratio 1 : 3 : 4 : 6 : 7 : 11 : 13 : 15. Find the measure of the largest interior angle in this polygon.
Group D 11/10/2022 (Morning)
(a) 288° (b) 300° (c) 270° (d) 234°

Q.28. In a circle , chords AB and CD are produced to meet at E, outside the circle . If AB = 9 cm and AE = 12 cm and ED = 4 cm, then what is the length of the chord CD?
NTPC CBT II Level 3 (14/06/2022) Shift 1
(a) 5.5 cm (b) 5 cm (c) 4 cm (d) 4.5 cm

Q.29. An equilateral triangle ABC is inscribed in a circle with radius 12 cm and center O. Find the length of each side of the triangle ABC (in cm).
NTPC CBT II Level 5 (15/06/2022) Shift 2
(a) $10\sqrt{5}$ (b) $14\sqrt{3}$ (c) $10\sqrt{3}$ (d) $12\sqrt{3}$

Q.30. Two equal circles, each having a radius of 24 cm, intersect each other, such that each passes through the centre of the other. The length of the common chord is____cm.
NTPC CBT II Level 2 (16/06/2022) Shift 3
(a) $36\sqrt{3}$ (b) $30\sqrt{3}$ (c) $36\sqrt{2}$ (d) $24\sqrt{3}$

Q.31. In ΔABC, AD is a median of the triangle, intersecting BC at D. The three medians of the triangle meet at a point G. If AG = (7y - 3) cm and DG = 3y cm, then find the length of AD.
NTPC CBT II Level 3 (17/06/2022) Shift 1
(a) 33 cm (b) 24 cm (c) 30 cm (d) 27 cm

Q.32. From a point Q, the length of the tangent to a circle is 21 cm and the distance of Q from the center 'O' of the circle is 29 cm. Find the radius of the circle.
NTPC CBT II Level 3 (17/06/2022) Shift 2
(a) 20 cm (b) 8 cm (c) 30 cm (d) 50 cm

Q.33. ABC is an equilateral triangle. P, Q and R are the midpoints of sides AB, BC and AC respectively. The length of the side of the triangle is 4 cm. The area of triangle PQR is
NTPC CBT - I 28/12/2020 (Evening)
(a) $\frac{\sqrt{3}}{9}\ cm^2$ (b) $\frac{\sqrt{3}}{2}\ cm^2$
(c) $\sqrt{3}\ cm^2$ (d) $\frac{1}{4}\sqrt{3}\ cm^2$

Q.34. In a circle with a radius 10 cm, XY and PQ are two parallel chords 12cm and 16 cm in length, respectively. The two chords are situated on the opposite sides of the centre.The distance between the chords is
NTPC CBT - I 29/12/2020 (Evening)
(a) 12 cm (b) 14 cm
(c) 12.80 cm (d) 18 cm

Q.35. In the given figure, ∠ABD = 55° and ∠ACD = 30°. If ∠BAC = y° and non-reflex ∠BDC = x°, then what is the value of x - y ?

NTPC CBT - I 05/01/2021 (Morning)
(a) 95 (b) 105 (c) 85 (d) 15

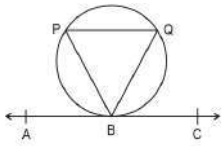
Q.36. The sides of a certain triangle are given below. Identify the one which is a right angled triangle.
NTPC CBT - I 05/01/2021 (Evening)
(a) a = 4 cm, b = 5 cm, c = 7 cm
(b) a = 5 cm, b = 5 cm, c = 6 cm
(c) a = 4 cm, b = 5 cm, c = 66 m
(d) a = 7 cm, b = 24 cm, c = 25 cm

Q.37. In which of the following cases is △ ABC similar to △ PQR?
NTPC CBT - I 05/01/2021 (Evening)
(a) Angles A =40^0, B=60^0, C=80^0, P=40^0, Q=20^0, R=120^0
(b) Sides AB=3cm, BC=7.5 cm, CA= 5cm, PQ=4.5 cm, QR=7.5 cm, RP= 6 cm
(c) Angles A =50^0, B= 70^0, C =60^0, P= 50^0, Q=60^0, R=70^0
(d) Sides AB = 2.5cm, BC = 4.5 cm, CA = 3.5 cm, PQ = 5 cm, QR = 9 cm, RP = 7 cm

Q.38. A circle touches the side BC of triangle ABC at P. Side AB and AC are produced to touch the circle at points Q and R respectively. The length of AQ is:
NTPC CBT - I 07/01/2021 (Morning)
(a) $\frac{1}{2}$(BC + CA + AB)
(b) $\frac{1}{2}$(2BC + 2CA + 2AB)
(c) $\frac{1}{3}$(BC+ CA + AB)
(d) $\frac{1}{4}$ (BC + CA + AB)

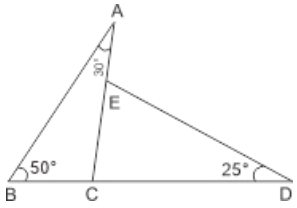
Q.39. In ΔABC, ∠A= 90^0, AB= 6cm, AC = 8cm. If AD is perpendicular to BC, the AD Is equal to
NTPC CBT - I 07/01/2021 (Evening)
(a) 4.6 cm (b) 4.4 cm
(c) 4.8 cm (d) 3.8 cm

Q.40. Line ABC is a tangent to a circle at B. PQ || AC and ∠QBC = 70°. ∠PBQ is =?



NTPC CBT - I 09/01/2021 (Evening)
(a) 20° (b) 70° (c) 40° (d) 110°

Q.41. In the given diagram, if ∠BAC = 30° , ∠ABC = 50° and ∠CDE = 25° , then ∠AED is equal to:



NTPC CBT - I 09/01/2021 (Evening)
(a) 105° (b) 115° (c) 75° (d) 95°

Q.42. a,b,c are the sides of a right triangle with c as hypotenuse. The radius r of the circle which touches the three sides of the triangle is:
NTPC CBT - I 10/01/2021 (Evening)
(a) r = $\frac{(a-b-c)}{2}$ (b) r = $\frac{(a+b-c)}{2}$
(c) r = $\frac{(a-b+c)}{2}$ (d) r = $\frac{(a+b+c)}{2}$

Q.43. If the radii of two circles are 4.5 cm and 3.5 cm, and the length of the transverse common tangent is 6 cm, then the distance between the two centers will be:
NTPC CBT - I 12/01/2021 (Morning)
(a) 8 cm (b) 10 cm (c) 12 cm (d) 9 cm

Q.44. The sides of a parallelogram are 3x + 2 and 5x +4. It has a perimeter of 44 cm and an area of 64 cm². The value of the acute angle between its sides in degrees is:
NTPC CBT - I 13/01/2021 (Morning)
(a) between 30° and 60°
(b) between 60° and 75°
(c) less than 30°
(d) greater than 75°

Q.45. If a tangent to a circle from a point P meets the circle at A with AP = 15cm. Given that the radius of the circle is 8 cm, find the distance of P from the centre of the circle.
NTPC CBT - I 21/01/2021 (Evening)
(a) 20 cm (b) 17 cm (c) 12 cm (d) 15 cm

Q.46. A square is inscribed in a circle which is inscribed in an equilateral triangle. If one side of a triangle is x, then the area of the square.
NTPC CBT - I 01/02/2021 (Evening)
(a) $\frac{1}{9}x^2$ (b) $\frac{1}{2}x^2$ (c) $\frac{1}{3}x^2$ (d) $\frac{1}{6}x^2$

Q.47. In a circle, two chords of length x and y subtend the angles of 60° and 90° at the center respectively. Which of the following is correct in this scenario?
NTPC CBT - I 02/02/2021 (Evening)
(a) y =$\sqrt{2}$x (b) y = 2x
(c) x = 2y (d) y =$\sqrt{2}$x

Q.48. What is the area of the largest square that is inscribed in a semicircle of radius 10 cm?
NTPC CBT - I 03/02/2021 (Evening)
(a) 70cm^2 (b) 90 cm^2
(c) 80 cm^2 (d) 120 cm^2

Q.49. The difference between the interior and exterior angles at a vertex of a regular polygon is 140^0. The number of sides of the polygon is:
NTPC CBT - I 08/02/2021 (Morning)
(a) 22 (b) 18 (c) 20 (d) 24

Q.50. The angle formed by the pages of a fully open book, with just few pages, it theoretically:
NTPC CBT - I 09/02/2021 (Morning)
(a) Right angle (b) Straight angle
(c) Obtuse angle (d) Acute angle

Q.51. The earth takes 24 h to rotate about its own axis. Through what angle will it turn in 5 h and 24 min?
NTPC CBT - I 09/02/2021 (Evening)
(a) 80° (b) 81° (c) 82° (d) 79°

Q.52. Find the degree measure of the angle subtended at the centre of a circle of radius 100 cm by an arc of length 22 cm.
NTPC CBT - I 11/02/2021 (Morning)
(a) 2° 36′ (b) 62° 36′
(c) 12° 36′ (d) 22° 36′

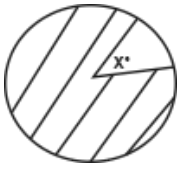
Q.53. If a, b and c are the sides of a triangle and a² + b² + c² = ab + bc + ca, then the triangle is:
NTPC CBT - I 16/02/2021 (Morning)
(a) equilateral (b) right-angled
(c) isosceles (d) obtuse-angled

Q.54. Two sides of a triangle are of lengths 4 cm and 10 cm. If the length of the third side is a cm, then ...
NTPC CBT - I 17/02/2021 (Morning)
(a) a > 5 (b) 6 < a < 12
(c) 6 < a < 14 (d) a < 6

Q.55. A boy walks along two adjacent sides of a rectangular field. If he walks along its diagonal, then he saves a distance equal to one-third of the larger side. Find the ratio of the larger side to the smaller side.
NTPC CBT - I 01/03/2021 (Evening)
(a) 2 : 5 (b) 3 : 5 (c) 12 : 3 (d) 12 : 5

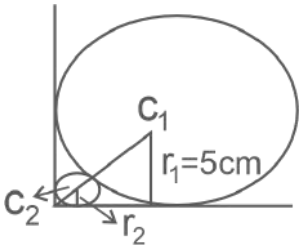
Q.56. The angle between two circles
$x^2 + y^2 - 12x - 6y + 41 = 0$ *and*
$x^2 + y^2 + kx + 6y - 59 = 0$ is 45^o.
Find the value of k.
NTPC CBT - I 09/03/2021 (Evening)
(a) ± 3 (b) ± 4 (c) 4 (d) -4

Q.57.



In the figure, if the area of the shaded sector is 70% of the area of the entire circle, then the measure of x° is _____.
NTPC CBT - I 01/04/2021 (Evening)
(a) 108° (b) 100° (c) 72° (d) 144°

Q.58. A circle having centre c_1, radius $r_1 = 5$ cm is placed against a right angle. Another smaller circle having centre c_2, radius r_2 is also placed touching the sides of the angle and the bigger circle as shown in the figure. Find the radius, r_2 in cm, of the smaller circle.

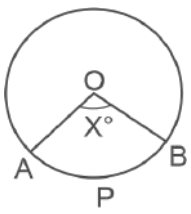


NTPC CBT - I 03/04/2021 (Morning)
(a) 3(5+2√2) (b) 5(3+2√2)
(c) 5(3-2√2) (d) 3(5-2√2)

Q.59. The perimeters of two similar triangles ΔPQR and ΔXYZ are 48 cm and 24 cm respectively. If XY = 12 cm, then PQ is
NTPC CBT - I 03/04/2021 (Evening)
(a) 8 cm (b) 18 cm (c) 24 cm (d) 12 cm

Q.60. The length of the tangent drawn from a point Q to a circle is 40 cm and the distance of point Q from the center is 41 cm, then The radius of the circle will be _____ cm.
ALP Tier II 21/01/2019 (Afternoon)
(a) 8 (b) 7 (c) 9 (d) 10

Q.61. In figure 'O' is the center of a circle. The area of the section OAPB is $\frac{5}{18}$ of the area of the circle. Find x.



ALP Tier - I 31/08/2018 (Evening)
(a) 115 degrees (b) 125 degrees
(c) 100 degrees (d) 120 degrees

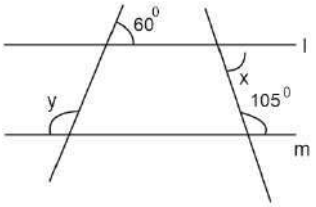
Practice Questions

RRC Group D

(17/08/2022 to 11/10/2022)

Q.62. In △ ABC if ∠A = 40° and ∠B = 70°, find the measure of exterior angle A.
Group D 17/08/2022 (Morning)
(a) 30° (b) 110° (c) 140° (d) 70°

Q.63. In the adjoining figure line l is parallel to m. What is the value of 2x + y ?



Group D 17/08/2022 (Evening)
(a) 320° (b) 270° (c) 150° (d) 225°

Q.64. If two parallel lines are intersected by a transversal, then which of the options below is not necessarily correct ?
Group D 18/08/2022 (Morning)
(a) A pair of vertically opposite angles have the same measure.
(b) A pair of alternate interior angles have the same measure.
(c) A pair of corresponding angles have the same measure.
(d) A pair of interior angles on the same side of the transversal have the same measure.

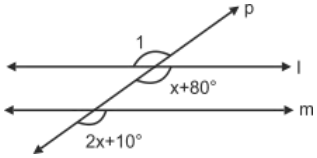
Q.65. If each interior angle of a regular polygon is 135°, then the number of sides that polygon has is :
Group D 18/08/2022 (Afternoon)
(a) 15 (b) 10 (c) 8 (d) 12

Q.66. Find the number of sides in a regular polygon if its interior angle is 160°.
Group D 18/08/2022 (Evening)
(a) 17 (b) 14 (c) 15 (d) 18

Q.67. In $\triangle ABC$ and $\triangle DEF$, ∠A = 40°, ∠B = 55°, ∠D = 55°, ∠E = 85° and m ($\overline{AB}$) = m ($\overline{FD}$). Then which of the options below is correct ?
Group D 22/08/2022 (Morning)
(a) △ABC ≅ △DFE (b) △ABC ≅ △EDF
(c) △ABC ≅ △FED (d) △ABC ≅ △FDE

Q.68. If two angles of a triangle measure 60° and 80°, respectively, then the measure of the third angle of this triangle is :
Group D 22/08/2022 (Morning)
(a) 40° (b) 70° (c) 50° (d) 60°

Q.69. In the given figure line l is parallel to m and p is the transversal. Find the measure of the angle 1.



Group D 22/08/2022 (Evening)
(a) 150° (b) 200° (c) 140° (d) 300°

Q.70. Which of the following is NOT a property of similar triangles ?
Group D 22/08/2022 (Evening)
(a) Ratio of corresponding sides = Ratio of corresponding altitudes
(b) Ratio of corresponding sides = Ratio of corresponding perimeters
(c) Ratio of corresponding sides = Ratio of corresponding medians
(d) Ratio of any two angles = Ratio of any two medians

Q.71. The measure of each interior angle of a regular polygon is 120°. How many sides does this Polygons have ?
Group D 23/08/2022 (Morning)
(a) 7 (b) 6 (c) 5 (d) 8

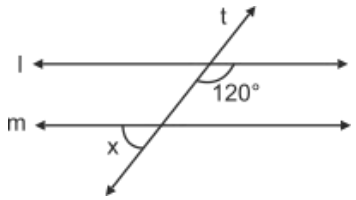
Q.72. If the Circumference of a circle is $\frac{88}{7}$ cm, then find the perimeter (in cm) of the square the length of each of whose sides is equal to the radius of the given circle. [Use $\Pi = \frac{22}{7}$]
Group D 23/08/2022 (Afternoon)
(a) 7 (b) 8 (c) 6 (d) 9

Q.73. In the context of the following, select the correct option.
Two triangles are similar if:
a) any two of their sides are equal
b) their corresponding sides are proportional
c) any two angles are equal
d) their corresponding angles are equal
Group D 23/08/2022 (Evening)
(a) both b and c (b) both b and d
(c) both a and d (d) both a and b

Q.74. Find the number of sides of a regular polygon whose sum of all interior angles is 2700°.
Group D 23/08/2022 (Evening)
(a) 17 (b) 16 (c) 15 (d) 18

Q.75. If, in the quadrilateral ABCD, the measures of the angles A, B, C, and D are in the ratio 2 : 3 : 5 : 6 , then the quadrilateral is a :
Group D 24/08/2022 (Morning)
(a) Trapezium (b) Square
(c) Kite (d) parallelogram

Q.76. If the given figure line l is parallel to m and t is the transversal. Find the measure of angle x.



Group D 24/08/2022 (Morning)
(a) 40° (b) 120° (c) 60° (d) 30°

Q.77. A parallelogram in which all sides are equal and diagonals are unequal is called _____.
Group D 24/08/2022 (Afternoon).
(a) Kite (b) rhombus
(c) square (d) rectangle

Q.78. If ΔABC is similar to ΔDEF such that 2AB = DE and BC = 8cm, then what is EF equal to?
Group D 24/08/2022 (Afternoon)
(a) 8 cm (b) 4 cm (c) 16 cm (d) 12 cm

Q.79. What is the measure of each exterior angle of a regular hexagon?
Group D 24/08/2022 (Evening)
(a) 120° (b) 30° (c) 60° (d) 45°

Q.80. Which of the following is NOT a quadrilateral?
Group D 24/08/2022 (Evening)
(a) Trapezium (b) Parallelogram
(c) Circle (d) Rhombus

Q.81. If p, q, r and s, the measures of the four angles of a quadrilateral, are in the ratio 3:5:4:6, then the value of 3p+2r is:
Group D 25/08/2022 (Morning)
(a) 330° (b) 340° (c) 360° (d) 310°

Q.82. A pair of parallel lines is intersected by a transversal such that ∠1 and ∠2 form a pair of interior angles on the same side of the transversal. If m∠1 = 35°, what is the measure of ∠2 ?
Group D 25/08/2022 (Morning)
(a) 35° (b) 55° (c) 65° (d) 145°

Q.83. The angles of a quadrilateral are in the ratio 2 : 5 : 7 : 10. Find the difference between the greatest and the smallest angles of the quadrilateral.
Group D 25/08/2022 (Afternoon)
(a) 120° (b) 50° (c) 60° (d) 180°

Q.84. In triangle ABC , AB = 3m , BC = 4m , and AC = 5 m. In triangle PRQ, PR = 4m , PQ = 5m , and RQ = 3m. Which of the following is a correct order of congruency ?
Group D 25/08/2022 (Evening)
(a) △BAC congruent to △RPQ
(b) △CBA congruent to △RPQ
(c) △ABC congruent to △RPQ
(d) △BCA congruent to △RPQ

Q.85. In △PQR , ∠PQR = 90º , m$(\overline{PQ}) = 3\ cm\ and\ m(\overline{PR}) = 6\ cm.$ What is the measure of ∠PRQ ?
Group D 25/08/2022 (Evening)
(a) 60º (b) 45º (c) 70º (d) 30º

Q.86. △ABC is similar to △FED and AB = x cm, BC = x+2 cm, EF = 12 cm, and ED = 18 cm. The value of x is _____.
Group D 26/08/2022 (Morning)
(a) 4 cm (b) - 2 cm (c) 2 cm (d) - 4 cm

Q.87. In triangles ABC and PQR, AB = AC , ∠C = ∠P and ∠B = ∠Q . So both the triangles _____.
Group D 26/08/2022 (Afternoon)
(a) are isosceles but not congruent.
(b) are congruent but not isosceles.
(c) are neither congruent nor isosceles.
(d) are isosceles and congruent.

Q.88. Find the measure of each exterior angle of a regular octagon.
Group D 26/08/2022 (Evening)
(a) 45° (b) 135° (c) 60° (d) 120°

Q.89. Which of the following is true?
(a) Every trapezium is a parallelogram.
(b) Every parallelogram is a square.
(c) Every rectangle is a square.
(d) Every square is a rhombus.
Group D 26/08/2022 (Evening)
(a) only a (b) d only
(c) both a and b (d) c only

Q.90. The internal bisectors of ∠B and ∠C of △ABC meet at D. If ∠A = 75°, the ∠BDC is :
Group D 29/08/2022 (Morning)
(a) 112.5° (b) 102.5° (c) 127.5° (d) 105.5°

Q.91. Which of the following is true for a square ?
a) All angles equal
b) All sides parallel
c) Diagonals equal
d) All sides equal
Group D 29/08/2022 (Morning)
(a) a, b (b) a, c, d (c) a, b, c (d) b, c, d

Q.92. If the opposite angles of a cyclic quadrilateral are in the ratio 3 : 7, then the measure of the bigger angle among the two is :
Group D 29/08/2022 (Morning)
(a) 140° (b) 126° (c) 70° (d) 105°

Q.93. Find the circumference of a circle that circumscribes a square of side 7 cm.
(use $\pi = \frac{22}{7}$)
Group D 29/08/2022 (Afternoon)
(a) $44\sqrt{2}$ cm (b) 22 cm
(c) 44 cm (d) $22\sqrt{2}$ cm

Q.94. If a regular polygon has 65 diagonals, then the sum of its interior angles is:
Group D 29/08/2022 (Evening)
(a) 1800° (b) 1620° (c) 1980° (d) 1440°

Q.95. If one angle of a triangle is equal to the sum of the other two angles, then the triangle is :
Group D 29/08/2022 (Evening)
(a) an obtuse angle triangle
(b) an equilateral triangle
(c) an isosceles triangle
(d) a right-angle triangle

Q.96. The point of intersection of the medians of a triangle is called :
Group D 30/08/2022 (Morning)
(a) Circumcentre (b) Orthocentre
(c) Incentre (d) Centroid

Q.97. A pair of parallel lines is intersected by a transversal such that ∠1 and ∠2 form a pair of alternate interior angles. If m ∠1 = 35°, what is the measure of ∠2 ?
Group D 30/08/2022 (Afternoon)
(a) 35° (b) 145° (c) 55° (d) 65°

Q.98. If the ratio of two interior angles on the same side of a transversal line intersecting the two parallel lines is 3 : 7 , then what is the positive difference between the measures of these two interior angles ?
Group D 30/08/2022 (Afternoon)
(a) 54° (b) 80 (c) 72° (d) 64°

Q.99. In a parallelogram PQRS, the bisectors of consecutive angles of P and Q intersect at T. What is the measure of ∠PTQ ?
Group D 30/08/2022 (Evening)
(a) 80° (b) 90° (c) 70° (d) 50°

Q.100. In triangle ABC, if the angles are in the ratio 4 : 3 : 5, find the angles.
Group D 01/09/2022 (Morning)
(a) 20°, 15°, 25° (b) 40°, 30°, 50°
(c) 20°, 50°, 70° (d) 60°, 45°, 75°

Q.101. If an exterior angle of a regular polygon is 40°, then the number of sides in the regular polygon is :
Group - D 01/09/2022 (Evening)
(a) 10 (b) 7 (c) 9 (d) 8

Q.102. In Δ ABC, BD ⊥ AC at D and ∠DBC = 44°. E is a point on BC such that ∠CAE = 34°. What is the measure of ∠AEB ?
Group D 02/09/2022 (Morning)
(a) 78° (b) 80° (c) 56° (d) 46°

Q.103. ABCD is a quadrilateral in which AB || DC, and E and F are the mid points of the diagonals AC and BD, respectively. If AB = 28 cm, BC = 15 cm, DC = 40 cm, and AD = 9 cm, then what is the length (in cm) of EF ?
Group D 02/09/2022 (Afternoon)
(a) 9 (b) 8 (c) 12 (d) 6

Q.104. In a quadrilateral ABCD, $\angle A =$ 86° and ∠B = 72°. The bisectors of ∠C and ∠ D meet at O. What is the measure of ∠DOC ?
Group D 02/09/2022 (Evening)
(a) 69° (b) 79° (c) 91° (d) 101°

Q.105. AB is parallel to CD. A transversal PQ intersects AB and CD at E and F, respectively, and ∠PEB = 78°. G is a point between AB and CD such that ∠BEG = 18° and ∠GFE = 30°. What is the measure of ∠EGF ?
Group D 02/09/2022 (Evening)
(a) 72° (b) 58° (c) 66° (d) 68°

Q.106. If the angles (3x-5)° and 80° form a pair of supplementary angles, then the value of x is :
Group - D 02/09/2022 (Morning)
(a) 35° (b) 45° (c) 50° (d) 90°

Q.107. If ABCD is a rhombus such that ∠ ACB = 40°, then ∠ADB is :
Group D 05/09/2022 (Morning)
(a) 40° (b) 50° (c) 60° (d) 45°

Q.108. The corresponding sides of two similar triangles are in the ratio of 2: 3. If the area of the smaller triangle is 48 cm², then the area of the bigger triangle is :
Group D 05/09/2022 (Morning)
(a) 106 cm² (b) 230 cm²
(c) 107 cm² (d) 108 cm²

Q.109. The lengths of the diagonals of a rhombus are 16 cm and 12 cm. The length of the side of the rhombus is :
Group D 05/09/2022 (Afternoon)
(a) 9 cm (b) 10 cm (c) 20 cm (d) 8 cm

Q.110. In a triangle ABC if ∠ABC = 90° and BA = BC, then the angles of A and C respectively are :
Group D 05/09/2022 (Afternoon)
(a) 50°, 40° (b) 45°, 45°
(c) 80°, 60° (d) 80°, 70°

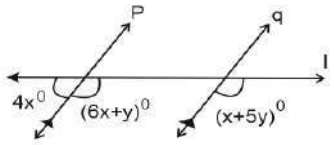
Q.111. The difference in the measures of two complementary angles is 24°. Find the measure of the greater angle.
Group D 05/09/2022 (Afternoon)
(a) 55° (b) 33° (c) 57° (d) 43°

Q.112.ABCD is a trapezium in which BC || AD and AC = CD. If ∠ABC = 98° and ∠ BAC = 32°, then what is the measure of ∠ ACD ?
Group D 05/09/2022 (Evening)
(a) 65° (b) 70° (c) 80° (d) 75°

Q.113. A quadrilateral whose sides are equal and all angles between the sides are 90° is called a :
Group D 05/09/2022 (Evening)
(a) rectangle (b) rhombus
(c) trapezium (d) square

Q.114. A straight angle is equal to _____.
Group D 06/09/2022 (Morning)
(a) 0° (b) 90° (c) 180° (d) 100°

Q.115. In the given figure, p || q and l is a transversal cutting p and q with angles as specified. The value of (5x - y) is :
Group - D 06/09/2022 (Evening)



(a) 60 (b) 40 (c) 96 (d) 116

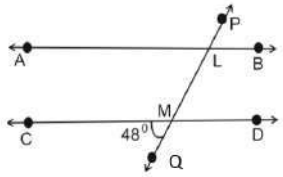
Q.116. The angles opposite to the equal sides of a triangle are _____.
Group D 06/09/2022 (Morning)
(a) unequal (b) complementary
(c) equal (d) supplementary

Q.117. If each interior angle of a regular polygon is 144° , then the number of its sides is :
Group - D 06/09/2022 (Morning)
(a) 12 (b) 14 (c) 8 (d) 10

Q.118. D and E are the mid-points of the sides AB and AC of a triangle ABC, respectively, and BC = 6 cm. If DE || BC, then find the length of DE.
Group D 06/09/2022 (Afternoon)
(a) 2.5 cm (b) 3 cm (c) 5 cm (d) 6 cm

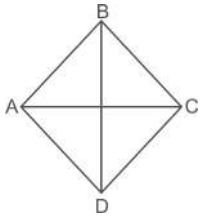
Q.119. Two parallel lines intersect at:
Group D 08/09/2022 (Afternoon)
(a) two points (b) one point
(c) three points (d) no point

Q.120. In the given figure, AB and CD are parallel lines intersected by a transversal PQ at L and M, respectively. If ∠CMQ= $48°$, then ∠PLA is :
Group D 08/09/2022 (Evening)



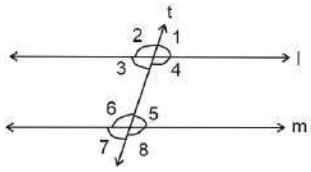
(a) 110° (b) 132° (c) 125° (d) 120°

Q.121. If ABCD is a rhombus such that ∠ACB = 50° , then ∠BDC will be :
Group D 08/09/2022 (Evening)



(a) 55° (b) 50° (c) 40° (d) 60°

Q.122. In the given figure, l || m and t is a transversal. If ∠1 and ∠2 are in the ratio 4 : 11 , the measures of the angles ∠7 and ∠8 , respectively, are :
Group D 09/09/2022 (Morning)

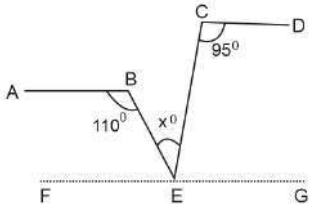


(a) 110° and 70° (b) 87° and 93°
(c) 132° and 48° (d) 65° and 115°

Q.123. In a quadrilateral ABCD, if the sum of angles ∠B and ∠D be 150° while angles∠A and ∠C are in ratio 4 : 3 , then the measure of ∠C will be :
Group D 09/09/2022 (Morning)
(a) 120° (b) 90° (c) 150° (d) 210°

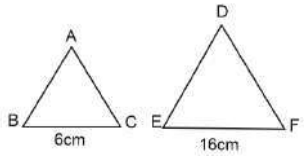
Q.124. In ΔMNO,∠N = ∠O and NO = 12 cm, MO = 10 cm and MP be the altitude , then the length of MP is :
Group D 09/09/2022 (Afternoon)
(a) 8 cm (b) 10 cm (c) 3 cm (d) 11 cm

Q.125. In the given figure, lines AB and CD are parallel to line FG. E is a point on the line FG. It is given that ∠ABE = 110°, ∠ECD = 95° and ∠BEC = x°. The value of x is :
Group D 09/09/2022 (Evening)



(a) 25° (b) 80° (c) 60° (d) 30°

Q.126. In the given figure, if ΔABC and Δ DEF are similar, then the ratio of CA to FD will be:



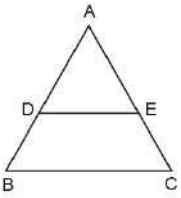
Group D 12/09/2022 (Morning)
(a) 3 : 7 (b) 5 : 7 (c) 3 : 4 (d) 3 : 8

Q.127. In quadrilateral PQRS, the bisectors of ∠R and ∠S meet at the point T (inside the quadrilateral) and ∠STR=87.5°. If the ratio of ∠P to ∠Q is 2: 3, then what is the difference between the measures of ∠Q and ∠P ?
Group D 12/09/2022 (Afternoon)
(a) 25° (b) 40° (c) 35° (d) 45°

Q.128. The hypotenuse of a right - angled triangle is 2 more than twice of one of the sides, while the third side is 13 more than half of the hypotenuse. The length of the median to the hypotenuse is :
Group D 12/09/2022 (Afternoon)
(a) 15 (b) 18 (c) 17 (d) 20

Q.129. It is given that, ΔABC ≅ ΔFDE and AB = 6 cm , ∠B = 60° and ∠A = 70° , then which of the following is true?
Group D 12/09/2022 (Evening)
(a) DE = 5 cm , ∠E = 50°
(b) DF = 6 cm , ∠E = 50°
(c) DE = 6 cm , ∠D = 40°
(d) DF = 6 cm , ∠F = 50°

Q.130.. In the given figure, in ΔABC, DE || BC , AD = 7 cm , AE = 3.5 cm and DB = 6 cm. What is the value of AC ? [Note: Diagram is not drawn to scale or measurements indicated.]



Group D 13/09/2022 (Afternoon)
(a) 3 cm (b) 4.5 cm (c) 4 cm (d) 6.5 cm

Q.131. The length of each of the two equal sides of an isosceles triangle is 5 cm each and the length of its base is 8 cm. The area (in cm²) of the triangle is :
Group D 13/09/2022 (Afternoon)
(a) 15 (b) 9 (c) 18 (d) 12

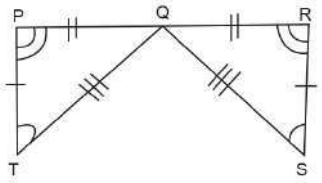
Q.132. In a triangle, if one angle measures twice the smallest angle and the third one measures three times the smallest angle, then the measure of the greatest angle is _____ .
Group D 14/09/2022 (Morning)
(a) 90° (b) 30° (c) 45° (d) 120°

Q.133. m and n are two parallel lines. If L is a transversal intersecting m and n, then the sum of the interior angles formed on the same side of l is equal to:
Group D 14/09/2022 (Afternoon)
(a) 270° (b) 360° (c) 180° (d) 90°

Q.134. If the lengths of the sides of a triangle are x+1, 7-x and 4x-2, then the value of x for which the triangle represents an isosceles triangle is_____.
Group D 14/09/2022 (Afternoon)
(a)1.8 (b) 2.4 (c) 3 (d) 1

Q.135. In an isosceles triangle, the vertex angle measures 80°. What is the measure of each of the base angles?
Group D 14/09/2022 (Evening)
(a) 50° and 50° (b) 60° and 40°
(c) 60° and 50° (d) 60° and 60°

Q.136. As per the figure given below, Δ QRS ≅ _____. [Note: Diagram is not drawn to scale or measurements indicated.]

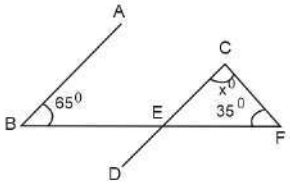


Group D 15/09/2022 (Morning)
(a) △QTP (b) △QPT
(c) △PTQ (d) △TPQ

Q.137. In a triangle PQR, ∠P = 30° and the straight line UV is drawn parallel to QR, intersecting PQ at S and PR at T. Which of the following is always true?
1) $\frac{PS}{PQ} = \frac{PT}{PR}$
2) ST = $\frac{QR}{2}$
3) The triangle PST is similar to the triangle PQR.
Group D 17/09/2022 (Morning)
(a) Only 1 and 3 (b) Only 1 and 2
(c) All of 1 , 2 and 3 (d) Only 1

Q.138. AD is the altitude of an isosceles triangle ABC in which AB = AC. Which of the following is true for AD?
Group D 17/09/2022 (Morning)
(a) AD bisects ∠A
(b) AD bisects ∠C
(c) AD does not bisect ∠A
(d) AD bisects ∠B

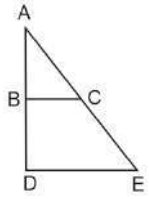
Q.139. In the given figure, AB is parallel to CD. What is the value of x° ?



Group D 17/09/2022 (Afternoon)
(a) 110° (b) 30° (c) 80° (d) 100°

Q.140. In triangle DEF, side EF is produced to G. If ∠DFG = 110° and EF = DF, then ∠DEF measures:
Group D 18/09/2022 (Morning)
(a) 40° (b) 70° (c) 55° (d) 45°

Q.141. Given that △ ABC and △ADE are similar which of the following option is necessarily true ?



Group D 18/09/2022 (Evening)
(a) $\frac{AB}{AD} = \frac{BC}{DE}$ (b) $\frac{EC}{AC} = \frac{AD}{DE}$
(c) $\frac{BC}{AD} = \frac{CE}{DE}$ (d) $\frac{BC}{BD} = \frac{AB}{AC}$

Q.142. Two adjacent angles of a parallelogram are such that one is two-thirds the other. Find the measure of the smaller angle.
Group D 19/09/2022 (Morning)
(a) 18° (b) 72° (c) 36° (d) 108°

Q.143. If one angle of a quadrilateral measures 120° and its remaining three angles are equal in measure to one another, then the measure of each of these three remaining angles is equal to_____.
Group D 19/09/2022 (Evening)
(a) 80° (b) 110° (c) 60° (d) 90°

Q.144. The measures of three angles of a quadrilateral are given as 90°, 96° and 88°. The measure of its fourth angle is_____.
Group D 20/09/2022 (Morning)
(a) 96° (b) 86° (c) 82° (d) 88°

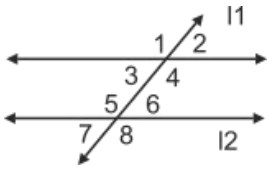
Q.145. If the area of an equilateral triangle is $25\sqrt{3}$ cm², then the length (in cm) of each side of this equilateral triangle is_____
Group D 20/09/2022 (Evening)
(a) 10 (b) $10\sqrt{3}$ (c) 8 (d) $5\sqrt{2}$

Q.146. G is the centroid of ΔABC. AD is a median of ΔABC intersecting BC at D. What is the ratio of the lengths of AG and GD ?
Group D 22/09/2022 (Morning)
(a) 3:1 (b) 2:1 (c) 1:2 (d) 1:3

Q.147. Three angles of ΔABC are in the ratio 3 : 4 : 5, taken in order. If side AB is extended to X, what is the measure of exterior angle ∠CBX ?
Group D 26/09/2022 (Morning)
(a) 100° (b) 80° (c) 120° (d) 60°

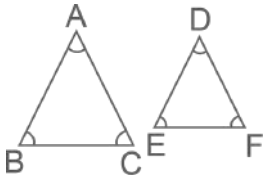
Q.148. In the given figure, l_1 ‖ l_2 and p is their transversal with angle 4=5x+35 and

angle 7 = 45°. Find the value of x.



Group D 26/09/2022 (Afternoon)
(a) 40° (b) 10° (c) 20° (d) 45°

Q.149. In the given figure, ΔABC is similar to ΔDEF ; if AB = 6.5 cm , DE = 3.9 cm , and BC = 5.15 cm, find EF.



Group D 26/09/2022 (Evening)
(a) 3.90 cm (b) 3.09 cm
(c) 3.00 cm (d) 4.12 cm

Q.150. If in a parallelogram ABCD , E and F are points on the diagonal AC such that $\overline{AE} = \overline{FC}$, then quadrilateral BEDF is a
Group D 28/09/2022 (Morning)
(a) trapezium, but not a parallelogram
(b) rectangle
(c) square
(d) parallelogram

Q.151. What is the measure of each interior angle of a regular octagon?
Group D 28/09/2022 (Morning)
(a) 140° (b) 130° (c) 135° (d) 125°

Q.152. If the measures of the angles of a quadrilateral taken in order are in the ratio 1:3:1:3, then the quadrilateral is a:
Group D 28/09/2022 (Evening)
(a) trapezium, but not a parallelogram
(b) rectangle
(c) parallelogram
(d) square

Q.153. In Δ ABC and ΔDEF, if AB = DE, AC = EF and BC = DF , then which of the following is true based on SSS theorem ?
Group D 29/09/2022 (Morning)
(a) ΔABC ≅ Δ EDF (b) ΔABC ≅ ΔFDE
(c) ΔABC ≅ ΔDEF (d) ΔABC ≅ ΔEFD

Q.154. The length of each side of a rhombus is 20 cm, and the length of one of its diagonal is 30 cm. Find the length (in cm) of its other diagonal.
Group D 29/09/2022 (Morning)
(a) $\sqrt{175}$ (b) $10\sqrt{7}$ (c) $\sqrt{7}$ (d) $6\sqrt{7}$

Q.155. Straight line FB is parallel to straight line GD. A is a point on straight line FB and C is a point on straight line GD. E is a point between FB and GD such that ∠ BAE = 118° and ∠DCE = 112°.

What is the measure of $\frac{1}{2}$∠AEC ?
Group D 29/09/2022 (Afternoon)
(a) 75° (b) 65° (c) 72° (d) 62°

Q.156. ΔABC ~ ΔQPR and (area of ΔABC): (area of Δ PQR) 3 : 2 . If AB = 12 cm , BC = 10 cm, and AC = 9 cm , then the length of QR (in cm) is :
Group D 30/09/2022 (Afternoon)
(a) $8\sqrt{3}$ (b) $3\sqrt{6}$ (c) $\frac{10}{\sqrt{3}}$ (d) $\frac{20}{\sqrt{3}}$

Q.157. In ΔABC , m($\overline{AB}$) = m($\overline{AC}$) , and m∠BAC = 30°. If the side BC of ΔABC is extended to D, then find m∠ACD.
Group D 30/09/2022 (Afternoon)
(a) 50° (b) 105° (c) 75° (d) 120°

Q.158. In a parallelogram ABCD, if m∠A = (3x + 16)° and m∠B = (2x + 24)°, then find m∠C.
Group D 30/09/2022 (Evening)
(a) 56° (b) 28° (c) 100° (d) 110°

Q.159. In Δ ABC, $\overline{AD}$ bisects ∠A and D is a point on $\overline{BC}$. If m ($\overline{AC}$) = 4.2 cm, m ($\overline{BD}$) = 4 cm and m ($\overline{BC}$) = 7 cm, then find m ($\overline{AB}$).
Group D 06/10/2022 (Morning)
(a) 5.2 cm(b) 4.2 cm(c) 4.8 cm (d) 5.6 cm

Q.160. MNOP is a quadrilateral in which each of its angles is a right angle. Side MN equals side PO and side MP equals side NO and its both diagonals do not intersect at 90°. What type of quadrilateral is MNOP ?
Group D 06/10/2022 (Afternoon)
(a) Kite (b) Rectangle
(c) Square (d) Rhombus

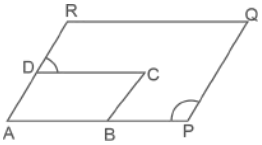
Q.161. Straight lines l and m are parallel to each other. Points A and B lie on the line l, points C and D lie on the line m, and E is a point that lies between the straight lines l and m, all in such a manner that m∠EAB = 50° and m∠ECD = 70°. Find the measure of ∠AEC if points A and C lie on the same side of point E.
Group D 07/10/2022 (Morning)
(a) 60° (b) 70° (c) 100° (d) 120°

Q.162. The perimeter of a regular pentagon whose each side is 2a cm long is :
Group D 07/10/2022 (Morning)
(a) $10a^2$ cm (b) 5a cm
(c) $5a^2$ cm (d) 10a cm

Q.163. Two sides of a triangular field are 41 m and 28 m. If its perimeter is 84 m, then what is the length of the smallest altitude of the triangle? [Give your answer correct to two places of decimal.]
Group D 07/10/2022 (Morning)
(a) 6.12 m (b) 7.15 m
(c) 7.12 m (d) 6.15 m

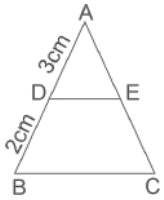
Q.164. If ΔABC and ΔDEF are similar and AB = 6 cm, DE = 8 cm , EF = 10 cm and FD = 14 cm , then the perimeter of ΔABC is :
Group D 07/10/2022 (Evening)
(a) 20 cm (b) 24 cm (c) 14 cm (d) 16 cm

Q.165. In the given figure, ABCD and APQR are two parallelograms. If ∠APQ = 100° , find ∠CDR.



Group D 11/10/2022 (Evening)
(a) 40° (b) 80° (c) 100° (d) 36°

Q.166. In the given figure, triangle ABC is similar to triangle ADE. If the area of triangle ADE = 18 cm² , then the area of triangle ABC is :



Group D 11/10/2022 (Evening)
(a) 50cm² (b) 45cm² (c) 55cm² (d) 90cm²

RRB NTPC CBT - 2
(09/05/2022 to 17/06/2022)

Q.167. AB and CD are parallel tangents to a circle with centre O. Points P and Q are on AB and CD, respectively, such that PQ touches the circle at R. Find the measure of ∠POQ .
Level 6 (09/05/2022) Shift 1
(a) 85° (b) 90° (c) 80° (d) 100°

Q.168. PQRS is a cyclic quadrilateral in a circle with centre O. ∠PQR and ∠PSR are in the ratio 11 : 7. If PQ = QR, then find ∠OPQ?
Level 6 (09/05/2022) Shift 2
(a) 55° (b) 62° (c) 52° (d) 56°

Q.169. Two chords AB and CD of a circle interest at a point F outside the circle If AF = 12 cm, BF = 4cm and CF = 16 cm, find the length of CD.
Level 5 (12/06/2022) Shift 1
(a) 13 cm (b) 12 cm(c) 11 cm (d) 10 cm

Q.170. ABCD is a cyclic quadrilateral, AB is a diameter of the circle. If ∠ACD = 35°, find the value of ∠BAD.
Level 5 (12/06/2022) Shift 2
(a) 70° (b) 55° (c) 45° (d) 60°

Q.171. ΔABC is an equilateral triangle with side 12 cm. CD is the bisector of ∠C which meets AB at D and E is the mid-point of CD. What is the length of BE?
Level 2 (13/06/2022) Shift 2
(a) $3\sqrt{6}$ cm (b) 8 cm
(c) $3\sqrt{7}$ cm (d) $6\sqrt{2}$ cm

Q.172. In Δ ABC, The bisectors of ∠B and ∠C intersect at P inside the triangle. If ∠BPC = 128°, then what is the measure of ∠A?
Level 3 (14/06/2022) Shift 1
(a) 52° (b) 78° (c) 76° (d) 82°

Q.173. Two chords AB and CD of a circle intersect at point F inside the circle. If AF = 4 cm, BF = 6 cm and CF = 3 cm, then find the length of CD.
Level 3 (14/06/2022) Shift 2
(a) 8 cm (b) 11 cm (c) 16 cm (d) 12 cm

Q.174. The bisector of ∠QPR of △PQR meets the side QR at S. If PQ = 12 cm, PR = 15 cm and QR = 18 cm, then the length of SR is:-
Level 3 (14/06/2022) Shift 2
(a) 10 cm (b) 12 cm (c) 8 cm (d) 13 cm

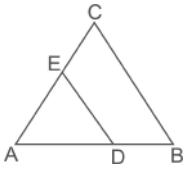
Q.175. The sides AB, BC, CD and DA of a quadrilateral ABCD touch a circle at P,Q,R and S, respectively . if the AB =16 cm, DS = 10 cm and RC=3 cm, then find the perimeter of the quadrilateral ABCD (in cm).
Level 5 (15/06/2022) Shift 3
(a) 56 (b) 60 (c) 58 (d) 55

Q.176. The altitude of an equilateral triangle is 12 cm. What is the perimeter of the triangle?
Level 2 (16/06/2022) Shift 1
(a) $30\sqrt{3}$ cm (b) $24\sqrt{3}$ cm
(c) 42 cm (d) $18\sqrt{3}$ cm

Q.177. ΔRST is an obtuse isosceles triangle with m∠R = 16° and m($\overline{TR}$) > m($\overline{ST}$). What is the measure of ∠S?
Level 2 (16/06/2022) Shift 1
(a) 164° (b) 144° (c) 148° (d) 16°

Q.178. ABCD is a cyclic quadrilateral whose side AB is a diameter of the circle through A,B,C and D. if ∠ADC=129°, then what is the measure of ∠BAC?
Level 2 (16/06/2022) Shift 2
(a) 39° (b) 49° (c) 41° (d) 51°

Q.179. In the given figure, DE II BC. if AD = x, DB = x - 2, AE = x + 2 and EC = x - 1, then find the value of x.



Level 3 (17/06/2022) Shift 1
(a) 3 (b) 4 (c) 5 (d) 2

Q.180. ABC is an isosceles triangle in which AB = AC and ∠BAC = 50°. Side BC is extended to D. Find the measure of ∠ACD.
Level 3 (17/06/2022) Shift 1
(a) 100° (b) 130° (c) 110° (d) 115°

Q.181. IJK is an isosceles triangle in which IJ = IK. The value of ∠IJK is what percentage less than $120^{\bullet}$, if angle ∠JIK= $60^{\bullet}$.
Level 3 (17/06/2022) Shift 3
(a) 52 % (b) 55 % (c) 54 % (d) 50%

RRB NTPC CBT - 1 (28/12/2020 to 31/07/2021)

Q.182. The angles of a triangle are 2x°, (3x° - 8°) and (5x° -12°). The greatest angle of the triangle is:
RRB NTPC 28/12/2020 (Morning)
(a) 112^0 (b) 40^0 (c) 118^0 (d) 88^0

Q.183. The adjacent angles of a rhombus are in the ratio of 3 : 6. The smallest angle of the rhombus is:
RRB NTPC 28/12/2020 (Morning)
(a) 40^0 (b) 120^0 (c) 80^0 (d) 60^0

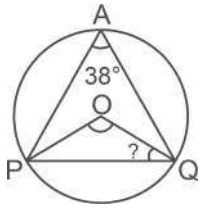
Q.184. The radius of the circumcircle of an equilateral triangle of $\sqrt{3}$ unit side, is:
RRB NTPC 28/12/2020 (Evening)
(a) $\frac{1}{4}$ unit (b) $\frac{2}{3}$ unit
(c) $\frac{1}{2}$ unit (d) 1 unit

Q.185. ABCD is a parallelogram. Side BC is produced to E such that BC = CE. Join AE which intersects the side CD at P. The areas of triangle ABE is
RRB NTPC 28/12/2020 (Evening)
(a) = to $\frac{1}{3}$of the area of parallelogram ABCD
(b) less than the area of parallelogram ABCD
(c) = to the area of parallelogram ABCD
(d) = to $\frac{1}{2}$ of the area of parallelogram ABCD

Q.186. ABCD is a square. X is the midpoint of AB. Y is a point on BC such that BY = $\frac{1}{3}$ BC. If the area of $\Delta BXY$is equal to 300 cm², find length of diagonal AC.
RRB NTPC 29/12/2020 (Morning)
(a) $50\sqrt{2}$ (b) $60\sqrt{2}$ (c) 60 (d) 50

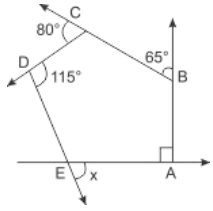
Q.187. The side of an equilateral triangle ABC is 28 cm. Find the side of another equilateral triangle PQR whose area is 16 times the area of triangle ABC.
RRB NTPC 29/12/2020 (Morning)
(a) 56 cm (b) 102 cm
(c) 112 cm (d) 122 cm

Q.188. In the given figure, PO and OQ are the radius of the circumcircle of Δ APQ
If ∠PAQ = 38° then ∠ PQO will be



RRB NTPC 29/12/2020 (Evening)
(a) 112° (b) 76° (c) 52° (d) 104°

Q.189. In the given figure, value of X is
RRB NTPC 30/12/2020 (Morning)



(a) 70° (b) 60° (c) 65° (d) 55°

Q.190. Triangle ABC is an isosceles triangle in which $\angle C = 90^0$. If AC = 8 cm, find AB.
RRB NTPC 30/12/2020 (Evening)
(a) 8 cm (b) 6 cm (c) 10 cm (d) 8 $\sqrt{2}$cm

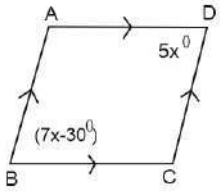
Q.191. PQRS is a cyclic trapezium where PQ is parallel to RS and PQ is the diameter. If ∠QPR = 40°, then the ∠PSR is equal to
RRB NTPC 04/01/2021 (Morning)
(a) 130° (b) 120° (c) 110° (d)140°

Q.192. ABC is a right-angled triangle. A circle is inscribed in it. The length of two sides containing the right angle are 10 cm and 24 cm. Find the radius of the circle.
RRB NTPC 04/01/2021 (Evening)
(a) 5 cm (b) 3 cm (c) 2 cm (d) 4 cm

Q.193. In the parallelogram ABCD, AL and CM are perpendicular to CD and AD respectively. AL = 20 cm. CD = 18 cm and CM = 15 cm. The perimeter of the parallelogram is:

RRB NTPC 07/01/2021 (Morning)
(a) 80 cm (b) 84 cm (c) 76 cm (d) 64 cm

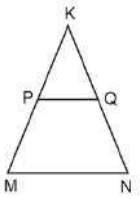
Q.194. Looking at the following figure, where angle B and D are $(7x - 30)^0$ and $5x^0$ respectively, we can say that the value of x is:



RRB NTPC 07/01/2021 (Evening)
(a) 75° (b) 15° (c) 65° (d) 105°

Q.195. The sides of a triangle are in the ratio 3 : 4 : 5 the triangle is:
RRB NTPC 07/01/2021 (Evening)
(a) right angled
(b) obtuse angled
(c) acute angled
(d) either acute angled or right angled

Q.196. In the given ΔKMN, PQ is $parallel$ to MN. If $\frac{KP}{PM} = \frac{4}{13}$ and $KN = 20.4$ cm, $find$ KQ



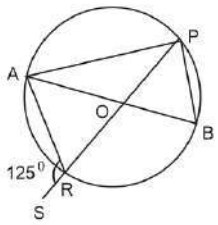
RRB NTPC 08/01/2021 (Morning)
(a) 8.2 cm (b) 4.8 cm
(c) 5.1 cm (d) 3.6 cm

Q.197. From an external point P, tangents PA and PB are drawn to a circle with centre O. If ∠PAB = 55°, find ∠AOB.
RRB NTPC 08/01/2021 (Evening)
(a) 125° (b) 35° (c) 110° (d) 100°

Q.198. Find the area of a rhombus whose side is 10 cm and the longest diagonal is 16 cm.
RRB NTPC 08/01/2021 (Evening)
(a) 86 cm^2 (b) 88 cm^2
(c) 96 cm^2 (d) 94 cm

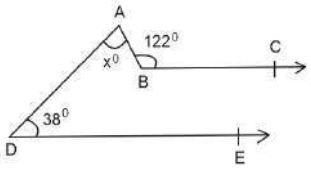
Q.199. The perimeter of a right triangle is 60 cm and its hypotenuse is 26 cm. Find the area of the triangle.
RRB NTPC 08/01/2021 (Evening)
(a) 160 cm^2 (b) 180 cm^2
(c) 120 cm^2 (d) 240 cm^2

Q.200. In the figure, O is the centre of the circle. If ∠ARS = 125^o. Then find the measure of ∠PAB.



RRB NTPC 09/01/2021 (Morning)
(a) 145^o (b) 35^o (c) 125^o (d) 55^o

Q.201. In the given figure, BC II DE, find the value of x.



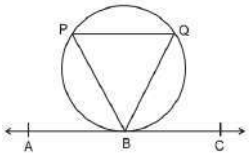
RRB NTPC 09/01/2021 (Morning)
(a) 84 (b) 38 (c) 142 (d) 20

Q.202. The length of a rectangle is 2 m less than thrice its breadth. If its perimeter is 28 m. Find its breadth.
RRB NTPC 09/01/2021 (Morning)
(a) 4 m (b) 7.5 m (c) 10 m (d) 6 m

Q.203. The base of a right-angled triangle is 12 cm and the difference between the other two sides is 6 cm. What will be the perimeter of the triangle?
RRB NTPC 09/01/2021 (Evening)
(a) 36 cm (b) 30 cm (c) 54 cm (d) 18 cm

Q.204. Length of the three sides of △ ABC are 6 cm, 4 cm and 9 cm. Another △ DEF with one side equal to 36 cm is similar to △ ABC. What is the greatest possible perimeter of △ DEF?
RRB NTPC 10/01/2021 (Morning)
(a) 420 cm (b) 171 cm
(c) 76 cm (d) 114 cm

Q.205. Line ABC is a tangent to a circle at B. If BP = BQ and ∠QBC = 72° then ∠PBQ is

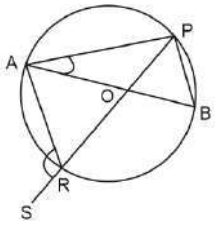


RRB NTPC 10/01/2021 (Morning)
(a) 70° (b) 108° (c) 72° (d) 36°

Q.206. PT is tangent drawn from P, given outside the circle with centre O touching the circle at Q . If PQ= 30 cm and the diameter of the circle is 32 cm, then what is the length of OP?
RRB NTPC 10/01/2021 (Evening)
(a) 32 cm (b) 34 cm (c) 36 cm (d) 38 cm

Q.207. The base BC of triangle ABC is divided at D such that BD= half of DC. The area of triangle ABC is ____ times the area of triangle ADC.
RRB NTPC 10/01/2021 (Evening)
(a) 2 (b) $\frac{3}{2}$ (c) 4 (d) 3

Q.208. In the given figure O is the centre of the circle. If $\angle PAB = 35°$, then find ∠ ARS.



RRB NTPC 11/01/2021 (Evening)
(a) 125° (b) 55° (c) 65° (d) 115°

Q.209. In ΔABC, $\angle BAC = 60^0$ and O is a point inside ΔABC. If $\angle OBC$ is two times $\angle OBA$ and $\angle OCB$ is two times $\angle OCA$. then what will be the measure of $\angle BOC$?
RRB NTPC 12/01/2021 (Morning)
(a) 60^0 (b) 120^0 (c) 80^0 (d) 100^0

Q.210. PQ is the diameter of a circle whose centre is O. If a point R lies on the circle and $\angle RPO = 39^0$ then what will be the measure of $\angle RQP$?
RRB NTPC 12/01/2021 (Morning)
(a) 51^0 (b) 125^0 (c) 129^0 (d) 151^0

Q.211. In ΔPQR. QR is extended up to S, so that RS = RP. If ∠RPQ = $55^0$and ∠PRS = 110^0,then find the measure of ∠PQS.
RRB NTPC 12/01/2021 (Evening)
(a) 55^0 (b) 65° (c) 15° (d) 75°

Q.212. The length of a tangent drawn to a circle of radius 4 cm from a point 5 cm away from the center of the circle is:
RRB NTPC 12/01/2021 (Evening)
(a) $5\sqrt{3}$cm (b) 5 cm (c) $3\sqrt{3}$cm (d) 3 cm

Q.213. In a ΔXYZ, XY = 12 cm and YZ= 18 cm. XW, the angle bisector of YXZ, meets YZ at W , such that YW : WZ is 4 : 5. Find the length of the third side of the triangle.
RRB NTPC 17/01/2021 (Morning)
(a) 12 cm (b) 15 cm (c) 14 cm (d) 18 cm

Q.214. In ΔPQR, QR is extended up to S so that RS = RP. If ∠PRQ = 70° and ∠QPS = 110° then find the measure of ∠PQS.
RRB NTPC 17/01/2021 (Morning)
(a) 50° (b) 35° (c) 65° (d) 55°

Q.215. ABC is an equilateral triangle and O is a circumcentre. If the side of triangle is 6 cm , then the ∠BOC is:
RRB NTPC 17/01/2021 (Evening)
(a) 30^o (b) 60^o (c) 36^o (d) 120^o

Q.216. If ΔABC is right-angled at C, CD ⊥ AB and ∠A = 55° then, ∠ACD =?
RRB NTPC 21/01/2021 (Evening)
(a) 35° (b) 55° (c) 60° (d) 45°

Q.217. In ΔABC, DE ∥ BC in such a way that A-D-B and A - E - C. If m∠ACB = 40°, then m∠DAE + m∠ADE =_____.
RRB NTPC 21/01/2021 (Evening)
(a) 240° (b) 120° (c) 230° (d) 140°

Q.218. If SA and SB are tangents to a circle from an outside point S, such that SA = 12 cm and angle ∠ASB = 60^o. What will the length of chord AB be ?
RRB NTPC 22/01/2021 (Morning)
(a) 12 cm (b) 3 cm (c) 6cm (d) 24 cm

Q.219. The adjacent sides of a parallelogram are 4a and 3a. If the angle between them is 60° , then one of the diagonals of the parallelogram will be:
RRB NTPC 23/01/2021 (Evening)
(a) $\sqrt{13}a$ (b) $2\sqrt{3}a$ (c) $5\sqrt{3}a$ (d) $3\sqrt{3a}$

Q.220. The ratio of the numbers of sides of two regular polygons is 1 : 2. If each interior angle of the first polygon is 140°, then the measure of each interior angle of the second polygon is ?
RRB NTPC 25/01/2021 (Evening)
(a) 150° (b) 140° (c) 170° (d) 160°

Q.221. If one angle of a parallelogram is 18^0 less than twice the smallest angle of the same parallelogram, then the largest angle of the parallelogram is:
RRB NTPC 28/01/2021 (Evening)
(a) 114^o (b) 120^o (c) 108^o (d) 104^o

Q.222. If the difference between the exterior and the interior angles of a regular polygon is 60^0, With the interior angle being greater than the corresponding exterior angle, then find the number of sides of the polygon.
RRB NTPC 29/01/2021 (Morning)
(a) 7 (b) 5 (c) 6 (d) 8

Q.223. If the angles of a quadrilateral are in the ratio of 4 : 9 : 11 : 12, then the largest of these angles is:
RRB NTPC 29/01/2021 (Evening)
(a) 168° (b) 72° (c) 166° (d) 120°

Q.224. If the difference between the interior and exterior angles of a polygon is 36°, then find the number of sides in the polygon.
RRB NTPC 29/01/2021 (Evening)
(a) 5 (b) 7 (c) 8 (d) 6

Q.225. In triangle ABC, bisector of ∠ABC and ∠ACB meet at O. if ∠BAC = 60° then find the measure of ∠BOC.
RRB NTPC 30/01/2021 (Morning)
(a) 120° (b) 160° (c) 80° (d) 130°

Q.226. In a triangle the ratio of angles is 2 : 3 : 4. Find the difference between the greatest and the smallest angle.
RRB NTPC 30/01/2021 (Morning)
(a) 20° (b) 40° (c) 60° (d) 0°

Q.227. The Perimeter of an equilateral triangle is $36\sqrt{3}$ m. Find the height (in metres).
RRB NTPC 30/01/2021 (Evening)
(a) 12 (b) 14 (c) 16 (d) 18

Q.228. The lengths of the three medians of a triangle are 3 cm, 6 cm and 5 cm. The area of the triangle is?
RRB NTPC 30/01/2021 (Evening)
(a) $\frac{\sqrt{405}}{3}\ cm^2$ (b) $\frac{\sqrt{345}}{3}cm^2$
(c) $\frac{4}{3}\sqrt{56}\ cm^2$ (d) $\frac{\sqrt{255}}{3}cm^2$

Q.229. The lengths of two sides of a triangle are 7 cm and 8 cm respectively and the measure of the angles included between these two sided is $60^{0.}$. The length (in cm) of the third si de of the triangle is:
RRB NTPC 30/01/2021 (Evening)
(a) $2\sqrt{14}$ (b) 7.5 (c) 9 (d) $\sqrt{57}$

Q.230. If a tangent to a circle from a point P meets the circle at A with AP = 15cm. Given that the radius of the circle is 8 cm, find the distance of P from the centre of the circle.
RRB NTPC 30/01/2021 (Evening)
(a) 20 cm (b) 17 cm (c) 12 cm (d) 15 cm

Q.231. Write a Pythagorean triplet whose smallest member is 8.
RRB NTPC 30/01/2021 (Evening)
(a) 8, 18, 28 (b) 8, 15, 17
(c) 8, 15, 19 (d) 8, 10, 12

Q.232. A rectangle having 34 cm and 18 cm as its dimensions was reconstructed to make a rhombus having the same perimeter as that of the rectangle and 120° as one of its angles. The area of the rhombus in cm^2 was ___.
RRB NTPC 31/01/2021 (Morning)
(a) $338\sqrt{3}$ (b) $\frac{338\sqrt{3}}{3}$
(c) $\frac{169\sqrt{3}}{3}$ (d) $169\sqrt{3}$

Q.233. The points A, B and C lie on a circle with center O. ∠ACB = 46.5°. What is the measure of ∠AOB on the mirror AB?
RRB NTPC 31/01/2021 (Morning)
(a) 90° (b) 92° (c) 93° (d) 94°

Q.234. A chord of length 24 cm is at a distance of 5 cm from the centre of a circle. The radius of the circle is___cm.
RRB NTPC 31/01/2021 (Evening)
(a) 13 (b) 14 (c) 10 (d) 12

Q.235. In a ΔABC, if 2∠A = 3∠B = 6∠C, then find the value of ∠C.
RRB NTPC 31/01/2021 (Evening)
(a) 60° (b) 30° (c) 45° (d) 90°

Q.236. The points A(1, 2), B(3, 4) and C(4, 1) are the vertices of a triangle which is:
RRB NTPC 01/02/2021 (Morning)
(a) equilateral (b) right-angled
(c) scalene (d) isosceles

Q.237. The points A, B and C lie on a circle with centre O. The ∠ACB = 47.5°. What is the ∠AOB on the minor AB?
RRB NTPC 01/02/2021 (Evening)
(a) 92° (b) 95° (c) 94° (d) 93°

Q.238. If ABCD is a cyclic quadrilateral and ABC is an equilateral triangle, find the angle of CDA.
RRB NTPC 01/02/2021 (Evening)
(a) 45° (b) 120° (c) 90° (d) 60°

Q.239. The two unequal sides of a rectangle are in the ratio 3:4. If the perimeter is 42 cm, then the length of the diagonal will be:
RRB NTPC 02/02/2021 (Morning)
(a) 30 cm (b) 25 cm (c) 15 cm (d) 35 cm

Q.240. The perimeter of an equilateral triangle is 36 m and the length of its altitude is $6\sqrt{3}$ m. The area of triangle is:
RRB NTPC 03/02/2021 (Morning)
(a) 36 $\sqrt{3}m^2$ (b) $18m^2$ (c) $24m^2$ (d) $12m^2$

Q.241. In a triangle ABC, incenter is at O. Find the angle BAC if angle BOC = 110^0
RRB NTPC 03/02/2021 (Evening)
(a) 50^0 (b) 40^0 (c) 20^0 (d) 30^0

Q.242. Find the degree measure of an angle subtended at the centre of a circle of radius 28 cm by an arc of length 22 cm.
RRB NTPC 04/02/2021 (Evening)
(a) 40° (b) 45° (c) 55° (d) 50°

Q.243. Find the ratio of the measure of an angle of a regular pentagon to that of a regular octagon.
RRB NTPC 04/02/2021 (Evening)
(a) 6 : 7 (b) 4 : 5 (c) 5 : 6 (d) 7 : 8

Q.244. The area of an isosceles right angle triangle is 81 cm². Find the length

of its hypotenuse.
RRB NTPC 04/02/2021 (Evening)
(a) 16 cm (b) 18 cm (c) 14 cm (d) 22 cm

Q.245. If one angle of a parallelogram is 39^0less than twice the smallest angle, then the smallest angle of the parallelogram is:
RRB NTPC 08/02/2021 (Morning)
(a) 74° (b) 72 ° (c) 73° (d) 75°

Q.246. What is the sum of the angle complementary to 15^o and the angle supplementary to 125^o ?
RRB NTPC 09/02/2021 (Morning)
(a) 150^o (b) 120^o (c) 130^o (d) 135^o

Q.247. In triangle ABC, ∠A is 12^0 more than the measure of ∠C. The measure of ∠B is 4 time as great as the measure of ∠C. What are the measures of angles A, B and C respectively?
RRB NTPC 09/02/2021 (Morning)
(a) $40^o, 112^o, 18^o$ (b) $40^o, 112^o, 28^o$
(c) $35^o, 92^o, 23^o$ (d) $40^o, 120^o, 28^o$

Q.248. The sum of two angles is 155° and their difference is $\frac{\pi}{2}$, the value of the greater angle (in radians) is..
RRB NTPC 09/02/2021 (Evening)
(a) $\frac{53\pi}{72}$ (b) $\frac{49\pi}{72}$ (c) $\frac{47\pi}{72}$ (d) $\frac{51\pi}{72}$

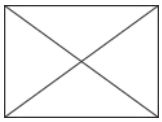
Q.249. The 4 angles of a pentagon are 70°, 110°, 135° and 95°. Find the measure of the fifth angle of the pentagon.
RRB NTPC 09/02/2021 (Evening)
(a) 134° (b) 128° (c) 130° (d) 132°

Q.250. The radius of the circle in which a central angle of 60° intercepts an arc of length 35 cm is:
RRB NTPC 10/02/2021 (Evening)
(a) 35 π cm (b) $\frac{100}{\pi}$ cm
(c) $\frac{35}{\pi}$ cm (d) $\frac{105}{\pi}$ cm

Q.251. Two adjacent angles form an angle of 100°. The larger angle is 20° less than five times the smaller angle.
The larger angle is:
RRB NTPC 11/02/2021 (Morning)
(a) 90° (b) 75° (c) 80° (d) 70°

Q.252. When an arm of an angle is extended to double its length then the measure of the angle.
RRB NTPC 11/02/2021 (Morning)
(a) Triples (b) Becomes half
(c Doubles (d) Remains the same

Q.253. What is the sum of all angles of all triangles in the given figure?



RRB NTPC 12/02/2021 (Morning)
(a) 1080^o (b) 720^o (c) 360^o (d) 1440^o

Q.254. In a rhombus ABCD, if ∠ACB= 40^0, then ∠ADB = ?
RRB NTPC 15/02/2021 (Evening)
(a) 70^0 (b) 50^0 (c) 45^0 (d) 60^0

Q.255. P is the midpoint of side BC of parallelogram ABCD such that ∠BAP =∠ DAP If AD=10cm, then CD= ?
RRB NTPC 15/02/2021 (Evening)
(a) 10 cm (b) 8 cm (c) 5 cm (d) 6 cm

Q.256. If the difference between the areas of the circumcircle and the incircle of an equilateral triangle is 66 cm², then the area of the triangle is:
RRB NTPC 16/02/2021 (Morning)
(a) $2\sqrt{3}\ cm^2$ (b) $10\sqrt{3}\ cm^2$
(c) $21\sqrt{3}\ cm^2$ (d) $20\sqrt{3}\ cm^2$

Q.257. The ratio of the areas of two triangles is 4 : 3 and the ratio of their heights is 3 : 4. Find the ratio of their bases.
RRB NTPC 16/02/2021 (Evening)
(a) 14 : 9 (b) 16 : 3 (c) 16 : 9 (d) 12 : 7

Q.258. The base and the altitude of a right-angled triangle are 15 cm and 8 cm respectively. What is the altitude from the opposite vertex to its hypotenuse?
RRB NTPC 16/02/2021 (Evening)
(a) $7\frac{1}{15}$cm (b) $1\frac{7}{17}$cm
(c) $7\frac{1}{17}$cm (d) $7\frac{11}{17}$cm

Q.259. In a triangle ABC, points D and E are on the sides AB and AC such that DE is parallel to BC and $\frac{AD}{BD} = \frac{3}{5}$ if AC = 4 cm. Then AE = ?
RRB NTPC 17/02/2021 (Morning)
(a) 1.5 cm (b) 1.8 cm
(c) 2 cm (d) 2.4 cm

Q.260. If the side of an equilateral triangle is 2 cm, then find the area and the altitude of the triangle.
RRB NTPC 17/02/2021 (Morning)
(a) Area = $\frac{3}{2}\ cm^2$ and altitude = $\sqrt{3}\ cm$
(b) Area = $\sqrt{3}\ cm^2$ and altitude = $\sqrt{3}\ cm$
(c) Area = $\sqrt{3}\ cm^2$ and altitude = $\frac{2}{3}\ cm$
(d) Area = $\frac{2}{3}\ cm^2$ and altitude = $\sqrt{3}\ cm$

Q.261. Which of the following statements is FALSE?
RRB NTPC 22/02/2021 (Evening)
(a) In any triangle, the sum of any two sides of the triangle is greater than the length of the third side.
(b) The greatest side of any triangle makes acute angles with each of the other sides.
(c) In any triangle, the sum of any two angles of the triangle is greater than the measure of the third angle.
(d) In any triangle the difference between the lengths of two sides of an triangle is smaller than the length of the third side.

Q.262. Which of the following statements is true with respect to a triangle?
RRB NTPC 22/02/2021 (Evening)
(a) The concurrent point of altitudes is called centroid
(b) The sum of medians is less than perimeter
(c) The concurrent point of internal angle bisectors is called orthocentre.
(d) Any two sides together are less than twice the median of remaining side.

Q.263. The perimeter of two similar triangles $\triangle XYZ\ and\ \triangle LMN$are 48 cm and 32cm respectively. If LM = 12cm, then what is the length of XY?
RRB NTPC 23/02/2021 (Morning)
(a) 18cm (b) 12cm (c) 16cm (d) 14cm

Q.264. The ratio of bases of two triangles is 4 : 5 and that of their area is 8 : 15. What is the ratio of their corresponding altitude?
RRB NTPC 23/02/2021 (Morning)
(a) 3 : 2 (b) 2 : 3 (c) 1 : 2 (d) 1 : 3

Q.265. In a triangle ABC, ∠B = 90°, ∠C = 45° and D is the midpoint of AC. If AC = 4 $\sqrt{2}$ units, then BD is:
RRB NTPC 27/02/2021 (Morning)
(a) $2\sqrt{2}$units (b) $3\sqrt{2}$units
(c) $4\sqrt{2}$units (d) $\sqrt{2}$units

Q.266. Read the given statements carefully and decide which option is correct with respect to the statements.
Statements :
1. In any triangle, the concurrent point of medians is a centroid.
2. In any triangle, the concurrent point of altitudes is an orthocentre.
3. In any triangle, the concurrent point of internal angular bisector is an in-centre.

RRB NTPC 27/02/2021 (Morning)
(a) Only statement 3 is correct
(b) Only statement 2 is correct
(c) All statements 1, 2 and 3 are correct
(d) Only statement 1 is correct

Q.267. Angles A,B and C of a triangle are in arithmetic progression. M is a point on BC such that AM is perpendicular to BC. What is $\frac{BM}{AB}$?
RRB NTPC 01/03/2021 (Morning)
(a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) $\frac{1}{3}$ (d) $\frac{1}{4}$

Q.268. A circle of radius 9 cm circumscribed a regular hexagon. The length of the side of the hexagon is:
RRB NTPC 01/03/2021 (Evening)
(a) 7 cm (b) 9 cm (c) 10 cm (d) 12 cm

Q.269. Find the number of sides of a regular polygon if the measure of each of its exterior angles is 36°.
RRB NTPC 01/03/2021 (Evening)
(a) 10 (b) 25 (c) 6 (d) 12

Q.270. If the angle of a sector in a pie diagram is $135^o, then$ it is equivalent to _____ of the pie diagram.
RRB NTPC 05/03/2021 (Evening)
(a) $\frac{3}{8}$ (b) $\frac{1}{4}$ (c) $\frac{3}{4}$ (d) $\frac{1}{8}$

Q.271. ABCD is a parallelogram in which ∠A = x + 20^o and ∠C= 3x - 10^o.The value of x is _____
RRB NTPC 05/03/2021 (Evening)
(a) 15^o (b) 30^o (c) 40^o (d) 60^o

Q.272. In ΔABC, $\overline{PQ}$ II $\overline{AB}$. P and Q are on BC and CA respectively. If CQ : QA = 1:3 and CP=4, then what is the value of BC?
RRB NTPC 07/03/2021 (Morning)
(a) 16 (b) 12 (c) 8 (d) 4

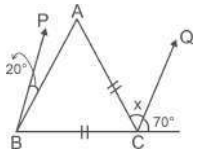
Q.273. Two intersecting circles are said to be orthogonal if the angle between them is a/an_____.
RRB NTPC 07/03/2021 (Morning)
(a) straight angle (b) acute angle
(c) obtuse angle (d) right angle

Q.274. If the length of the diagonals of a rhombus are 32 cm and 24 cm, then the length of each side of the rhombus will be:
RRB NTPC 08/03/2021 (Morning)
(a) 30 cm (b) 20 cm (c) 40 cm (d) 10 cm

Q.275. The circumference of a circle is equal to the perimeter of an equilateral triangle. If the radius of the circle is 21 cm, what is the length of the side of the equilateral triangle?
RRB NTPC 08/03/2021 (Evening)
(a) 44 cm (b) 22 cm (c) 55 cm (d) 33 cm

Q.276. The sum of the angles of the various sections in a pie diagram is:
RRB NTPC 09/03/2021 (Morning)
(a) 270^o (b) 360^o (c) 180^o (d) 90^o

Q.277. In given figure, if BP II CQ and AC = BC, then the measure of x is:



RRB NTPC 11/03/2021 (Morning)
(a) 35^o (b) 20^o (c) 25^o (d) 30^o

Q.278. The diagonals of a quadrilateral ABCD bisect each other. In this quadrilateral, if ∠A = 45^o then ∠B = ?
RRB NTPC 11/03/2021 (Morning)
(a) 120^o (b) 135^o (c) 125^o (d) 115^o

Q.279. In rhombus ABCD, the diagonals intersect at point E. IF m∠ECB = 5a + 4 and m∠EBC = 4a + 5. Find m∠EBC.
RRB NTPC 11/03/2021 (Evening)
(a) 49° (b) 41° (c) 45° (d) 35°

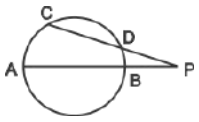
Q.280. A point is 13 cm from the center of a circle . The length of the tangent drawn from P to the circle is 12 cm . Find the radius of the circle.
RRB NTPC 12/03/2021 (Evening)
(a) 5 cm (b) 4 cm (c) 6 cm (d) 3 cm

Q.281. The length and breadth of a Rectangular field are in the ratio of 6 : 5. If the perimeter of the field is 110 m, then what will be the breadth (in m)?
RRB NTPC 13/03/2021 (Morning)
(a) 30 (b) 20 (c) 15 (d) 25

Q.282. The sum of two angles ∠A and ∠B of a triangle ΔABC is equal to its third angle. Find the measure of the third angle?
RRB NTPC 14/03/2021 (Evening)
(a) 100° (b) 60° (c) 90° (d) 50°

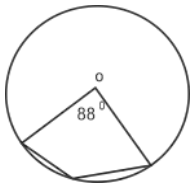
Q.283. Find the number of sides of a regular polygon if each interior angle is 165^o.
RRB NTPC 15/03/2021 (Morning)
(a) 24 (b) 20 (c) 26 (d) 22

Q.284. In the given circle. Diameter AB is extended to meet chord CD extended at P. If the lengths of the line segment AP, CP and DP are 12 cm, 8 cm and 6 cm, respectively. What is the length of the radius of the circle?



RRB NTPC 19/03/2021 (Morning)
(a) 2 cm (b) 6 cm (c) 8 cm (d) 4 cm

Q.285. In the given circle with center O. the acute angle at the center measures 88°. In the quadrilateral drawn inside the circle, what is the measure of the angle opposite to ∠O? [Figure is not drawn to scale]



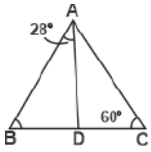
RRB NTPC 19/03/2021 (Morning)
(a) 88° (b) 68° (c) 272° (d)136°

Q.286. If the largest angle in a triangle is 75^o. What is the least possible value of the smallest angle of the triangle?
RRB NTPC 21/03/2021 (Evening)
(a) 30^o (b) 40^o (c) 76^o (d) 70^o

Q.287. What is the sum of the measures of the interior angles of a hexagon?
RRB NTPC 27/03/2021 (Morning)
(a) 720^o (b) 1080^o (c) 150^o (d) 810^o

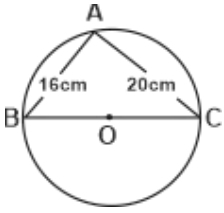
Q.288. The circumradius of a triangle is 9 cm while the inradius of it is 4 cm. What is the distance between the circumcentre and the incentre of the triangle?
RRB NTPC 27/03/2021 (Evening)
(a) 4 cm (b) 2 cm (c) 3 cm (d) 5 cm

Q.289. If $\frac{AB}{AC} = \frac{BD}{DC}$ then ∠ABC is:



RRB NTPC 01/04/2021 (Morning)
(a) 92° (b) 32° (c) 64° (d) 74°

Q.290. Find the area of ΔABC.



RRB NTPC 01/04/2021 (Morning)
(a) 32 cm^2 (b) 160 cm^2
(c) 320 cm^2 (d) 240 cm^2

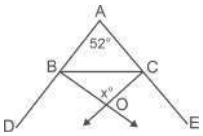
Q.291. In the given figure, AB is the diameter of the circle. AP is a tangent to

circle at A. Extended BC meets the tangent at P. ∠ AOC = 36^o. Find ∠BPQ .

RRB NTPC 01/04/2021 (Morning)

(a) 72^o (b) 54^o (c) 108^o (d) 126^o

Q.292. In the above figure, BO and CO are the angular bisectors of $\angle DBC$ and $\angle BCE$ respectively. The measure of x is _____.



RRB NTPC 01/04/2021 (Evening)

(a) 52° (b) 58° (c) 64° (d) 54°

Q.293. AB and CD are two chords of a circle. AB=6 cm, CD=8 cm and AB II CD. If the distance between AB and CD is 7 cm and the centre of the circle lies in the interior of the quadrilateral ABCD, then find the radius of the circle (in cm).

RRB NTPC 03/04/2021 (Morning)

(a) 5 (b) 8 (c) 7.5 (d) 10

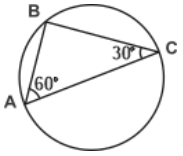
Q.294. AB is the diameter of a semicircle. C is a point on line AB,AC=6 cm, D is the point on the semicircle such that CD is perpendicular to AB and CD=9 cm. Find the diameter of the semicircle.

RRB NTPC 03/04/2021 (Morning)

(a) 15 cm (b) 7.5 cm

(c) 12 cm (d) 19.5 cm

Q.295. In the given figure, A, B and C are three points on a circle. If AB = 3 cm and BC = 4 cm, then the measure of the radius of the circle is:



RRB NTPC 06/04/2021 (Evening)

(a) 5 cm (b) 3 cm (c) $\frac{7}{2}$cm (d) $\frac{5}{2}$cm

Q.296. Which of the following statements is correct?

1.The angle between two tangents to a circle may be 0^o.

2.If a transversal intersects two lines such that a pair of alternate interior angles is equal, then the two lines are parallel.

3.The tangents at the end points of a diameter of a circle are perpendicular.

RRB NTPC 07/04/2021 (Evening)

(a) Only 1 (b) Both 1 and 2, but not 3

(c) Only 3 (d) Only 2

Q.297. In an isosceles ΔABC, if the measure of ∠A is twice that of the base ∠B , then the measure of ∠C will be:

RRB NTPC 08/04/2021 (Morning)

(a) 45^o (b) 90^o (c) 33^o (d) 30^o

Q.298. The sum of the consecutive angles of a parallelogram is equal to:

RRB NTPC 08/04/2021 (Morning)

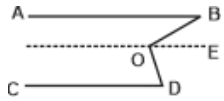
(a) 360^o (b) 120^o (c) 90^o (d) 180^o

Q.299. Circles are inscribed and circumscribed to a triangle whose sides are 3 cm, 4 cm and 5 cm. What is the ratio of radius of the in-circle to that of the circumcircle?

RRB NTPC 08/04/2021 (Evening)

(a) 3 : 5 (b) 1 : 5 (c) 2 : 5 (d) 5 : 2

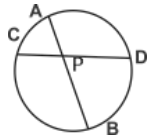
Q.300. In the given figure, AB and CD are parallel lines. O is a point such that angle CDO=70^o and angle DOB=100^o. Find angle ABO.



RRB NTPC 08/04/2021 (Evening)

(a) 80^o (b) 50^o (c) 30^o (d) 60^o

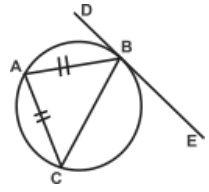
Q.301. In the given circle, chords AB and CD, intersect internally at P. If $\overline{CP}$ = 3cm and $\overline{DP}$ = 8 cm and the numerical value of the length of $\overline{AP}$ and $\overline{BP}$ are both natural numbers, then which of the following options CANNOT be the length of AB? (Diagram is not to scale)



RRB NTPC 23/07/2021 (Morning)

(a) 14 cm (b) 20 cm (c) 25 cm (d) 10 cm

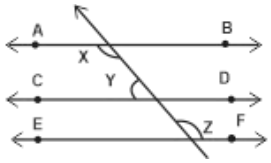
Q.302. In the given figure, DE is tangent to the circle at point B. ΔABC is constructed such that A and C are points on the circumference of the given circle, with $\overline{AB} = \overline{AC}$. If ∠ABC=$65^o$,then what is ∠BAC?



RRB NTPC 24/07/2021 (Evening)

(a) 60^o (b) 40^o (c) 80^o (d) 50^o

Q.303. In the given figure, the three parallel lines are cut through by a transversal.Of the marked angles, the greater two are of equal measure. The ratio of a greater angle to the smaller angle is 7:3. What is the measure of the greater angle?



RRB NTPC 24/07/2021 (Evening)

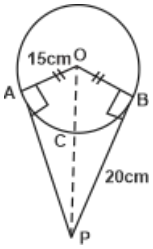
(a) 126^o (b) 90^o (c) 18^o (d) 110^o

Q.304. The angle of a sector is 30°. If its radius is 42cm, then the length of the arc of the sector is :

RRB NTPC 26/07/2021 (Morning)

(a) 20 cm (b) 22 m (c) 22cm (d) 32cm

Q.305. In the given figure, if PB=20 cm and OA = 15 cm, then find the shortest distance between the circle and P.



RRB NTPC 26/07/2021 (Morning)

(a) 20 cm (b) 25 cm (c) 15 cm (d) 10 cm

Q.306. The number of non-congruent acute isosceles triangles in which one angle is 4 times another angle is :

RRB NTPC 26/07/2021 (Evening)

(a) 4 (b) 1 (c) 2 (d) 3

Q.307. The lengths of the two shorter sides of a right triangle are 7 cm and 24 cm. What is the length of the circumradius of this triangle?

RRB NTPC 26/07/2021 (Evening)

(a) 12.5 cm (b) 16 cm

(c) 15.5 cm (d) 12 cm

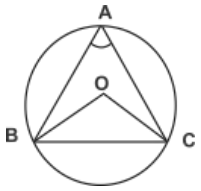
Q.308. A, B and C are three points on a circle such that angles subtended by the chords AB and AC at the centre O are 90^o

and 110^o respectively and ∠BAC > ∠BAO then ∠BAC = ?
RRB NTPC 26/07/2021 (Evening)
(a) 80^o (b) 100^o (c) 55^o (d) 45^o

Q.309. The two sides containing the right angle in a right -angled triangle are 8 cm and 15 cm respectively. What is the length of the hypotenuse?
RRB NTPC 26/07/2021 (Evening)
(a) $\sqrt{161}\ cm$ (b) 25 cm
(c) 23 cm (d) 17 cm

Q.310. In a ΔABC, if $\angle A + \angle B = 110^o$ and $\angle B - \angle A = 10^o$, then which of the following statements holds true for the triangle ?
RRB NTPC 31/07/2021 (Morning)
(a) AB is the longest and AC is the shortest side.
(b) AB is the longest side and BC is the shortest side.
(c) The length of AB is the same as that of BC.
(d) AC is the longest side and BC is the shortest side.

Q.311. In the given figure, the measure of ∠BAC + ∠OBC is equal to:



RRB NTPC 31/07/2021 (Morning)
(a) 45^o (b) Cannot be determined
(c) 90^o (d) 60^o

Q.312. ABCD is a square and Q is a point in its interior such that ΔQAB is equilateral. The measure of ∠QCB is :
RRB NTPC 31/07/2021 (Morning)
(a) 60^o (b) 45^o (c) 75^o (d) 30^o

RRB JE (22/05/2019 to 28/06/2019)

Q.313. If a right triangle is right angled at A and AC = 6 ,BC = 10 find the value of tan B × tan C.
RRB JE 26/05/2019 (Afternoon)
(a) $\frac{1}{2}$ (b) $\frac{3}{5}$ (c) 1 (d) $\frac{4}{5}$

Q.314. If 'O' is the circumcentre of a triangle ABC and OD is perpendicular to BC, then find ∠BOD.
RRB JE 27/05/2019 (Afternoon)
(a) $(\frac{1}{2})\angle A$ (b) ∠A
(c) 90° - ∠A (d) 2∠A

Q.315. D is a point on BC of ΔABC where BD = $\left(\frac{1}{2}\right)$DC Find the ratio of areas of Δ ABD and ΔABC.
RRB JE 30/05/2019 (Afternoon)
(a) 1 : 3 (b) 3 : 1 (c) 3 : 2 (d) 2 : 3

Q.316. Area of a field in the shape of a trapezium is 1440 m². The perpendicular distance between the parallel sides is 24 m. The ratio of the parallel sides is 5 : 3. Find the length of the longer parallel side.
RRB JE 30/05/2019 (Evening)
(a) 30m (b) 60m (c) 45m (d) 75m

Q.317. In ΔABC, D and E are points on sides AB and AC respectively such that DE || BC and AD : DB = 3 : 1. If EA = 3.3 cm, then find the value of AC.
RRB JE 01/06/2019 (Afternoon)
(a) 5.5 cm (b) 4 cm
(c) 4.4 cm (d) 1.1 cm

Q.318.D, E ,F are midpoints of the sides BC, CA, AB of a ΔABC. If area of ΔABC is 20 cm^2, then finds the area of the trapezium FBCE.
RRB JE 02/06/2019 (Afternoon)
(a) 10 cm^2 (b) 5 cm^2
(c) 15 cm^2 (d) 12 cm^2

Q.319. In a Δ ABC, ∠B = 90°, AB = 5 cm. Construction of ΔABC is not possible if BC ~ AC =___
RRB JE 02/06/2019 (Afternoon)
(a) 2.5 cm (b) 4 cm (c) 6.5 cm (d) 4.8 cm

Q.320. ΔABC is similar to ΔPQR, such that their perimeters are 36 and 24 respectively. If PQ = 10,then find AB.
RRB JE 26/06/2019 (Morning)
(a)15 (b)16 (c) 20 (d) 18

RRB ALP Tier - 2 (21/01/2019 to 08/02/2019)

Q.321. What is the maximum number of parallel tangents a circle can have?
ALP Tier II 21/01/2019 (Afternoon)
(a) four (b) two (c) three (d) infinite

Q.322. The sides of a triangle are 4 cm, 6 cm and 8 cm respectively. Find the radius of the incircle of the Triangle ?
ALP Tier II 21/01/2019 (Afternoon)
(a) $\sqrt{5}$ cm (b) 5 cm
(c) $\sqrt{5}$/3 cm (d) $\sqrt{15}$/3 cm

Q.323. If the triangles $A_1B_1C_1$ and $A_2B_2C_2$ are similar, then which of the following option will be correct?
ALP Tier II 21/01/2019 (Afternoon)
(a) $\frac{A_1B_1}{A_2B_2} = \frac{A_1C_1}{A_2C_2} \neq \frac{B_1C_1}{B_2C_2}$
(b) $\frac{A_1B_1}{A_2B_2} \neq \frac{A_1C_1}{A_2C_2} = \frac{B_1C_1}{B_2C_2}$
(c) $\frac{A_1B_1}{A_2B_2} \neq \frac{A_1C_1}{A_2C_2} \neq \frac{B_1C_1}{B_2C_2}$
(d) $\frac{A_1B_1}{A_2B_2} = \frac{A_1C_1}{A_2C_2} = \frac{B_1C_1}{B_2C_2}$

Q.324. If in triangle ABC, AB = 4 cm, BC = 6 cm and AC = 7 cm and in triangle PQR, QR = 12 cm and ∠A = ∠P, ∠B = ∠Q, then Find out the length of PQ?
ALP Tier II 21/01/2019 (Afternoon)
(a) 8 cm (b) 12 cm (c) 14 cm (d) 10 cm

Q.325. If a, b and c are the three sides of a triangle and if $a^2 + b^2 = c^2$, then which triangle is it?
ALP Tier II 21/01/2019 (Afternoon)
(a) equilateral triangle
(b) acute-angled triangle but not equilateral triangle
(c) obtuse angled triangle
(d) right angled triangle

Q.326. The sides of some triangles are given below. Can you tell which of these are right triangles?
1. 7 cm, 24 cm, 25 cm
2. 3 cm, 8 cm, 6 cm
3. 50 cm, 80 cm, 100 cm
4. 17 cm, 15 cm, 8 cm
ALP Tier II 21/01/2019 (Afternoon)
(a) 2 and 3 (b) 1 and 2
(c) 1 and 4 (d) 1 and 3

Q.327. A tangent drawn from a point P to a circle meets it at point A. Chord AB subtends an angle of 40° at a point on the circumference on the other side of P. Angle PAB will be:
ALP Tier II 21/01/2019 (Afternoon)
(a) 20° (b) 40° (c) 80° (d) 90°

Q.328. What is the use of 'Parkar (Compass)' to make?
ALP Tier II 21/01/2019 (Evening)
(a) rectangle (b) triangle
(c) circle (d) straight line

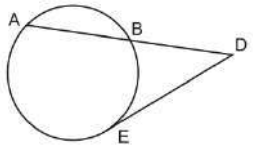
Q.329. ΔDEF is the same as ΔPQR. If the ratio of the semi-perimeters of ΔDEF and ΔPQR is 4 : 5 and if PQ = 15 cm, then the length of DE is:
ALP Tier II 21/01/2019 (Evening)
(a)12 cm (b)10 cm (c) 8 cm (d) 20 cm

RPF S.I. (19/12/2018 to 16/01/2019)

Q.330. If the radius of a circle is increased by 7 times, its circumference will be how many times of its former circumference?
RPF S.I. 19/12/2018 (Evening)
(a) 6 (b) 7 (c) 9 (d) 8

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.331.



In the circle above, chord $\overline{AB}$ is extended to meet the tangent $\overline{DE}$ at D. If $\overline{AB}$ = 12 cm and $\overline{DE}$ = 8 cm, find the length of $\overline{BD}$
RRB ALP 09/08/2018 (Morning)
(a) 6 cm (b) 4√6 cm (c) 4 cm (d) 5 cm

Q.332. To draw a pair of tangents to a circle which are inclined to each other at an angle of 75°, it is required to draw tangents at the end points of those two radii of the circle, the angle between whom is
RRB ALP 09/08/2018 (Afternoon)
(a) 105° (b) 65° (c) 95° (d)75°

Q.333. What will be the acute angle between the hour-hand and the minute-hand at 4:37 p.m.?
RRB ALP 10/08/2018 (Morning)
(a) 18° (b) 83.5° (c) 6.5° (d) 18.5°

Q.334. In △ABC, AB = 8 cm. ∠A is bisected internally to intersect BC at D. BD= 6cm and DC = 7.5 cm. What is the length of CA?
RRB ALP 10/08/2018 (Evening)
(a)12 cm (b)12.5 cm (c)10 cm(d)10.5 cm

Q.335. If ABCD is a trapezium, AC and BD are the diagonals intersecting each other at point O. Then AC:BD is
RRB ALP 10/08/2018 (Evening)
(a) AD:BC (b) AB+AD:DC+BC
(c) AB:CD (d) AO-OC:OB-OD

Q.336. In a triangle ABC, right angled at B, BC=15cm, and AB=8cm. A circle is inscribed in triangle ABC. Then the radius of the circle is:
RRB ALP 13/08/2018 (Evening)
(a) 2 cm (b) 4 cm (c) 3 cm (d) 1 cm

Q.337. ABC is an equilateral triangle of side 6cm. If a circle of radius 1 cm is moving inside and along the sides of the triangle, then the locus of the centre of the circle is an equilateral triangle of side is: RRB ALP 14/08/2018 (Evening)
(a) (3+√3) cm (b) (6-2√3) cm
(c) 5 cm (d) 4 cm

Q.338. Find the length of a transverse common tangent of the two circles whose radii are 3.5cm, 4.5cm and the distance between their centres is 10cm.
RRB ALP 17/08/2018 (Afternoon)
(a) 8 cm (b) 3.6 cm (c) 6.4 cm (d) 6 cm

Q.339. The number of diagonals in a pentadecagon is:
RRB ALP 17/08/2018 (Afternoon)
(a) 60 (b) 90 (c) 30 (d) 45

Q.340. If tangents PA and PB from a point P to a circle with centre O are inclined to each other at an angle of 110° then the angle POA is:
RRB ALP 20/08/2018 (Evening)
(a) 70° (b) 35° (c) 50° (d) 45°

Q.341. Three triangles are marked out of a bigger triangle at the three vertices such that each side of each of the smaller triangles is one-third as long as each corresponding side of the bigger triangle. The ratio of the area of the three small triangles taken together to that of the rest of the bigger triangle is?
RRB ALP 21/08/2018 (Morning)
(a) 3:1 (b) 1:3 (c) 1:2 (d) 1:9

Q.342. The area of a rhombus is 24 m^2 and the length of one of its diagonals is 8 m. The length of each side of the rhombus will be:
RRB ALP 21/08/2018 (Evening)
(a) 6 m (b) 4 m (c) 10m (d) 5 m

Q.343. The base of a triangle is one-third of the base of a parallelogram having the same area as that of the triangle. The ratio of the corresponding heights of the triangle to the parallelogram will be:
RRB ALP 29/08/2018 (Morning)
(a) 3 : 2 (b) 4 : 1 (c) 3 : 1 (d) 6 : 1

Q.344. In Δ ABC, AB = 12 cm. ∠A is bisected internally to intersect BC at D. BD = 7 cm and DC = 8.75 cm. What is the length of CA?
RRB ALP 30/08/2018 (Afternoon)
(a) 13.5 cm (b) 15 cm
(c) 14.5 cm (d)12.5 cm

Q.345. If the ratio of the corresponding sides of two similar triangles is 2 : 3,then the ratio of their corresponding altitudes is RRB ALP 30/08/2018 (Evening)
(a) 2:3 (b) 16:81 (c) 4:9 (d) 3:2

Q.346. Five angles of a hexagon measure 116° each. What is the measure of the remaining angle ?
RRB ALP 31/08/2018 (Afternoon)
(a) 152° (b) 126° (c) 140° (d) 116°

Q.347. The length of on the side of a rhombus is 17 cm and one of the diagonals was 16 cm. Find the length of the other diagonal.
RRB ALP 31/08/2018 (Afternoon)
(a) 16 cm (b) 30cm (c) 32 cm (d) 20 cm

Answer Key :-

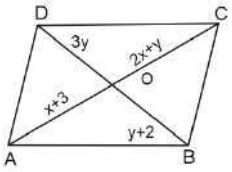
1.(a)	2.(c)	3.(b)	4.(d)
5.(a)	6.(c)	7.(b)	8.(b)
9.(d)	10.(a)	11.(a)	12.(c)
13.(a)	14.(b)	15.(d)	16.(c)
17.(b)	18.(d)	19.(c)	20.(a)
21.(c)	22.(c)	23.(c)	24.(d)
25.(c)	26.(a)	27.(c)	28.(b)
29.(d)	30.(d)	31.(d)	32.(a)
33.(c)	34.(b)	35.(c)	36.(d)
37.(d)	38.(a)	39.(c)	40.(c)
41.(a)	42.(b)	43.(b)	44.(a)
45.(b)	46.(d)	47.(a)	48.(c)
49.(b)	50.(b)	51.(b)	52.(c)
53.(a)	54.(c)	55.(d)	56.(b)
57.(a)	58.(c)	59.(c)	60.(c)
61.(c)	62.(c)	63.(b)	64.(d)
65.(c)	66.(d)	67.(d)	68.(a)
69.(a)	70.(d)	71.(b)	72.(b)
73.(b)	74.(a)	75.(a)	76.(c)
77.(b)	78.(c)	79.(c)	80.(c)
81.(b)	82.(d)	83.(a)	84.(d)
85.(d)	86.(a)	87.(a)	88.(a)
89.(b)	90.(c)	91.(b)	92.(b)
93.(d)	94.(c)	95.(d)	96.(d)
97.(a)	98.(c)	99.(b)	100.(d)
101.(c)	102.(b)	103.(d)	104.(b)
105.(c)	106.(a)	107.(b)	108.(d)
109.(b)	110.(b)	111.(c)	112.(c)
113.(d)	114.(c)	115.(a)	116.(c)
117.(d)	118.(b)	119.(d)	120.(b)
121.(c)	122.(c)	123.(b)	124.(a)
125.(a)	126.(d)	127.(c)	128.(c)
129.(b)	130.(d)	131.(d)	132.(a)
133.(c)	134.(a)	135.(a)	136.(b)
137.(a)	138.(a)	139.(c)	140.(c)
141.(a)	142.(b)	143.(a)	144.(b)
145.(a)	146.(b)	147.(c)	148.(c)

149.(b)	150.(d)	151.(c)	152.(c)
153.(a)	154.(b)	155.(b)	156.(b)
157.(b)	158.(c)	159.(d)	160.(b)
161.(d)	162.(d)	163.(d)	164.(b)
165.(b)	166.(a)	167.(b)	168.(a)
169.(a)	170.(b)	171.(c)	172.(c)
173.(b)	174.(a)	175.(c)	176.(b)
177.(c)	178.(a)	179.(b)	180.(d)
181.(d)	182.(d)	183.(d)	184.(d)
185.(c)	186.(b)	187.(c)	188.(c)
189.(b)	190.(d)	191.(a)	192.(d)
193.(b)	194.(b)	195.(a)	196.(b)
197.(c)	198.(c)	199.(c)	200.(b)
201.(a)	202.(a)	203.(a)	204.(b)
205.(d)	206.(b)	207.(b)	208.(a)
209.(d)	210.(a)	211.(a)	212.(d)
213.(b)	214.(b)	215.(d)	216.(a)
217.(d)	218.(a)	219.(a)	220.(d)
221.(a)	222.(c)	223.(d)	224.(a)
225.(a)	226.(b)	227.(d)	228.(c)
229.(d)	230.(b)	231.(b)	232.(a)
233.(c)	234.(a)	235.(b)	236.(d)
237.(b)	238.(b)	239.(c)	240.(a)
241.(b)	242.(b)	243.(b)	244.(b)
245.(c)	246.(c)	247.(b)	248.(b)
249.(c)	250.(d)	251.(c)	252.(d)
253.(d)	254.(b)	255.(c)	256.(c)
257.(c)	258.(c)	259.(a)	260.(b)
261.(c)	262.(b)	263.(a)	264.(b)
265.(a)	266.(c)	267.(a)	268.(b)
269.(a)	270.(a)	271.(a)	272.(a)
273.(d)	274.(b)	275.(a)	276.(b)
277.(d)	278.(b)	279.(b)	280.(a)
281.(d)	282.(c)	283.(a)	284.(d)
285.(d)	286.(a)	287.(a)	288.(c)
289.(c)	290.(b)	291.(c)	292.(c)
293.(a)	294.(d)	295.(d)	296.(b)
297.(a)	298.(d)	299.(c)	300.(c)
301.(b)	302.(d)	303.(a)	304.(c)
305.(d)	306.(b)	307.(a)	308.(a)
309.(d)	310.(b)	311.(c)	312.(c)
313.(c)	314.(b)	315.(a)	316.(d)
317.(c)	318.(c)	319.(c)	320.(a)
321.(b)	322.(d)	323.(d)	324.(a)
325.(d)	326.(c)	327.(b)	328.(c)
329.(a)	330.(b)	331.(c)	332.(a)

333.(b)	334.(c)	335.(d)	336.(c)
337.(b)	338.(d)	339.(b)	340.(b)
341.(c)	342.(d)	343.(d)	344.(b)
345.(a)	346.(c)	347.(b)	

Solutions:-

Sol.1.(a)



Given, OA = x + 3 , OB = y + 2 , OC = 2x + y , OD = 3y

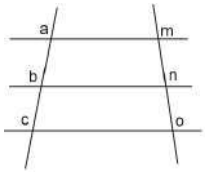
Since , the diagonals of the parallelogram bisect itself.

$3y = y + 2 \Rightarrow 3y - y = 2$

$\Rightarrow 2y = 2 \Rightarrow y = 1$..... (1)

$Now, x + 3 = 2x + y \Rightarrow 2x - x = 3 - 1 \Rightarrow x = 2$

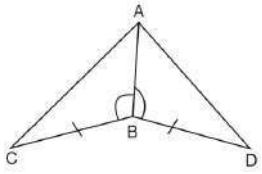
Sol.2.(c)



From the properties of intercept theorem,

$\frac{ab}{bc} = \frac{mn}{no} = \frac{3}{4}$

Sol.3.(b)



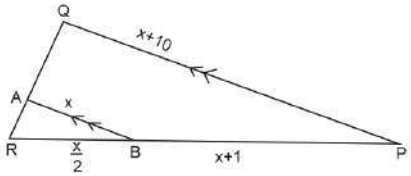
∠ABC = ∠ABD(given)

BC = BD (given)

AB = AB (common)

By SAS , Δ CAB ≅ ΔDAB

Sol.4.(d)



$\frac{\frac{x}{2}}{\frac{x}{2} + x + 1} = \frac{x}{x+10}$

$\frac{x}{3x+2} = \frac{x}{x+10}$

$x + 10 = 3x + 2 \Rightarrow x = 4$

PQ = 4 + 10 = 4 + 10 = 14 units.

Sol.5.(a) Let the smaller angle = x and larger angle = 3x - 6

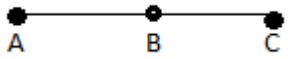
Since the angles are complementary

x + 3x - 6 = 90

⇒ 4x = 96 ⇒ x = 24

Larger angle = 3 x 24 - 6 = 66°

Sol.6.(c)



If B lie on AC, then A, B and C are collinear points.

$AB = x + 3\ ;\ BC = 2x\ ;\ AC = 4x - 5$

$AB + BC = AC$

$\Rightarrow (x + 3) + (2x) = 4x - 5$

$\Rightarrow 3x - 4x = -5 - 3$

$\Rightarrow -x = -8 \Rightarrow x = 8$

Sol.7.(b) Diagonals of a rectangle bisect each other.

Sol.8.(b) Let the length and breadth of the parallelogram be 3x and 2x

Perimeter = 2 (length + breadth)

$2(3x + 2x) = 65 \Rightarrow 10x = 65 \Rightarrow x = 6.5$

Smaller side = 2x = 2 × 6.5 = 13 cm

Sol.9.(d)

Sum of all interior angles : exterior angle

= (n - 2) × 180 : $\frac{360}{n}$ = 24:1

$\frac{n(n-2)180}{360} = \frac{24}{1}$

$\Rightarrow n(n - 2) = 48$

$\Rightarrow n^2 - 2n - 48 = 0$

$\Rightarrow n^2 - 8n + 6n - 48 = 0$

$\Rightarrow (n - 8)(n + 6) = 0 \Rightarrow n = 8\ or\ -6$

Side of a polygon is always positive , it has 8 sides.

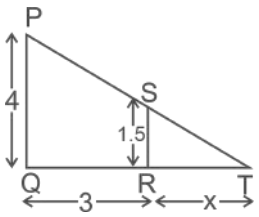
Sol.10.(a) ΔABC ≅ ΔPQR

For congruency, corresponding sides need to be equal.

m($\overline{BC}$) = m($\overline{RP}$) (it is not necessarily true because these are not corresponding sides)

Therefore, option (a) is correct.

Sol.11.(a)



Using similarity in ΔPTQ and ΔSTR ,

$\frac{x}{x+3} = \frac{1.5}{4} \rightarrow 2.5x = 4.5$

Boy's shadow $(x) = 1.8\ m$

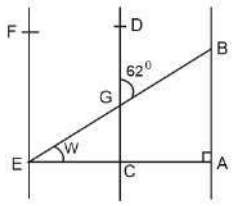
Sol.12.(c)

Let the two interior angles are 2x and 3x

$2x + 3x = 180 \Rightarrow 5x = 180 \Rightarrow x = 36$

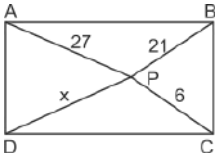
Greater angle = 3x = 3 × 36 = 108°

Sol.13.(a)



∠EGC = ∠BGD = 62°
(Vertically opposite angles)
Now, In ΔEGC, $\angle E + \angle EGC + 90° = 180$
Then , $w = 180 - 90 - 62 = 28°$

Sol.14.(b) Let PD = x



In rectangle ,
$AP^2 + PC^2 = PD^2 + PB^2$
So ,
$27^2 + 6^2 = x^2 + 21^2$
$\Rightarrow 729 + 36 = x^2 + 441$
$\Rightarrow x^2 = 324 \Rightarrow$ PD (x) = 18 cm

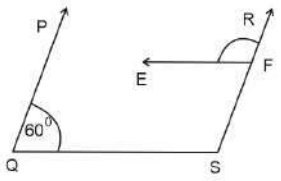
Sol.15.(d)
a = 15, b = 28, c = 41
$S = \frac{15 + 28 + 41}{2} = 42$
Area of triangle
$= \sqrt{42 \times (42 - 15)(42 - 28)(42 - 41)}$
$= \sqrt{42 \times 27 \times 14 \times 1} = 126\ cm^2$
Area of the triangle = $\frac{1}{2} \times 28 \times h$
$\Rightarrow h = \frac{126}{14} = 9\ cm$

Sol.16.(c)
Let the angles of the quadrilateral are 3x , 7x , 6x and 4x.
$3x + 7x + 6x + 4x = 360$
$\Rightarrow 20x = 360 \Rightarrow x = 18$
Angles are = 54°, 126°, 108° and 72°.
All angles are different , so it is a trapezium.

Sol.17.(b)
$(n - 2) \times 180 = \frac{(100 + 200)}{100} \times 360$
$\Rightarrow 180n - 360 = 1080$
$\Rightarrow 180n = 1080 + 360 \Rightarrow 180n = 1440$
$\Rightarrow n = 8$
Number of sides = 8 , Each interior angle
$= \frac{8 - 2}{8} \times 180 = 135°$

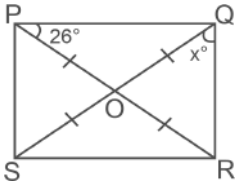
Sol.18.(d) If two triangles are similar, then the ratio of the area of both triangles is proportional to the square of the ratio of their corresponding sides.
So,
$\frac{Area\ of\ (\Delta PQR)}{Area\ of\ (\Delta ABC)} = \frac{QR^2}{BC^2} \Rightarrow \frac{5^2}{1^2} = 25$

Sol.19.(c)



QS || EF and RS || PQ
If m ∠PQS = 60° and ∠RSQ
= 180 - 60 = 120° (Linear pair)
Now , m∠RFE = ∠RSQ = 120°
(alternate interior angles)

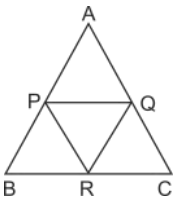
Sol.20.(a)



In ΔPQO ; PO = QO(Diagonal are equal)
∠OPQ = ∠OQP = 26°
X + 26 = 90°
(In rectangle each angle is 90°)
X = 64°

Sol.21.(c) non-overlapping triangles can be made in n-gon (polygon having n sides), by joining the vertices = n - 2
Therefore number of triangles = 11 - 2 = 9

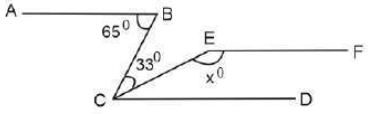
Sol.22.(c)



Area of triangle PQR = 6 cm^2
Then, area of triangle ABC = 6 × 4 = 24 cm^2

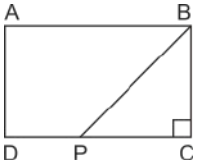
Sol.23.(c) Short Trick :-
We know that ,
$\angle DAE = \frac{1}{2}(\angle C - \angle B)$
$\Rightarrow \angle DAE = \frac{1}{2}(50° - 30°) = 10°$

Sol.24.(d)



In the given figure, AB || CD || EF.
∠ABC = ∠BCD
∠BCD = 65°
∠DCE = 65° - 33° = 32°
∠DCE + ∠CEF = 180°
32° + ∠CEF = 180°
∠CEF = 180° - 32° = 148°
Hence, value of x = 148°

Sol.25.(c)

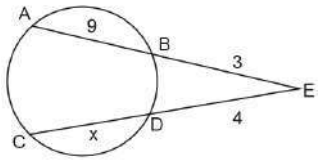


AB = DC = 4 m
PC = 1 m
DP = 4 - 1 = 3 m
BC = AD = 2.5 m
Area of quadrilateral ABCD = 4 × 2.5
= 10 m^2
Area of triangle = $\frac{1}{2} \times 2.5 \times 1 = 1.25\ m^2$
Area of quadrilateral ABDP = 10 - 1.25
= 8.75 m^2

Sol.26.(a)
Two sides of triangle = 24 cm and 26 cm
We know,
Third side < sum of other two sides
So, possible measure of third side
= 48 cm

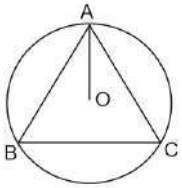
Sol.27.(c)
Sum of interior angles = (n – 2) × 180°
= (8 – 2) × 180 = 1080°
Ratio of sides → 1: 3 : 4 : 6 : 7 : 11 : 13 : 15
According to question,
x + 3x + 4x + 6x + 7x + 11x + 13x + 15x = 1080° ⇒ 60x = 1080° ⇒ x = 18°
Largest angle = 15x = 15 × 18 = 270°

Sol.28.(b)



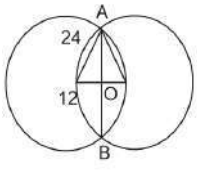
3 × 12 = 4(4 + x) ⇒ 36 = 16 + 4x
4x = 20 ⇒ x = 5
So, length of CD = 5 cm

Sol.29.(d) Given that, Radius of the circle = 12 cm



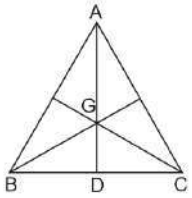
$\frac{Side}{\sqrt{3}}$ = 12 cm
So, The side of the triangle = $12\sqrt{3}$ cm

Sol.30.(d)



Length of common chord AB = 2 × AO
$= 2 \times \sqrt{24^2 - 12^2} = 2 \times 12\sqrt{3} = 24\sqrt{3}$ cm

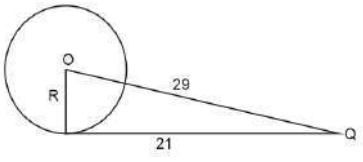
Sol.31.(d)



$\frac{AG}{DG} = \frac{(7y-3)}{3y} = \frac{2}{1} \Rightarrow y = 3$

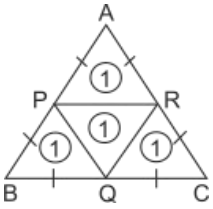
$AD = AG + DG = 18 + 9 = 27\ cm$

Sol.32.(a)



$R = \sqrt{29^2 - 21^2} = 20\ cm$

Sol.33.(c)



We know that the area of triangle

ΔPQR = $\frac{1}{4}$× ΔABC

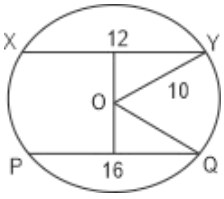
As the length of the side of the triangle, ΔABC is 4 cm.

⇒ Area of ΔABC = $\frac{\sqrt{3}}{4} \times 4 \times 4 = 4\sqrt{3}$

So, the area of triangle ΔPQR = $\frac{1}{4} \times 4\sqrt{3}$

$= \sqrt{3}\ cm^2$

Sol.34.(b)



From the above figure, we can see,
The distance between the two parallel chords is

$= \sqrt{R^2 - (\frac{\overline{XY}}{2})^2} + \sqrt{R^2 - (\frac{\overline{PQ}}{2})^2}$

$= \sqrt{100 - 36} + \sqrt{100 - 64} = 14$ cm

Sol.35.(c)

As we know, for the quadrilateral ABCD,
∠ABD+∠ACD+∠BAC = non-reflex ∠BDC
According to the question,
∠ABD = 55°, ∠ACD = 30°, ∠BAC = y° and non-reflex ∠BDC = x°,
⇒ x°= 55°+ 30°+ y° ⇒ x°- y°= 85°

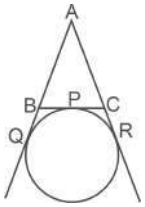
Sol.36.(d) In option (D), it is a right angled triangle.
a =7 cm, b = 24 cm, c = 25 cm
c = $\sqrt{a^2 + b^2} = \sqrt{7^2 + 24^2}$ = 25 cm.

Sol.37.(d) Two triangles will be similar if the ratio of corresponding sides are equal.

$\frac{AB}{PQ} = \frac{2.5}{5} = \frac{1}{2}, \frac{BC}{QR} = \frac{4.5}{9} = \frac{1}{2},$

$\frac{CA}{PR} = \frac{3.5}{7} = \frac{1}{2}$

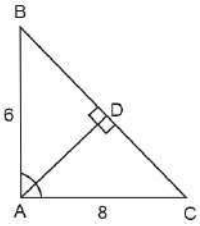
Sol.38.(a) A circle touches the side BC of triangle ABC at P. Side AB and AC are produced to touch the circle at points Q and R respectively. So, we can draw the following diagram,



Here we can get , $\overline{AQ} = \overline{AR}$, $\overline{BQ} = \overline{BP}$, $\overline{CP} = \overline{CR}$ (Two tangents drawn from the same point to a circle are of equal length)
Now the perimeter of the triangle ΔABC,
⇒ AB + BC + AC = AB + AC + BP + CP
=(AB + BQ) + (AC + CR) = AQ + AR = 2 × AQ
So, we can say that AQ = $\frac{1}{2}$ × Perimeter

$= \frac{1}{2} \times (AB + BC + CA)$

Sol.39.(c)



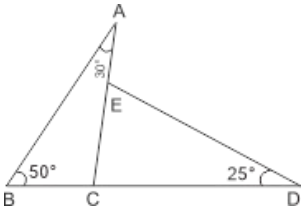
In $\Delta ABC, \angle A = 90^0$, AB= 6cm, AC =8cm. AD is perpendicular to BC,

⇒ $BC = \sqrt{AB^2 + AC^2} = 10$

⇒ $AD = \frac{AB \times AC}{BC} = \frac{6 \times 8}{10} = 4.8\ cm$

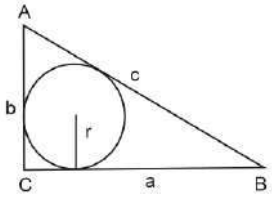
Sol.40.(c) as PQ || AC
∴ ∠QBC = ∠PQB = 70° (alternate interior angle), in △PBQ
∠PBQ = 180° - (70° + 70°) = 40°

Sol.41.(a)



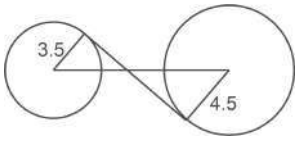
From the above diagram as ∠BAC = 30° and ∠ABC = 50°
∠BCA = 100° , ∠ECD = 80°
Again as ∠CDE = 25° ,
⇒ ∠CED = 100° - 25° = 75°
⇒ ∠AED = 180° - 75° = 105°

Sol.42.(b)



Radius(r) of circle = $\frac{(a+b-c)}{2}$

Sol.43.(b)



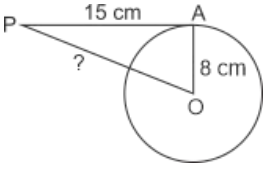
Transverse Tangent = $\sqrt{d^2 - (r_1 + r_2)^2}$

⇒ 6 = $\sqrt{d^2 - 64}$ ⇒ 36 = $d^2 - 64$

⇒ d^2 = 100 ⇒ d = 10 cm

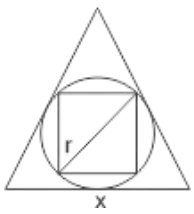
Sol.44.(a) exterior angle of the octagon = 180° - 135° = 45°

Sol.45.(b)



Here ΔAOP is a right angle triangle in which PO is hypotenuse.
Let, PO is x cm,
By using pythagoras formula
$PO^2 = PA^2 + AO^2 \Rightarrow x^2 = 15^2 + 8^2$
= 225 + 64 = 289 So, x= 17 cm

Sol.46.(d)



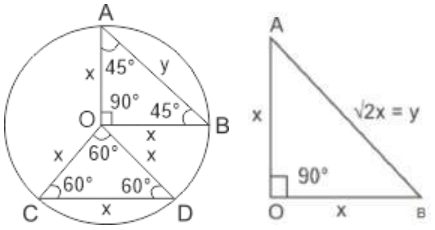
Inradius = r = $\frac{x}{2\sqrt{3}}$

Diameter of circle = diagonal of square

$\Rightarrow \frac{x}{\sqrt{3}} = \sqrt{2}a \Rightarrow a = \frac{x}{\sqrt{6}}$

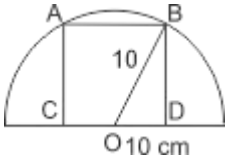
Area of square $= a^2 = \frac{x^2}{6}$

Sol.47.(a)



In Δ AOB , ∠ABO = 45° , ∠BAO = 45° and AOB = 90°, Now, y =$\sqrt{2}$x

Sol.48.(c)



Let side of square = 2a, OD = a

In ΔBOD,

$a^2 + 4a^2 = 100 \Rightarrow 5a^2 = 100$

$\Rightarrow a^2 = 20 \Rightarrow a = 2\sqrt{5}$, Side = $4\sqrt{5}$

Area of square = $(4\sqrt{5})^2 = 80\ cm^2$

Shortcut:-

Side of square = $\frac{2r}{\sqrt{5}} \Rightarrow a = \frac{20}{\sqrt{5}} = 4\sqrt{5}$

Area = 80 cm^2

Sol.49.(b)

Let interior angle and exterior angle = x and y respectively

A/Q, x - y = 140°

And we know that sum of interior and exterior angle = 180°

x + y = 180°

By solving both equations we get,

x = 160° and y = 20°

Number of sides = $\frac{360}{20}$ = 18

Sol.50.(b) The angle formed by the pages of a fully open book, with just a few pages, is theoretically a straight angle. The angle formed by the pages of an open book is an obtuse angle.

Sol.51.(b) 24 hr = 360°

$\frac{27}{5}$ hr = $\frac{360}{24} \times \frac{27}{5}$ = 81°

Sol.52.(c)

Length of arc = $\frac{\theta}{360} \times 2\pi R = 22$

$\Rightarrow \frac{\theta}{360} \times 2 \times \frac{22}{7} \times 100 = 22$

$\Rightarrow \theta = \frac{360 \times 7}{200} = \frac{63}{5} =$ 12° 36'

Sol.53.(a)

It's possible in equilateral triangle

In an equilateral triangle , all sides are equal to each other., (a = b = c)

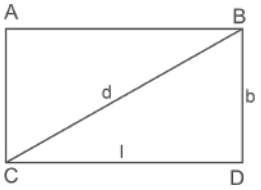
Sol.54.(c) Let the 3rd side = a

Third side of the triangle lies

10 - 4 < a < 10 + 4 ⇒ 6 < a < 14

Sol.55.(d)

Let , length = l , breadth = b , diagonal = d



Letting l > b In right angle triangle ABC,

$l^2 + b^2 = d^2$ ..... (1)

Given that: l + b - d = $\frac{l}{3}$

$\Rightarrow \frac{2}{3}$ l + b = d .....(2)

Putting the value of d in equation (1), we get: $= l^2 + b^2 = (\frac{2}{3}l + b)^2$

$\Rightarrow l^2 - \frac{4}{9}l^2 = \frac{4}{3}$lb

$\Rightarrow \frac{5}{9}l^2 = \frac{4}{3}$lb $\Rightarrow \frac{l}{b} = \frac{12}{5}$

Sol.56.(b) Equation of circle →

$x^2 + y^2 + 2gx + 2fy + c = 0$

Radius of circle (r^2) → $g^2 + f^2 - c$

Suppose θ is the angle between the circle

$x^2 + y^2 - 12x - 6y + 41 = 0$

And $x^2 + y^2 + kx + 6y - 59 = 0$

$g_1 = -6$, $f_1 = -3$, $c_1 = 41$

g_2 = k/2 , f_2 = 3 , c_1 = −59

Cosθ = $\frac{c_1 + c_2 - 2g_1g_2 - 2f_1f_2}{2r_1r_2}$, θ = 45°

Cos45°= $\frac{41 - 59 - 2(-6)\frac{k}{2} - 2(-3)3}{2\times\sqrt{36+9-41}\ \sqrt{\frac{k^2}{4}+9+59}}$

$\Rightarrow \frac{1}{\sqrt{2}} = \frac{-18 + 6k + 18}{2 \times 2 \times \sqrt{\frac{k^2}{4}+9+59}}$

$\Rightarrow \frac{1}{\sqrt{2}} = \frac{6k}{4 \times \sqrt{\frac{k^2}{4}+68}}$

Squaring and cross - multiplying

$\Rightarrow 4(\frac{k^2}{4} + 68) = 18k^2$

$\Rightarrow \frac{2(k^2+272)}{4} = 9k^2$

$\Rightarrow k^2 + 272 = 18k^2 \Rightarrow k^2 = 16 \Rightarrow k = \pm 4$

Sol.57.(a) 100% = 360°

100 -70% = 30% = $\frac{30 \times 360°}{100}$ = 108°

Sol.58.(c)

Distance between origin and $c_1 = 5\sqrt{2}$

Similarly the distance between origin and $c_2 = \sqrt{2}\ r_2$

according to the question

$5\sqrt{2} = 5 + \sqrt{2}\ r_2 + r_2$, $r_2(1 + \sqrt{2}) = 5\sqrt{2} - 5$

$r^2 = \frac{5\sqrt{2}-5}{(1+\sqrt{2})} = \frac{5(\sqrt{2}-1)}{(1+\sqrt{2})} \times \frac{\sqrt{2}-1}{\sqrt{2}-1}$

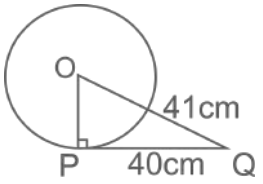
$= 5(3 - 2\sqrt{2})$

Sol.59.(c) The ratio of the perimeter of both triangles,

$\frac{perimeter\ of\ \Delta PQR}{perimeter\ of \Delta XYZ} = \frac{48}{24} = \frac{2}{1}$

$\therefore \frac{PQ}{XY} = \frac{2}{1} \Rightarrow \frac{PQ}{12} = \frac{2}{1} \Rightarrow$ PQ = 24 cm

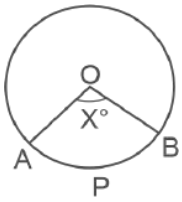
Sol.60.(c)



Radius of circle (OP)

$\rightarrow \sqrt{41^2 - 40^2} = \sqrt{81} = 9\ cm$

Sol.61.(c)

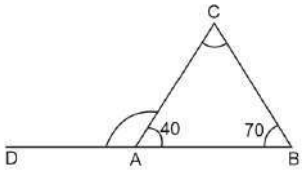


Area of the sector OAPB = $\frac{x}{360}\ \pi r^2$

ATQ, $\frac{x}{360}\ \pi r^2 = \frac{5}{18}\pi r^2$

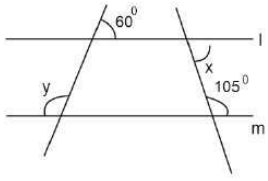
$\Rightarrow x = \frac{5}{18} \times 360 \Rightarrow x = 100°$

Sol.62.(c)



Exterior angle of A = 180° - 40° = 140°

Sol.63.(b)

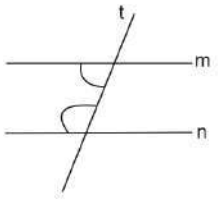


∠x = 180° - 105° = 75° and ∠y = 180° - 60° = 120°

The value of 2x + y = 2 × 75° + 120°

= 150° + 120° = 270°

Sol.64.(d)



A pair of interior angles on the same side of the transversal can't be of same measure.

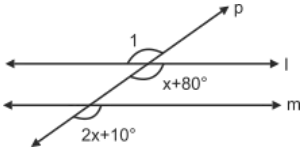
Sol.65.(c)
Interior angles of a regular polygon
$= \frac{(n-2)}{n} \times 180°$
$\frac{(n-2)}{n} \times 180 = 135°$
$180n - 360° = 135n$
$180n - 135n = 360°$
$45n = 360° \Rightarrow n = 8$
Polygon has 8 sides.

Sol.66.(d)
Each interior angle of a regular polygon
$= \frac{(n-2) \times 180}{n}$
$\frac{(n-2) \times 180}{n} = 160$
$\Rightarrow 180n - 360 = 160n$
$\Rightarrow 180n - 160n = 360$
$\Rightarrow 20n = 360 \Rightarrow n = 18$
Number of sides in the polygon = 18

Sol.67.(d) In ΔABC
∠A = 40° , ∠B = 55°
In ΔDEF
∠D = 55° , ∠E = 85°
Therefore ∠F = 40
m($\overline{AB}$) = m($\overline{FD}$)
By ASA triangles are congruent
ΔABC ≅ ΔFDE

Sol.68.(a) In triangle We know that ,
Sum of angles = 180°
⇒ third angle = 180° - (60° + 80°) = 40°

Sol.69.(a)



By corresponding angles ;
$x + 80 = 2x + 10$
$\Rightarrow 2x - x = 80 - 10 \Rightarrow x = 70°$
∠1 = x + 80 = 70° + 80° = 150°

Sol.70.(d) Properties of similar triangles ,
(i) Ratio of corresponding sides = Ratio of corresponding altitude
(ii) Ratio of corresponding sides = Ratio of corresponding perimeters
(iii) Ratio of corresponding sides = Ratio of corresponding medians
(iv) Ratio of any two angles ≠ Ratio of any two medians
So , option (d) is not a property of similar triangles.

Sol.71.(b)
Interior angle of regular polygon
$= \frac{n-2}{n} \times 180$
$\Rightarrow 120 = \frac{(n-2)180}{n}$
$\Rightarrow 180n - 360 = 120n$
$\Rightarrow 180n - 120n = 360$
$\Rightarrow 60n = 360 \Rightarrow n = 6$
Side of polygon = 6

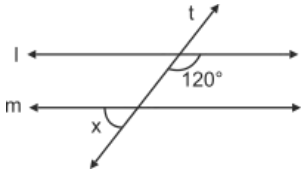
Sol.72.(b) 2 π R = Circumference of circle
$R = \frac{88 \times 7}{7 \times 44} = 2\ cm$
Now, perimeter of square = 4 × side
= 4 × 2 = 8 cm

Sol.73.(b) From the properties of similarity of triangles,
If corresponding sides of the two triangles are proportional and their corresponding angles are also equal then, two triangles are similar.

Sol.74.(a)
Sum of interior angles in polygon
= (n − 2) × 180° (where n = number of sides)
Now ,
(n − 2) × 180° = 2700° ⇒ n − 2 = 15
So , n = 17

Sol.75.(a) Let the angles of the quadrilateral are 2x , 3x , 5x , 6x .
2x + 3x + 5x + 6x = 360
$\Rightarrow 16x = 360 \Rightarrow x = 22.5$
Angles are:- 45° , 67.5° , 112.5° , 135°
All angles are unequal so, it can only be trapezium.

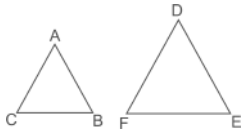
Sol.76.(c)



x = 180° - 120° = 60°

Sol.77.(b) Parallelogram whose all sides are equal but, diagonals are unequal that is only rhombus.

Sol.78.(c)



$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF} = \frac{1}{2}$
When BC = 8 cm then EF = 16 cm

Sol.79.(c) Exterior angles = $\frac{360°}{n}$, where n is the number of sides.
Exterior angles = $\frac{360°}{6} = 60°$

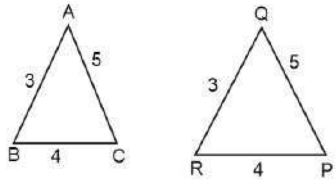
Sol.80.(c) Quadrilateral has 4 side, 4 vertex, 4 angles and 2 diagonals.
Hence, circle is not quadrilateral.

Sol.81.(b)
Let the angles of the quadrilateral be 3x , 5x , 4x and 6x
$3x + 5x + 4x + 6x = 360$
$\Rightarrow 18x = 360 \Rightarrow x = 20°$
∠p = 3x = 60° and ∠r = 4x = 80°
So , 3p + 2r = 3 × 60 + 2 × 80
= 180° + 160° = 340°

Sol.82.(d)
From the properties of parallel lines,
Sum of interior angles of the same side of the transversal is 180°
So , ∠1 = 35° then ∠2 = 180 - 35 = 145°

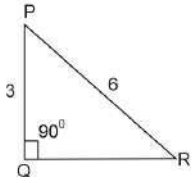
Sol.83.(a) Let the angles of the quadrilateral are 2x , 5x , 7x , 10x
$2x + 5x + 7x + 10x = 360$
$\Rightarrow 24x = 360 \Rightarrow x = 15$
Difference = $10x - 2x = 150° - 30° = 120°$

Sol.84.(d)



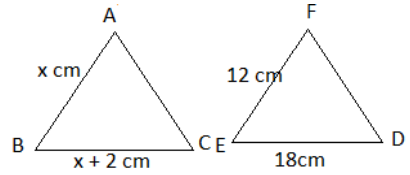
So, $\triangle BCA\ congruent\ to\ \triangle RPQ$

Sol.85.(d)



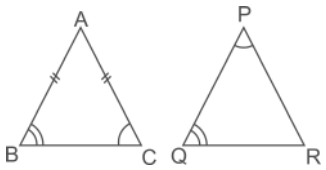
SinR = PQ/PR = $\frac{3}{6}$, $\angle PRQ = 30°$
[since, Sin 30° = $\frac{1}{2}$]

Sol.86.(a)



According to similarity,
$\frac{x}{x+2} = \frac{12}{18}$
⇒ 18x = 12x + 24 ⇒ 6x = 24 ⇒ x = 4 cm

Sol.87.(a)



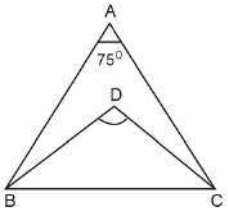
As AB = AC , so ∠B = ∠C
∠B = ∠Q and ∠C = ∠P .....(given)
From above conclusion , we get
∠P = ∠Q so , RP = RQ
Both triangles are isosceles triangles.
There is no relation between any side of two triangles.
Therefore , $\Delta ABC \ncong \Delta PQR$ (not congruent)

Sol.88.(a)

Exterior angle = $\frac{360}{n} = \frac{360}{8} = 45°$

Sol.89.(b) A rhombus is a special case of a parallelogram. In a rhombus, opposite sides are parallel and the opposite angles are equal. Moreover, all the sides of a rhombus are equal in length, and the diagonals bisect each other at right angles. So every square is a rhombus.

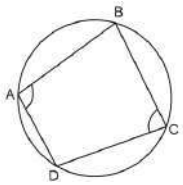
Sol.90.(c)



$\angle BDC = 90° + \frac{\angle A}{2} = 90° + 37.5°$
$= 127.5°$

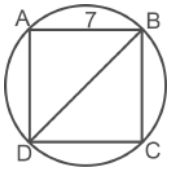
Sol.91.(b)
A square has all angles equal , all sides are equal , and two diagonals are equal.
So, only option a , c and d follow.

Sol.92.(b)



Let angle A and angle C are 3x and 7x.
$3x + 7x = 180 \Rightarrow 10x = 180 \Rightarrow x = 18$
Bigger angle = 7x = 18 × 7 = 126°

Sol.93.(d)



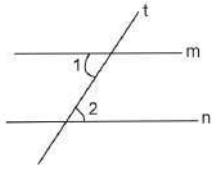
Side of the square = 7 cm, Diagonal of square = $\sqrt{2} \times side$ = $7\sqrt{2}$ cm
Now, Circumference of circle
= π × diameter = $\frac{22}{7} \times 7\sqrt{2} = 22\sqrt{2}\ cm$

Sol.94.(c)
Number of diagonals of polygon
= $\frac{n(n-3)}{2} \Rightarrow \frac{n(n-3)}{2} = 65$
$\Rightarrow n^2 - 3n - 130 = 0$
$\Rightarrow n^2 - 13n + 10n - 130 = 0$
$\Rightarrow (n - 13)(n + 10) = 0 \Rightarrow n = 13$
Sum of the interior angles = (n - 2) × 180
= (13 - 2) × 180 = 11 × 180 = 1980°

Sol.95.(d) Let the other two angles be x° and y° then third angle = x + y
x + y + (x + y) = 180
$\Rightarrow 2(x + y) = 180 \Rightarrow (x + y) = 90°$
Hence , a triangle is a right-angle triangle.

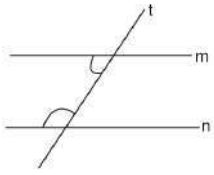
Sol.96.(d) The point of intersection of all the medians of a triangle is the centroid of the triangle. A median of a triangle is a line segment from one vertex to the midpoint on the opposite side of the triangle

Sol.97.(a)
From properties of parallel lines ,



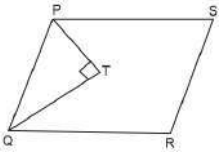
Alternate interior angles are equal ,
m∠1 = m∠2 = 35°

Sol.98.(c)



From the properties of parallel lines,
when a pair of parallel lines is intersected by a transversal then sum of interior angles on the same side of the transversal is 180°
Now ,
$7x + 3x = 180° \Rightarrow 10x = 180° \Rightarrow x = 18°$
Now difference between the angles
= 7x - 3x = 126° - 54° = 72°

Sol.99.(b)

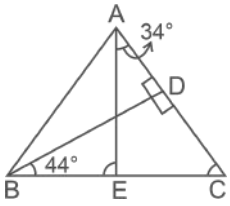


From properties of parallelogram,
$\angle PTQ = \frac{1}{2}(\angle P + \angle Q)$
$= \frac{1}{2} \times 180 = 90°$

Sol.100.(d)
Let the angles are 4x, 3x and 5x.
$4x + 3x + 5x = 180 \Rightarrow 12x = 180 \Rightarrow x = 15$
Hence, the angles are 60°, 45° and 75°

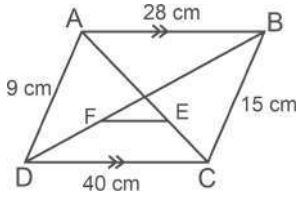
Sol.101.(c)
Exterior angle = $\frac{360}{n} \Rightarrow n = \frac{360}{40} = 9$

Sol.102.(b)



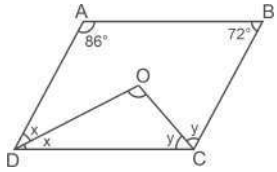
In ΔBDC , $\angle C = (180° - 44° - 90°) = 46°$
In ΔACE, $\angle AEC$ = (180° - 34° - 46°) = 100°
Now, $\angle AEB = 180° - 100° = 80°$
[Straight angles]

Sol.103.(d)



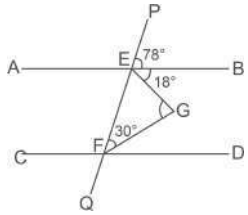
Length of EF = $\frac{Diff.\ b/w\ parallel\ lines}{2}$
$= \frac{40 - 28}{2} = \frac{12}{2} = 6\ cm$

Sol.104.(b)



ABCD is a quadrilateral, then ∠A + ∠B + ∠C + ∠D = 360
$\Rightarrow 86 + 72 + x + x + y + y = 360$
$\Rightarrow 2x + 2y = 360 - 158$
$\Rightarrow 2(x + y) = 202$
$\Rightarrow x + y = 101°$
Now in ΔCOD, $x + y + \angle DOC = 180$
$\Rightarrow \angle DOC = 180 - 101 = 79°$

Sol.105.(c)

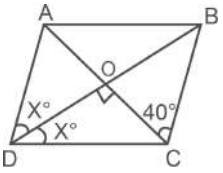


∠AEF = ∠PEB = 78°
(Vertically opposite angle)
∠PEB + ∠BEF = 180°
(linear pair)
∠BEF = 180 - ∠PEB = 180 - 78 = 102°

∠GEF = ∠BEF - ∠BEG = 102 - 18 = 84°
In triangle GEF,
⇒ ∠GEF + ∠EFG + ∠EGF = 180°
⇒ $84 + 30 + \angle EGF = 180°$
⇒ $\angle EGF = 180 - 114 = 66°$

Sol.106.(a) We know that sum of supplementary angles = 180°
So ,
3x – 5° + 80° = 180°
⇒ 3x = 105°
Therefore , x = 35°

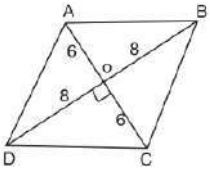
Sol.107.(b)



In triangle OCD ,
$\angle ODC = 180° - (90° + 40°) = 50°$
In rhombus, Diagonals are the angle bisectors of the angles.
So , $\angle ADB = 50°$

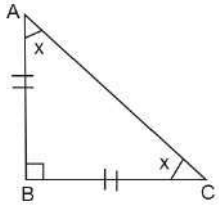
Sol.108.(d)
From properties of similar triangles,
$\frac{ar.\ of\ smaller\ triangle}{ar.\ of\ bigger\ triangle} = \left(\frac{2}{3}\right)^2$
Area of bigger triangle
$= \frac{9}{4} \times 48 = 108\ cm^2$

Sol.109.(b) D1 = 16 cm , D2 = 12 cm



As we know, Diagonals of rhombus bisect each other at 90° & make 4 equal right angle triangles.
So, According to pythagoras theorem (Right angle triangle $\triangle DOC$),
$hypotenuse^2 = perpendicular^2 + base^2$
Side of the rhombus
$= \sqrt{8^2 + 6^2} = \sqrt{64 + 36} = \sqrt{100} = 10\ cm$

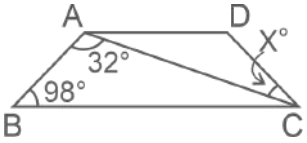
Sol.110.(b)



$\angle ABC + \angle BCA + \angle CAB = 180$
⇒ 90° + x + x = 180 (Since BA = BC = x)
⇒ $2x = 180 - 90 \Rightarrow 2x = 90 \Rightarrow x = 45°$
Hence, the angles of A and C are 45° and 45°

Sol.111.(c) Let the complementary angles are x° and (90 - x)°
Then, $x - (90 - x) = 24$
⇒ $x - 90 + x = 24$
⇒ $2x = 24 + 90 \Rightarrow 2x = 114 \Rightarrow x = 57°$
Hence, the greater angle is 57°

Sol.112.(c)



∠BAD + 98° = 180° (BC ‖ AD)
∠BAD = 82
So ∠CAD = 82 - 32 = 50°
In ΔADC
∠CAD = ∠CDA (AC = CD)
Therefore, x = ∠ACD = 180 – 50 – 50 = 80°

Sol.113.(d) Square : It is quadrilateral whose all four sides are equal and all the four internals angles are right angles. It is a special case of a rectangle.
Rectangle: It is a quadrilateral with four right angles. It can also be defined as an equiangular quadrilateral, since equiangular means that all of its angles are equal. It has opposite sides equal.
Rhombus: It is a quadrilateral whose four sides all have the same length. Another name is equilateral quadrilateral, since equilateral means that all of its sides are equal in length. Its diagonals intersect each other at 90 degrees.
Trapezium: It is a quadrilateral with a pair of opposite sides parallel.

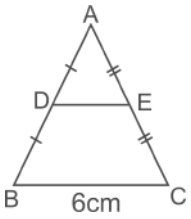
Sol.114.(c) A straight angle is an angle equal to 180 degrees. It looks like a straight line.

Sol.115.(a) When two lines are parallel then corresponding angles are equal
So, 6x + y = x + 5y
5x = 4y ⇒ x = $\frac{4y}{5}$
On a straight line sum of angles = 180°
So , 4x + 6x + y = 180°
10x + y = 180° .....(1)
By putting value of x in equation (1)
8y + y = 180° so, y = 20°
And x = $\frac{4 \times 20°}{5}$ = 16°
Then the value of 5x - y = 16° × 5 - 20° = 60°

Sol.116.(c) Angles opposite the equal sides of a triangle are always equal.

Sol.117.(d)
Each interior angle of a regular polygon = $\frac{180°(n-2)}{n}$
⇒ $\frac{180°(n-2)}{n} = 144°$
⇒ $180°n - 360° = 144n$
⇒ $180°n - 144°n = 360°$
⇒ $36°n = 360° \Rightarrow n = 10$
Hence, the polygon has 10 sides.

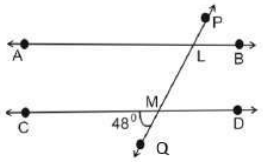
Sol.118.(b)



According to Thales theorem
$\Delta ADE \sim \Delta ABC$
$\frac{AD}{AB} = \frac{AE}{AC} = \frac{DE}{BC}$
$\frac{1}{2} = \frac{DE}{6}$
So , DE = 3cm

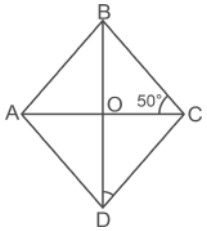
Sol.119.(d)
Parallel lines never intersect each other.

Sol.120.(b)



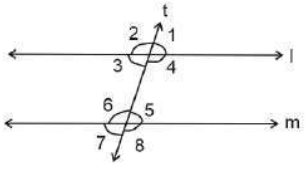
$\angle CMQ = 48°\ then, \angle LMD = 48°$
$(by\ vertically\ opposite\ angle)$
Now, $\angle LMD = \angle ALM = 48°\ (byalternate\ interior\ angles)$
Hence,
$\angle PLA$ =180°–48° = 132° (straight angle)

Sol.121.(c)



Diagonals of rhombus bisect each angle
So , $\angle ACB = \angle ACD = 50°$
Now , In triangle OCD ,
∠ACD + ∠COD + ∠BDC = 180°
⇒ $50° + 90° + \angle BDC = 180°$
⇒ $\angle BDC = 180° - 140° \Rightarrow \angle BDC = 40°$

Sol.122.(c)

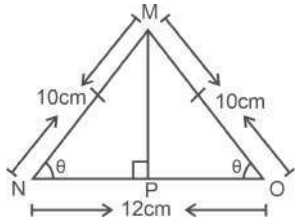


Ratio of ∠1 and ∠2 = 4 : 11
$4x + 11x = 180$
⇒ $15x = 180 \Rightarrow x = 12$

$\angle 1 = 48°$, and $\angle 2 = 132°$
$\angle 7 = \angle 3 = \angle 1 = 48°$
$\angle 8 = \angle 4 = \angle 2 = 132°$

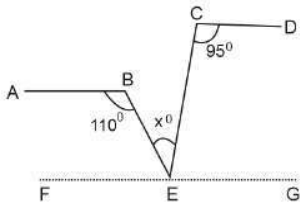
Sol.123.(b) Let $\angle A$ and $\angle C$ be 4x and 3x
$\angle A + \angle B + \angle C + \angle D = 360°$
$\Rightarrow 4x + 3x + 150 = 360°$
$\Rightarrow 7x = 360° - 150°$
$\Rightarrow 7x = 210° \Rightarrow x = 30°$
$\angle C = 3x = 30° \times 3 = 90°$

Sol.124.(a)



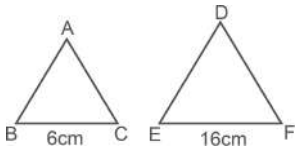
The altitude from the apex of an isosceles triangle bisects the base into two equal parts
$\angle N = \angle O$
So, MN = MO
Hence MP bisects NO at P
Now, PO = $\frac{12}{2}$ = 6 cm
By pythagoras,
length of MP = $\sqrt{10^2 - 6^2}$ = 8cm

Sol.125.(a)



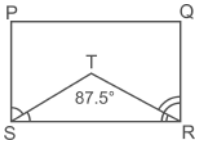
When two line are parallel then, sum of interior angle on same side = 180°
So , $\angle ABE + \angle FEB = 180°$
$\angle FEB = 180° - 110° = 70°$
And ,
$\angle ECD = \angle CEF$ (alternate angle)
$95° = x° + \angle FEB$
By putting value of $\angle FEB$
So , $x° = 95° - 70° = 25°$

Sol.126.(d)



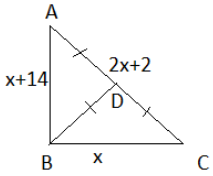
if two triangles are similar, then their corresponding angles are equal and corresponding sides are in equal proportion.
Therefore CA : FD ⇒ 6 : 16 = 3 : 8

Sol.127.(c)



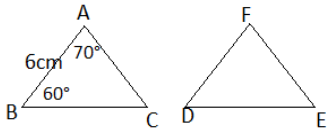
In quadrilateral,
$\angle RTS = \frac{\angle P + \angle Q}{2}$
So , $\angle P + \angle Q$ = 87.5 × 2 ⇒ 175°
$\angle P : \angle Q$ = 2 : 3 (given)
Now $\angle P + \angle Q$ (5 unit) → 175°
1 unit → $\frac{175°}{5}$ = 35 °
Therefore ,
Difference between $\angle P$ and $\angle Q$ (1 unit)
→ 35°

Sol.128.(c) Let the triangle ABC is right angle triangle and BD is the median to the hypotenuse
In right angled triangle BD = AD = DC
ATQ,
BC = x, hypotenuse (AC) = 2x + 2
And AB = $\frac{2x+2}{2}$ + 13 = x + 14



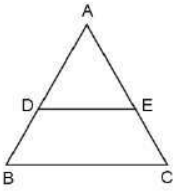
By pythagoras,
$(2x + 2)^2 = x^2 + (x + 14)^2$
$\Rightarrow 4x^2 + 4 + 8x = x^2 + x^2 + 196 + 28x$
$\Rightarrow 2x^2 - 20x - 192 = 0 \Rightarrow x^2 - 10x - 96 = 0$
$\Rightarrow x^2 - 16x + 6x - 96 = 0$
$\Rightarrow x(x - 16) + 6(x - 16) = 0$
$\Rightarrow (x + 6)(x - 16) = 0$
x = 16 , - 6
Therefore BD = $\frac{AC}{2}$ = $\frac{2 \times 16 + 2}{2}$ = 17

Sol.129.(b) $\Delta ABC \cong \Delta FDE$
ATQ ,



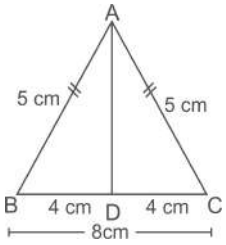
$\angle C = 180° - 60° - 70° = 50°$
When two triangles are congruent then All three pairs of corresponding sides and angles are equal.
DF = 6cm and $\angle E = 50°$ satisfies the facts
So, option (b) is the correct answer.

Sol.130.(d)



Given AD = 7 cm, AE = 3.5 cm and BD = 6 cm
From the properties of similar triangle = $\frac{AD}{AB} = \frac{AE}{AC}$
$\Rightarrow \frac{7}{13} = \frac{3.5}{AC} \Rightarrow AC = \frac{13 \times 3.5}{7} = 6.5\ cm$

Sol.131.(d)



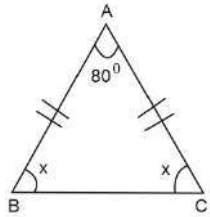
In an isosceles triangle , altitude drawn at its base bisect the base.
Now, from pythagoras theorem, AD
= $\sqrt{25 - 16} = 3\ cm$
Area of triangle = $\frac{1}{2} \times base \times height$
$= \frac{1}{2} \times 8 \times 3 = 12\ cm^2$

Sol.132.(a) Let the smallest angle be x
$x + 2x + 3x = 180$
$\Rightarrow 6x = 180 \Rightarrow x = 30$
Greatest angle = 3x = 3 × 30 = 90°

Sol.133.(c)
From the properties of parallel lines,
When two parallel lines are intersected by a transversal then sum of the interior angles formed on the same side of the transversal = 180°

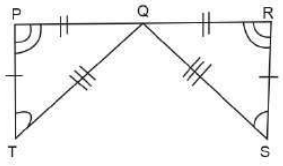
Sol.134.(a) In an isosceles triangle, two sides are equal in length.
$4x - 2 = 7 - x$
$\Rightarrow 4x + x = 7 + 2 \Rightarrow 5x = 9 \Rightarrow x = 1.8$

Sol.135.(a)



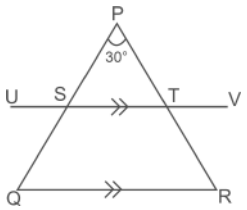
$80° + x + x = 180 \Rightarrow 2x = 180 - 80$
$\Rightarrow 2x = 100 \Rightarrow x = 50°$
Hence, the measure of both the base angles = 50 °

Sol.136.(b) From the below diagram



Here, QR = PQ , PT = RS and QT = QS
Then , $\Delta QRS \cong \Delta QPT$

Sol.137.(a)



$\frac{PS}{PQ} = \frac{PT}{PR}$ ....(Thales Theorem)

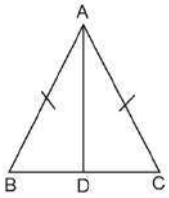
ST $\neq \frac{QR}{2}$ ..... (as S and T are not midpoint)

$\Delta PST \approx \Delta PQR$ as ∠P common angle

∠S = ∠Q and ∠T = ∠R

.....(corresponding angle)

Sol.138.(a)

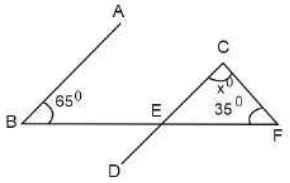


We know,

ABC is an isosceles triangle. So, AD will be a bisector of angle A.

So, option (a) is correct.

Sol.139.(c)



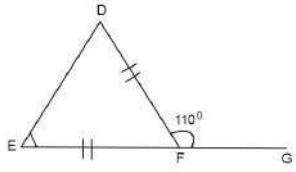
∠ABE = ∠CEF = 65°

In ΔCEF,

∠C + ∠E + ∠F = 180°

x° + 65° + 35° = 180° ⇒ x° = 80°

Sol.140.(c)



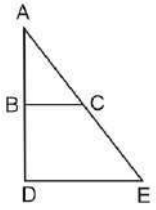
Since, DF = EF , ∠DEF = ∠FDE

Now, exterior angle = sum of the two interior angles

∠DEF + ∠FDE = 110°

∠DEF +∠DEF = 110°, then ∠DEF = 55°

Sol.141.(a)



From the properties of similar triangles,

$\frac{AB}{AD} = \frac{BC}{DE}$

Sol.142.(b) The sum of the two adjacent angles of a parallelogram is 180°

Let one of the angle be x° and the other angle = $\frac{2}{3}x$

$\frac{2}{3}x + x = 180$

$\Rightarrow \frac{5}{3}x = 180 \Rightarrow x = 108°$

Hence, the smaller angle = 180 - 108 = 72°

Sol.143.(a)

Sum of quadrilateral angle = 360°

According to question,

⇒ 120° + x° + x° + x° = 360°

⇒ 3x° = 240° ⇒ x° = 80°

So , required answer = 80°

Sol.144.(b) Sum of all angles of a quadrilateral is 360°

Let the fourth angle be x

90 + 96 + 88 + x = 360

$\Rightarrow x + 274 = 360$

$\Rightarrow x = 360 - 274 = 86°$

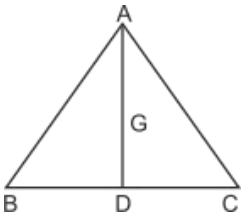
Hence, the fourth angle is 86°

Sol.145.(a) Area of the equilateral triangle

$= \frac{\sqrt{3}}{4} \times side^2 \Rightarrow \frac{\sqrt{3}}{4} \times side^2 = 25\sqrt{3}$

$\Rightarrow side = \sqrt{25 \times 4} = 10\ cm$

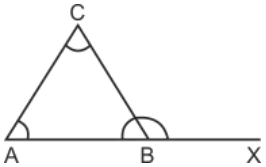
Sol.146.(b)



The centroid of the triangle separates the median in the ratio of 2 : 1.

Therefore AG : GD = 2 : 1

Sol.147.(c)



Let the angles are A,B and C are 3x , 4x and 5x.

$3x + 4x + 5x = 180$

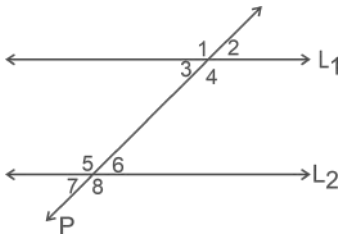
$\Rightarrow 12x = 180 \Rightarrow x = 15$

So, A = 45° , B = 60° and C = 75°

Now, angle CBX =∠A + ∠C = 45 + 75

= 120° .....(exterior angle is the sum of the two opposite interior angles).

Sol.148.(c)



Angle 4 = 5x + 35 (given)

Angle 7 = angle 6 = 45°

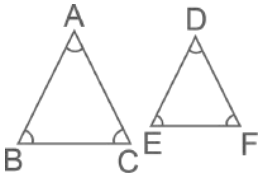
And, angle 6 + angle 4 = 180°

$\Rightarrow 45 + 5x + 35 = 180$

$\Rightarrow 5x = 180 - 80$

$\Rightarrow 5x = 100 \Rightarrow x = 20°$

Sol.149.(b)



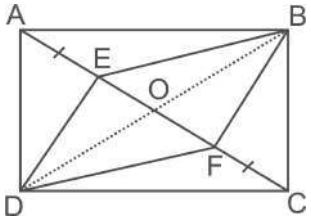
Given, AB = 6.5cm, DE = 3.9 cm and BC = 5.15 cm

From the properties of similar triangles ,

$\frac{AB}{BC} = \frac{DE}{EF}$

$\frac{6.5}{5.15} = \frac{3.9}{EF} \Rightarrow EF = \frac{3.9 \times 5.15}{6.5}$ = 3.09 cm

Sol.150.(d)



ABCD is a parallelogram and AE = CF

Join BD , meet AC at point O.

Since, diagonals of a parallelogram bisect each other.

∴ OA = OC

and OD = OB

Now, OA = OC

and AE = CF [Given]

⇒ OA − AE = OC − CF ⇒ OE = OF

Thus, BFDE is a quadrilateral whose diagonals bisect each other.

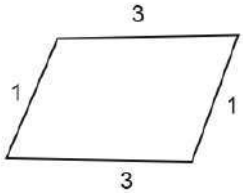
Hence, BFDE is a parallelogram.

Sol.151. (c) Octagon has 8 sides

Exterior angle = $\frac{360}{8}$ = 45°

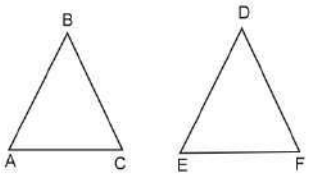
Interior angle = 180° - 45° = 135°

Sol.152.(c)



In the parallelogram the opposite sides are equal .

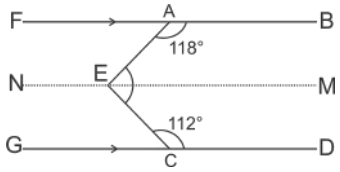
Sol.153.(a)



If all the three sides of one triangle are equivalent to the corresponding three sides of the second triangle, then the two triangles are said to be congruent by SSS (side- side - side) rule.
In the above given figure, AB = DE ,
AC = EF and BC = DF
Hence, ΔABC ≅ Δ EDF

Sol.154.(b) In rhombus ,
We know that,
4 side² = $D_1^2 + D_2^2$
⇒ 4 × 20² = 30² + D_2^2
⇒ D_2^2 = 1600 - 900 ⇒ D_2^2 = 700
Hence, $D_2 = 10\sqrt{7}$

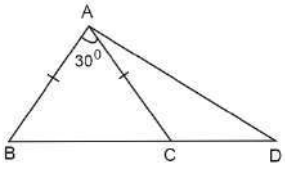
Sol.155.(b) FB II GD



∠BAE = 118°
∠DCE = 112°
∠AEM = 180° - 118° = 62°
∠MEC = 180° - 112° = 68°
∠AEC = 62° + 68° = 130°
$\frac{1}{2}$∠AEC = $\frac{1}{2}$ × 130° = 65°

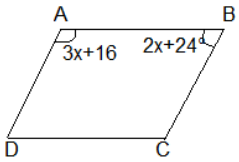
Sol.156.(b) ΔABC ~ ΔQPR
$\frac{area\ of\ \Delta ABC}{area\ of\ \Delta QPR} = \frac{(AC)^2}{(QR)^2}$
$\frac{3}{2} = \frac{9^2}{QR^2}$
$\frac{3}{2} = \frac{81}{QR^2}$
QR² = 54 ⇒ QR = 3√6

Sol.157.(b)



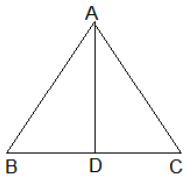
AB = AC
Sum of three angles of a triangle = 180°
∠ABC = ∠ACB = $\frac{180° - 30°}{2}$ = 75°
∠ACD = 180° - 75° = 105°

Sol.158.(c)



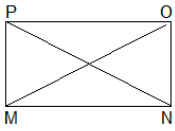
We know,
In parallelogram, sum of two adjacent angles = 180°
3x + 16° + 2x + 24° = 180°
5x + 40° = 180° ⇒ 5x = 140° ⇒ x = 28°
∠A = 3x + 16° = 3 × 28 + 16 = 100°
∠A = ∠C = 100° (in parallelogram , opposite angles are equal)
⇒ ∠C = 100°

Sol.159.(d)



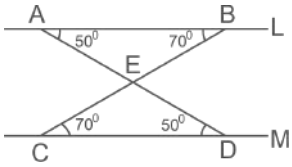
BC = 7 cm, BD = 4 cm
DC = 7 - 4 = 3 cm
By angle bisector theorem,
$\frac{AB}{AC} = \frac{BD}{DC}$
$\frac{AB}{4.2} = \frac{4}{3}$ ⇒ AB = 5.6

Sol.160.(b)



MN = PO and PM = ON
All angles are 90°
Also, diagonals don't intersect at 90°
So , the given quadrilateral will be Rectangle.

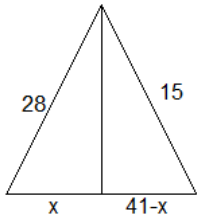
Sol.161.(d) Given, l ∥ m , m∠EAB = 50° and m∠ECD = 70°



And we know that if two lines are parallel then their alternate interior angles are equal.
So from this ∠A = ∠D = 50° and ∠B = ∠C = 70°
And we know that the exterior angle of a triangle equals the sum of its opposite interior angles.
Hence ∠E = ∠C + ∠D or ∠A + ∠B
⇒ ∠E = 70°+ 50° ⇒ ∠E = 120°

Sol.162.(d) Perimeter of pentagon = 5a = 5 × (2a) = 10a cm

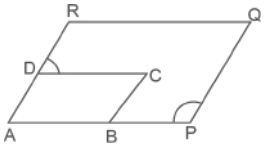
Sol.163.(d) Perimeter of triangle = 84
41 + 28 + third side = 84
Third side = 15



$28^2 - x^2 = 15^2 - (41 - x)^2$
$784 - x^2 = 225 - (1681 + x^2 - 82x)$
$784 - x^2 = 225 - 1681 - x^2 + 82x$
784 - 225 + 1681 = 82x
82x = 2240 ⇒ x = 27.3
By pythagoras theorem ,
Length of altitude = $\sqrt{(28)^2 - (27.3)^2}$
= 6.15 (approx)

Sol.164.(b) ΔABC ~ ΔDEF
$\frac{AB}{DE} = \frac{BC}{EF}$
$\frac{6}{8} = \frac{BC}{10}$ ⇒ BC = 7.5
Again ,
$\frac{AB}{DE} = \frac{AC}{DF}$
$\frac{6}{8} = \frac{AC}{14}$ ⇒ AC = 10.5
Perimeter of ΔABC = AB + BC + CA
= 6 + 7.5 + 10.5 = 24

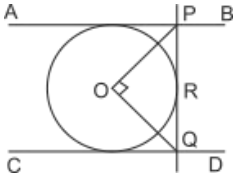
Sol.165.(b)



∠APQ = 100°
Sum of the adjacent angles of parallelogram = 180°
So, ∠RAP = 180° - ∠APQ = 80°
Now, ∠RAP = ∠RDC
= 80° (corresponding angles)

Sol.166.(a) ΔABC ~ ΔADE
$\frac{Area\ of\ ADE}{Area\ of\ ABC} = (\frac{AD}{AB})^2$
$\frac{Area\ of\ ADE}{Area\ of\ ABC} = (\frac{3}{5})^2 = \frac{9}{25}$
According to question,
9 unit = 18
25 unit = 50
So , area of triangle = 50 cm²

Sol.167.(b)



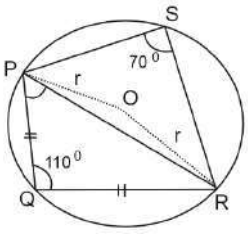
In this figure ∠ $POQ\ is\ always\ 90°$ (**Theorem)**

Sol.168.(a) ∠PQR : ∠PSR = 11 : 7
∠PQR + ∠PSR = 180°

$\angle PQR = \frac{11}{11+7} \times 180 = 110°$

As PQ = QR,

$\angle QPR = \angle QRP = \frac{180 - 110}{2} = 35°$



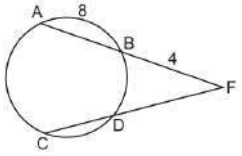
$\angle POR = 2\angle PSR = 2 \times 70° = 140°$ ..... (angle formed by an arc at centre is twice the angle formed by same arc at circumference)

In △POR, PO = OR = radius

$\angle OPR = \angle ORP = 20°$

Now, $\angle OPQ = \angle OPR + \angle RPQ = 20° + 35° = 55°$

Sol.169.(a)



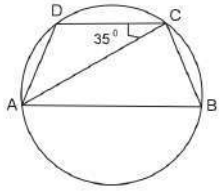
We know,

FB × AF = FD × FC

4 × 12 = x × 16 ⇒ x = 3

CD = 16 - 3 = 13

Sol.170.(b)



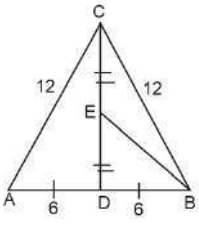
$\angle ACD = 35°$

$\angle ACB = 90°$ (Angle made by diameter at circumference = 90°)

$\angle BCD = 90° + 35° = 125°$

$\angle BAD = 180° - 125° = 55°$

Sol.171.(c)



We know,

The angle bisector of an equilateral triangle bisects the opposite side into two equal parts and also makes 90° at the point of intersection.

AB = BC = AC = 12 cm, AD = DB

In ΔCDB,

$CB^2 = CD^2 + DB^2 \Rightarrow 12^2 = CD^2 + 6^2$

$144 - 36 = CD^2 \Rightarrow CD = 6\sqrt{3}$

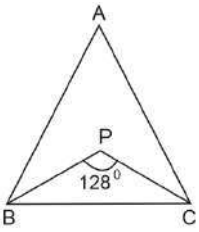
$ED = \frac{6\sqrt{3}}{2} = 3\sqrt{3}$

In ΔEDB,

$BE^2 = (3\sqrt{3})^2 + 6^2$

$BE^2 = 27 + 36 \Rightarrow BE = 3\sqrt{7}$

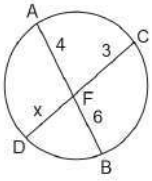
Sol.172.(c)



$\angle BPC = 90° + \frac{\angle A}{2}$

$128° = 90° + \frac{\angle A}{2} \Rightarrow \angle A = 76°$

Sol.173.(b)



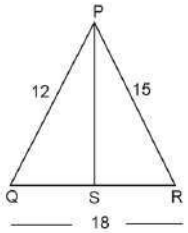
We know,

AF × FB = FC × FD

4 × 6 = 3 × FD ⇒ FD = 8

CD = 3 + 8 = 11

Sol.174.(a)



By angle bisector theorem,

$\frac{PQ}{QS} = \frac{PR}{SR}$

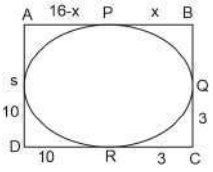
$\frac{12}{x} = \frac{15}{18 - x}$

216 - 12x = 15x

27x = 216 ⇒ x = 8

So, length of SR = 18 - 8 = 10 cm

Sol.175.(c)



PB = BQ = x and AP = AS = 16 - x

Perimeter of the quadrilateral ABCD = AB + BC + CD + DA

=10 + 10 + 6 + 32 + 2x - 2x = 58

Sol.176.(b) Height of equilateral triangle

(h) = $\frac{\sqrt{3}}{2}$ × side

Side of the equilateral triangle

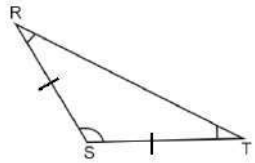
$= 12 \times \frac{2}{\sqrt{3}} = 8\sqrt{3}$

Perimeter of the triangle

$= 8\sqrt{3} + 8\sqrt{3} + 8\sqrt{3} = 24\sqrt{3}\ cm$

Sol.177.(c) ΔRST is an obtuse isosceles triangle so RS = ST

$\angle R = \angle T = 16°$

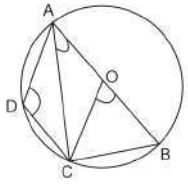


$\angle S = 180° - 16° \times 2 = 180° - 32° = 148°$

Sol.178.(a)

Given,$\angle ADC = 129°$

then $\angle ABC = 180 - 129 = 51°$

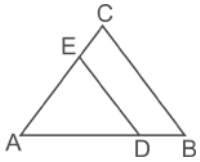


In triangle OCB, $\angle OCB = \angle OBC = 51°$, then, $\angle BOC = 180 - 102 = 78°$

$\angle BAC = \frac{78}{2} = 39°$

Sol.179.(b)

In the following diagram :



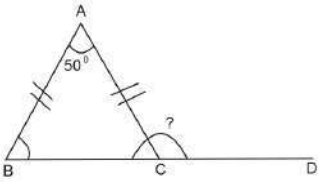
$\Delta AED \sim \Delta ACB$ [similar triangle]

$\Rightarrow \frac{\overline{AD}}{\overline{AB}} = \frac{\overline{AE}}{\overline{AC}} \Rightarrow \frac{x}{x+x-2} = \frac{x+2}{x+2+x-1}$

$\Rightarrow 2x^2 + 4x - 2x - 4 = 2x^2 + x$

$\Rightarrow x = 4$

Sol.180.(d) ΔABC is an isosceles triangle so AB= AC therefore $\angle ABC = \angle ACB = x$

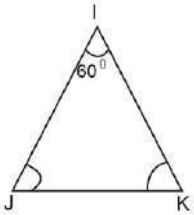


$x + x + 50 = 180 \Rightarrow 2x = 130 \Rightarrow x = 65°$

$\angle ACD = \angle BAC + \angle ABC$

$= 50° + 65° = 115°$

Sol.181.(d)



$\angle IJK = \angle IKJ = 60°$

Required %

$= \frac{120° - 60°}{120°} = \frac{60°}{120°} \times 100 = 50\%$

Sol.182.(d) The angles of a triangle are 2x°, (3x° - 8°) and (5x° - 12°).

As we know, the sum of interior angles of a triangle = 180°

⇒ 2x°+ (3x° - 8°) + (5x° - 12°) = 180°

⇒ 10x° = 200° ⇒ x° = 20°

So, the greatest angle of the triangle

= (5x° - 12°) = 100° - 12° = 88°

Sol.183.(d) As we know, In a rhombus the sum of adjacent angles are supplementary i.e.,

$\angle A + \angle B = 180°$

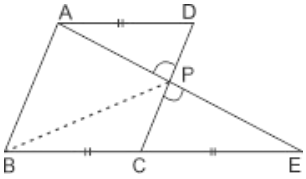
Here the adjacent angles of a rhombus are in the ratio of 3 : 6

Then the smallest angle of the rhombus is = $\frac{3}{9} \times 180° = 60°$

Sol.184.(d) Circumradius of equilateral triangle (R) = $\frac{a}{\sqrt{3}}$

⇒ R = $\frac{\sqrt{3}}{\sqrt{3}}$ = 1 unit

Sol.185.(c)



In ΔAPD and ΔEPC,

$\overline{AD} = \overline{CE}$, ∠APD = ∠CPE and

∠ADP = ∠ECP

⇒ So, $\Delta APD \simeq \Delta EPC$

Then

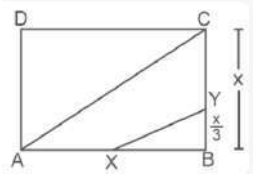
ar. □ABCD = ar. □ABCP + ar. ΔADP)

or ar. □ABCD = ar. □ABCP + ar. ΔCPE)

Hence,

ar. □ABCD = ar. ΔABE

Sol.186.(b)



From the above diagram, area of ΔBXY

$= \frac{1}{2} \times \frac{x}{2} \times \frac{x}{3} = \frac{1}{12}x^2$

Given, ⇒ 300 = $\frac{1}{12}x^2$

i.e. x = 60 So, the diagonal of the square

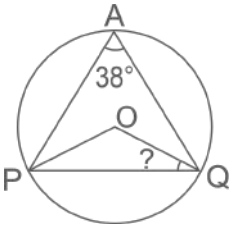
= $x\sqrt{2}$ = $60\sqrt{2}$

Sol.187.(c) The area of △ PQR = 16 × △ ABC

⇒ side of △ PQR = 4 × side of △ ABC

= 4 × 28 = 112 cm

Sol.188.(c)



In the given figure, PO and OQ are the radii of the circumcircle of triangle ΔAPQ,

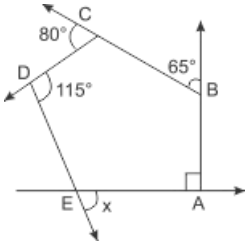
If angle ∠PAQ = 38°

then, ∠POQ = 2 × ∠PAQ = 76°

Now as $\overline{PO} = \overline{OQ}$ ⇒ ∠OPQ = ∠PQO,

So, ∠PQO = $(\frac{180° - 76°}{2}) = \frac{104°}{2}$ = 52°

Sol.189.(b)



As we can see ABCDE is a pentagon.

Sum of the interior angles of the pentagon ABCDE = 540°

Now, $\angle DCB$ = 100°, $\angle CBA$ = 115°,

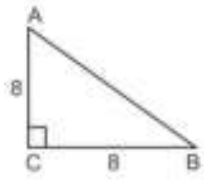
$\angle BAE$ = 90° and $\angle CDE$ = 115°

⇒ $\angle AED$ = 540°- (100°+115°+90°+115°)

= 540°- 420° = 120°

⇒ ∠x = 180°- 120° = 60°

Sol.190.(d)

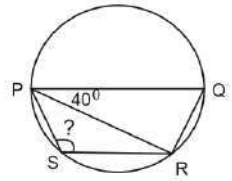


△ABC is an isosceles triangle in which $\angle C = 90^0$, AC = 8 cm ⇒ CB = 8 cm.

We know, $AC^2 + CB^2 = AB^2$

⇒ $AB^2 = 8^2 + 8^2 \Rightarrow AB = 8\sqrt{2}cm$

Sol.191.(a)



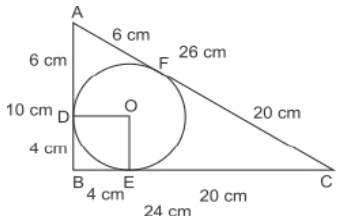
Given that, PQ is a diameter. Therefore PR ⊥ RQ, ∴ ∠PRQ = 90°

Now, ∠PQR = 180° - (90°+ 40°) = 50°

∠PSR + ∠PQR = 180°

∴ ∠PSR = 180°- 50°= 130°

Sol.192.(d)

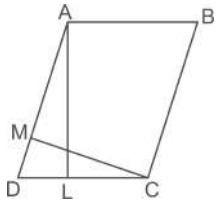


Radius of circle = OD = BE = 4cm

Short Tricks :- Inradius(r)

= $\frac{P + B - H}{2} = \frac{10 + 24 - 26}{2} = \frac{8}{2}$ = **4 cm**

Sol.193.(b)



In the parallelogram ABCD. AL and CM are perpendicular to CD and AD respectively.

AL = 20 cm, CD = 18 cm and CM = 15 cm.

As we know the area of parallelogram = base×height

⇒ $\overline{CD} \times \overline{AL} = \overline{AD} \times \overline{CM}$

⇒ $\overline{AD} \times 15 = 18 \times 20 \Rightarrow \overline{AD} = 24$

So, the perimeter of the parallelogram is

= 2 × $(\overline{AD} + \overline{CD}) = 2 \times (24 + 18) = 84$ cm.

Sol.194.(b) Concept : The opposite angles of a Parallelogram are equal .

According to the question,

⇒ ∠B = ∠D ⇒ (7x - 30)° = 5x°

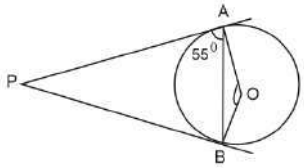
⇒ 2x° = 30° ⇒ x = 15°

Sol.195.(a)

3, 4 , 5 makes triplets so the triangle formed will be a Right angled triangle.

Sol.196. (b) KQ = 20.4 × $\frac{4}{17}$ = 4.8 cm

Sol.197.(c)



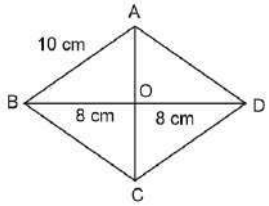
PA = PB ∴ ∠ PAB = ∠ PBA = 55°

∠ BAO = 90°- 55° = 35°

And ∠ ABO = 90°- 55 = 35°

∴∠ AOB = 180°- (35°+ 35°) = 110°

Sol.198.(c)



AO = $\sqrt{10^2 - 8^2}$ = 6 cm

Area of rhombus = 4 × area of Δ AOB

= 4 × $\frac{1}{2}$ × 8 × 6 = 96 cm^2

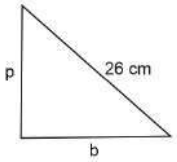
2nd method:-

AC = 2 × 6 = 12 cm

Area of rhombus = $\frac{1}{2}d_1d_2$

= $\frac{1}{2}$ × 16 × 12 = 96 cm^2

Sol.199.(c)



Given that perimeter = 60 cm

∴ p + b + 26 = 60 ⇒ p + b = 34

And, $p^2 + b^2 = 26^2$

$(p + b)^2 = p^2 + b^2 + 2pb$

⇒ $34^2 = 26^2 + 2pb$ ⇒ $2pb = 34^2 - 26^2$

⇒ 2pb = 1156 - 676 = 480

∴ pb = 240

Area of Δ = $\frac{1}{2}pb = \frac{1}{2}$ × 240 = 120 cm^2

Alternate method:

Given that perimeter = 60 cm

∴ p + b + 26 = 60 ⇒ p + b = 34

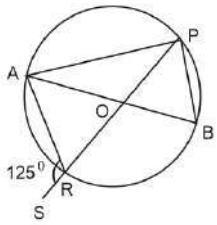
Now, we know the triplet: 10, 24, 26

So, p × b = 10 × 24

Now, Area of Δ

= $\frac{1}{2}pb = \frac{1}{2}$ × 10 × 24= 120 cm^2

Sol.200.(b)



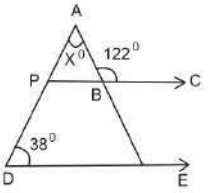
In the above diagram, as ∠ARS = 125^o, so

∠ARP = 55^o = ∠ABP;

Again we know, ∠APB = 90^o,

So, ∠PAB = $(90^o - 55^o) = 35^o$

Sol.201.(a)



Let us extend the line CB upto P on the line AD.

Now, ∠APB = 38^0(BC || DE) & ∠ABP

= $(180^0 - 122^0) = 58^0$

So, ∠PAB = $\{180^0 - (38^0 + 58^0)\} = 84^0$

Sol.202.(a) The length of a rectangle is 2 m less than thrice its breadth.

⇒ $l = 3b - 2$, Again, $2(l + b) = 28$

⇒ $2(3b - 2) + 2b = 28$

⇒ $8b = 32 \Rightarrow b = 4$

Sol.203.(a) Given that b = 12 cm

A/Q, h - p = 6

⇒ h = 6 + p , $b^2 + p^2 = h^2$

⇒ 144 + p^2 = $(6 + p)^2$

⇒144 + p^2= 36 + 12p + p^2

⇒ 108 = 12p ⇒ p = 9 And, h = 6 + 9 = 15

Perimeter = 12 + 9 + 15 = 36 cm

Sol.204.(b)

Length of the three sides of △ ABC are 6 cm, 4 cm and 9 cm. Another △DEF is similar to △ ABC ⇒ △ ABC~△DEF .

That means the ratio of the sides of △ ABC = the ratio of the sides of △DEF = 6 : 4 : 9 ;

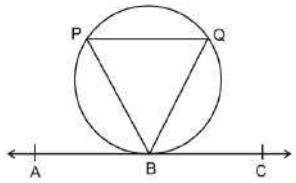
Now one side of △DEF is equal to 36 cm.

So, to find the greatest possible perimeter we have to take the smallest side of △DEF to be 36 cm ⇒ 4 units equivalent to 36 cm.

i.e 6 units equivalent to 54 cm and 9 units equivalent to 81 cm.

The greatest possible perimeter of △DEF = (36 + 54 + 81) = 171 cm.

Sol.205.(d)



As we know from the Angles of Alternate Segment of Circle :

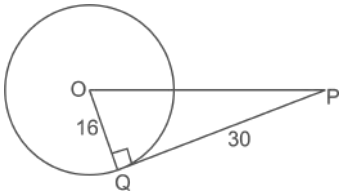
∠QBC = ∠BPQ = 72°

Again ∠BQP = ∠BPQ ;

So, ∠PBQ = {180° - (∠BPQ + ∠BQP)}

= (180°- 144°) = 36°

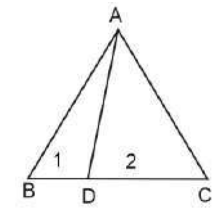
Sol.206.(b)



OP = $\sqrt{(30)^2 + (16)^2} = \sqrt{900 + 256}$

= $\sqrt{1156}$ = 34 cm

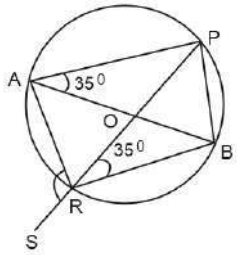
Sol.207.(b)



Height is same so area will depend on base only

Area of ΔABC = $\frac{3}{2}$ area of ΔADC

Sol.208.(a)



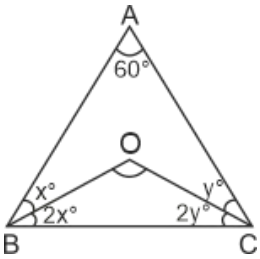
∠PRB = 35° (angle made by same chord)

∠ARB = 90° (Angle made by diameter)

∠ARP = 90 - 35 = 55°

∠ARS = 180- 55 = 125°

Sol.209.(d)



Let $\angle OBA$ = x° and $\angle OCA$ = y°

∴ $\angle OBC$ = 2x° and $\angle OCB$ = 2y°

In ΔBOC,

$\angle OBC + \angle BCO + \angle BOC$ = 180°

$\angle BOC$ = 180° - 2 (x° + y°) ..... (eq, 1)

Now , In ΔABC,

$\angle ABC + \angle BCA + \angle BAC$ = 180°

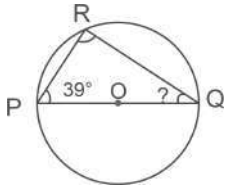
3x° + 3y° + 60° = 180°

x° + y° = 40° ..... (eq, 2)

Putting the value of (eq, 2) in (eq, 1)

$\angle BOC$ = 180° - 2 (40°) ⇒ $\angle BOC$ = 100°

Sol.210.(a)

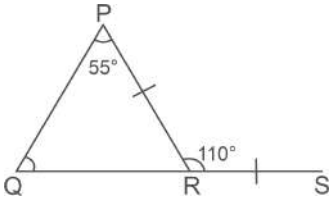


$\angle PRQ$= 90° (angle made by diameter is always 90°)

$\angle RQP$ + 39° + 90° = 180°

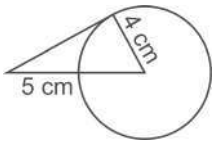
⇒ $\angle RQP$ = 180° - 129° =51°

Sol.211.(a)



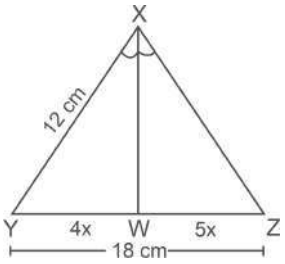
∠PRQ = 180° - 110° = 70°
Now, ∠PQS + 55° + 70° = 180°
∠PQS = 180° - 125° = 55°

Sol.212.(d)



Length of tangent = $\sqrt{5^2 - 4^2}$ = 3 cm

Sol.213.(b)

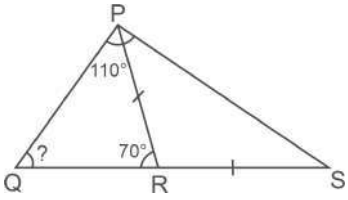


YW = $\frac{4}{9}\times$ 18 = 8 cm And WZ = 10 cm

XW is angle bisector

$\frac{XY}{XZ} = \frac{YW}{WZ} \Rightarrow \frac{12}{XZ} = \frac{8}{10} \Rightarrow$ XZ = 15 cm

Sol.214.(b)

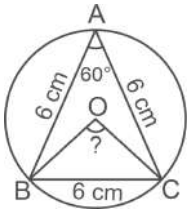


∠PRS = 180° - 70° = 110°
Given that PR = RS

∴ ∠RPS = ∠PSR = $\frac{(180° - 110°)}{2}$ = 35°

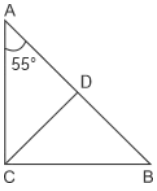
Now, ∠QPR = 110° - 35° = 75°
∠PQS = 180° - (75° + 70°) = 35°

Sol.215.(d)



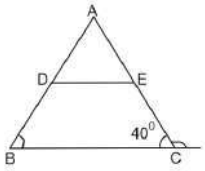
∠BOC = 2 × 60° = 120°

Sol.216.(a)



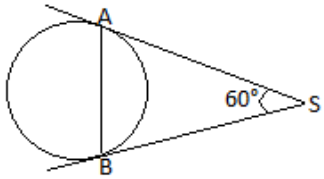
We know that , sum of all angles in the triangle is equal to 180°.
In triangle ACD, we have
∠ADC + ∠ACD + ∠DAC = 180°
90° + ∠ACD + 55° = 180° ⇒ ∠ACD = 35°

Sol.217.(d)



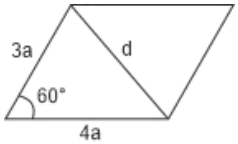
△ADE ~ △ABC (by AAA) [$since,\ DE \parallel BC$]
So, ∠ADE = ∠ABC, ∠AED = ∠ACB and ∠DAE = ∠BAC
∠AED = ∠ACB= 40° (corresponding angle) ⇒ In △ADE,
m∠DAE + m∠ADE= 180- ∠AED
⇒ m∠DAE + m∠ADE = 180°- 40° = 140°

Sol.218.(a)



SA = SB (Tangents on a circle from the same point)
∠SAB = ∠SBA
⇒∠ASB + ∠SAB + ∠SBA = 180°
⇒60° + ∠SAB + ∠SAB = 180°
⇒2∠SAB = 120° ⇒ ∠SAB = 60°
⇒ ∠SAB = ∠SBA = 60°
It means, ΔSAB is an equilateral triangle.
SA = SB = AB ⇒ SA = 12 cm (given)
AB = 12 cm.

Sol.219.(a)



Using Cosine Rule :-
$d^2 = (3a)^2 + (4a)^2 - 2 \times 3a \times 4a \times \cos 60°$
$d^2 = 9a^2 + 16a^2 - 12a^2$
$d^2 = 13a^2 \Rightarrow d = \sqrt{13}a$

Sol.220.(d) The ratio between sides of two regular polygons = 1 : 2
Let , side for $polygon_1$ = $1x$, side for $polygon_2$ = $2x$
each interior angle of the first polygon =140°
Exterior angle of first polygon =180°-140° = 40° (sum of Interior and Exterior angle is equal to 180°)
Number of side of first polygon($1x$)
= $\frac{360°}{40°}$ = 9,
Number of side of second polygon($2x$) = 18
Exterior angle of second polygon
= $\frac{360°}{18}$=20°
Interior angle of second polygon
= 180° - 20° = 160°

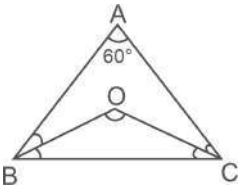
Sol.221.(a) Since it is a parallelogram the sum of adjacent angles = 180°
Let the smallest angle of the parallelogram=x°
⇒Then the other angle=(2x - 18°)
⇒ x° + (2x - 18)° =180°⇒x = 66°
And the second angle
= 2 × 66 – 18 = 114°
So the largest angle is 114°

Sol.222.(c) Sum of int. + ext. =180°
Diff of int. - ext = 60°
Interior angle > ext. Angle
Exterior angle = 60°
Now, Exterior angle = $\frac{360°}{no.\ of\ sides}$
no. of sides = $\frac{360°}{60}$ = 6

Sol.223.(d) Sum of angles of quadrilateral = 360°
⇒ $4x + 9x + 11x + 12x = 360°$
⇒ $36x = 360° \Rightarrow x = 10°$
Largest Angle(12x) = $120°$

Sol.224.(a) Let the interior angle = α
And exterior angle = β
A/Q, $\alpha - \beta = 36°$----- (1)
$\alpha + \beta = 180°$ ----- (2)
On solving equation (1) and (2), we get
$\alpha = 108°\ and\ \beta = 72°$
Exterior angle of regular polygon = $\frac{360°}{n}$
⇒ no. of sides (n) = $\frac{360}{72} = 5$

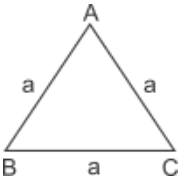
Sol.225. (a)



Bisector formula:
When bisector of angle B and C meet at inside of triangle at point 'O'
Then
$\angle O = 90° + \frac{\angle A}{2}$ = 90° + 30° = 120°

Sol.226.(b)
Sum of angles of a triangle = 180°
(2 + 3 + 4) unit = 180° ⇒ $9\ unit = 180°$
⇒1 unit = 20°
Difference of largest and smallest number → 2 units ⇒ $2 \times 20° = 40°$

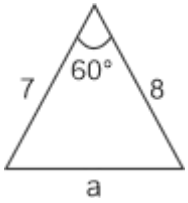
Sol.227.(d)



The perimeter of an equilateral triangle
$= 36\sqrt{3} \Rightarrow 3a = 36\sqrt{3} \Rightarrow a = 12\sqrt{3}$
Now for height, applying Pythagoras
$H^2 = (12\sqrt{3})^2 - (6\sqrt{3})^2 = 18$ m

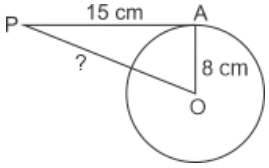
Sol.228.(c) S = (3 + 6 + 5) ÷ 2 = 7
The area of the triangle formed by the medians = $\sqrt{7(7-3)(7-6)(7-5)}$
$= \sqrt{7 \times 4 \times 1 \times 2} = \sqrt{56}$
Area of the triangle = $\frac{4}{3}$ × Area of triangle formed by the medians
Area of the triangle = $\frac{4}{3}\sqrt{56}\ cm^2$

Sol.229.(d)



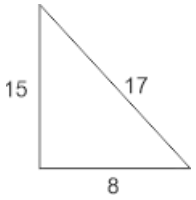
Applying cosine rule in the given Δ
$\cos\theta = \frac{(7)^2 + (8)^2 - a^2}{2 \times 7 \times 8}$
$\text{Cos } 60° = \frac{49 + 64 - a^2}{112} \Rightarrow \frac{1}{2} = \frac{113 - a^2}{112}$
$112 = 226 - 2a^2 \Rightarrow a = \sqrt{57}$

Sol.230.(b)



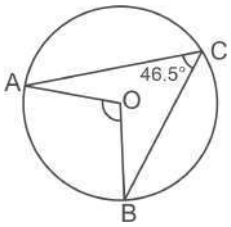
Here ΔAOP is a right angle triangle in which PO is hypotenuse.
Let, PO is x cm,
By using pythagoras formula
$PO^2 = PA^2 + AO^2 \Rightarrow x^2 = 15^2 + 8^2$
= 225 + 64 = 289
So, x= 17 cm

Sol.231.(b)



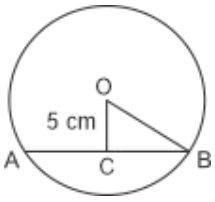
Sol.232.(a)
Perimeter of rhombus = Perimeter of rectangle = 2(34 + 18) = 104 cm
Side of rhombus = $\frac{104}{4} = 26$
Area of rhombus = $26 \times 26 \times \sin 120°$
$= 26 \times 26 \times \frac{\sqrt{3}}{2} = 338\sqrt{3}cm^2$

Sol.233.(c)



$\angle AOB = 2 \times 46.5 = 93°$

Sol.234. (a)



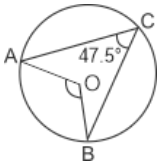
length of the chord (AB) = 24 cm
so that , BC = 12, In Δ COB
OB = $\sqrt{12^2 + 5^2}$ = 13 cm

Sol.235.(b) Given , Relation of the there angle = 2∠A = 3∠B = 6∠C
∠A :∠B :∠C = 3 : 2: 1
We know that , Sum of the angle is equal to 180° ⇒ 3x + 2x + x = 180°⇒ x = 30°,
Now , ∠C = x = 30°

Sol.236.(d)

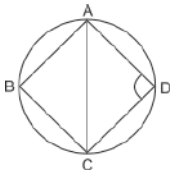
From distance formula,
AB=$\sqrt{(3-1)^2 + (4-2)^2}$
$= \sqrt{4+4} = \sqrt{8} = 2\sqrt{2}$
BC = $\sqrt{(4-3)^2 + (1-4)^2}$
$= \sqrt{1+9} = \sqrt{10}$
AC = $\sqrt{(4-1)^2 + (2-1)^2}$
$= \sqrt{9+1} = \sqrt{10}$, BC = AC
So ABC is an isosceles triangle.

Sol.237.(b)



$\angle AOB = 2 \times 47.5 = 95°$

Sol.238.(b)

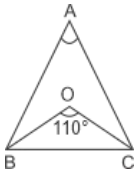


$\angle ABC = 60°(equilateral\ triangle)$
∠CDA = 180 - 60 = 120°

Sol.239.(c) Perimeter of rectangle
= 2 (3 + 4) = 14 unit
14 unit = 42 cm ⇒ 1 unit = 3 cm
Sides are 9 cm and 12 cm
Diagonal of rectangle
$= \sqrt{9^2 + 12^2} = \sqrt{81 + 144}$
$= \sqrt{225} = 15\ cm$

Sol.240.(a)
Perimeter of equilateral triangle = 36 m
Each Side of triangle = $\frac{36}{3} = 12\ m$,
Area of triangle = $\frac{\sqrt{3}}{4} \times 12 \times 12$
$= 36\sqrt{3}m^2$

Sol.241.(b)

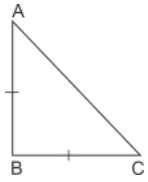


$\angle BOC = 90 + \frac{A}{2} \Rightarrow 110° = 90° + \frac{\angle BAC}{2}$
$\Rightarrow \angle BAC = (110° - 90°) \times 2 = 40°$

Sol.242.(b) $2\pi R = 360°$
$\Rightarrow 2 \times \frac{22}{7} \times 28 = 360°$
$\Rightarrow 22 = \frac{360 \times 7}{2 \times 28} = 45°$

Sol.243.(b) Sum of angles of a pentagon
= 180 × (5 - 2)= 540°
Each angle = $\frac{540}{5} = 108°$
Sum of angles of octagon
$= 180 \times (8-2) = 1080°$
Each angle of octagon = $\frac{1080}{8} = 135°$
Required Ratio = $\frac{108}{135} = \frac{4}{5}$

Sol.244.(b)



Base = height = h
Area = $\frac{1}{2} \times h^2 = 81 \Rightarrow h = 9\sqrt{2}$
AC = $\sqrt{(9\sqrt{2})^2 + (9\sqrt{2})^2}$
$= \sqrt{162 + 162} = \sqrt{324} = 18\ cm$

Sol.245.(c) Let the smallest angle = x
Then , the largest angle will be = 180° - x
But , the same equals to (2x -39°)
Sum of All angles of parallelogram = 360°
x + x + (2x - 39°) + (2x - 39°) = 360°
⇒ X = 73°

Sol.246.(c) The sum of two complementary angles = 90°
The sum of two supplementary angles = 180°
Given , one complementary angle = 15° , so that another angle = 90° - 15° = 75°
One supplementary angle = 125° , so that another angle = 180° - 125° = 55°
Then the sum of another angles
= 75° + 55° = 130°

Sol.247.(b)
Ratio between angles of triangle
∠A : ∠B : ∠C
=(x + 12°) : 4x : x
In a triangle , sum of all angle = 180°
Now , (x + 12°) + 4x + x = 180°
6x + 12° = 180° ⇒ x = 28°
So, ∠A = 40° , ∠B = 112° , ∠C = 28°

Sol.248.(b) Let the angles are x and y
x + y = 155°, x - y = 90°
On solving both equations we get,
x = 122.5° = $\frac{122.5\pi}{180} = \frac{49\pi}{72}$

Sol.249.(c) Sum of all angles of a pentagon = 180(5 - 2) = 540°
Sum of 4 angles
=70 + 110 + 135 + 95 = 410°
5th angle = 540 - 410 = 130°

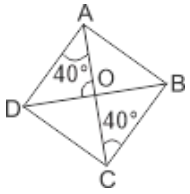
Sol.250.(d)
Given length = 35cm, $\theta = 60^0 = \frac{\Pi}{3}$rad
we know that, Radius
r = $\frac{l}{\theta} = \frac{35 \times 3}{\Pi} = \frac{105}{\Pi}$.

Sol.251.(c) Let the smaller angle = x
Larger angle = 5x - 20
A/Q, x + 5x - 20 = 100°
⇒ 6x = 120° ⇒ x = 20°
Larger angle = $5 \times 20 - 20 = 80°$

Sol.252.(d)
The angle does not change with its arm length.

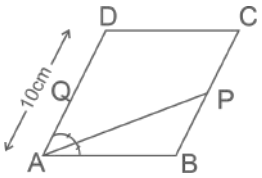
Sol.253.(d) Total number of triangle = 8
Sum of the angle in a triangle = 180°
Now, the sum of all angles of all triangles = 8 × 180° = 1440°

Sol.254.(b)



In the given rhombus ∠ACB = ∠CAD = 40°
In triangle ADO
∠ADO + ∠DOA + ∠OAD = 180°
∠ADO + 40°+ 90° = 180°
∠ADO = 50° = ∠ADB

Sol.255.(c)

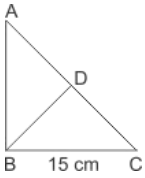


Given , ∠BAP =∠DAP and AD = 10 cm
AD = BC so that , BP = PC = $\frac{AD}{2}$= 5 cm
ABCD is a parallelogram
BP = PC (P is the mid point of side BC)
⇒∠BAP =∠DAP(given)
⇒ $\angle DAP = \angle APB$(alternate interior angle)
⇒ $\angle BAP = \angle APB$
⇒ $BA = BP$ (side opposite to equal angle)
So, $BA = BP$ = CD = 5 cm (Opposite side of parallelogram are equal)

Sol.256.(c)
Area of circumcircle of an equilateral triangle = $\frac{\pi a^2}{3}$
Area of incircle of an equilateral triangle = $\frac{\pi a^2}{12}$
According to question
⇒ $\frac{\pi a^2}{3} - \frac{\pi a^2}{12}$ = 66
⇒ $\pi a^2(\frac{1}{3} - \frac{1}{12}) = 66$
⇒$\pi a^2 \times \frac{1}{4} = 66$
⇒ $a^2 = \frac{66 \times 4 \times 7}{22} = 84$
Area of an equilateral triangle
= $\frac{\sqrt{3}}{4} a^2 = \frac{\sqrt{3}}{4} \times 84 = 21\sqrt{3}\ cm^2$

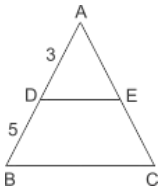
Sol.257.(c) Given
, ratio of the area (triangle) = 4x : 3x
Ratio of the height = 3x : 4x
For 1st triangle ,
Area = $\frac{1}{2}$ base$_1$ × 3x = 4x
$Base_1 = \frac{8}{3}\ unit$
For 2nd triangle = $\frac{1}{2}$ base$_2$ × 4x = 3x
$Base_2 = \frac{3}{2}\ unit$
Base$_1$: base$_2$ = 16 : 9

Sol.258.(c)



Given , AB = 8 cm and BC = 15 cm
AC = $\sqrt{(AB)^2 + (BC)^2} = \sqrt{15^2 + 8^2}$ = 17 cm
Now applying this formula , AB × BC = AC × BD ⇒ 8 × 15 = 17 × BD
⇒ BD = $7\frac{1}{17}$ cm

Sol.259.(a)



AE = $\frac{3}{8} \times 4 = 1.5\ cm$

Sol.260.(b)
Area of the equilateral triangle = $\frac{\sqrt{3}}{4}a^2$
= $\frac{\sqrt{3}}{4} \times 4 = \sqrt{3}\ cm^2$
Area = $\frac{1}{2} \times b \times h = \sqrt{3}$
⇒ $h = \frac{2\sqrt{3}}{2} = \sqrt{3}\ cm$

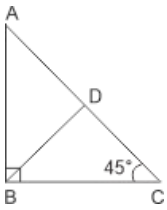
Sol.261.(c) In any triangle, the sum of any two angles of the triangle is greater than the measure of the third angle.

Sol.262.(b) The sum of medians is less than the perimeter in a triangle.

Sol.263.(a) $\triangle XYZ\ and\ \triangle LMN$ are similar
Ratio of perimeter = ratio of sides
$\frac{48}{32} = \frac{XY}{12} \Rightarrow XY = \frac{48 \times 12}{32} = 18\ cm$

Sol.264.(b) Ratio of bases = 4 : 5
Ratio of Area = 8 : 15
Ratio of altitude = $\frac{8}{4} : \frac{15}{5} \Rightarrow 2 : 3$

Sol.265.(a)

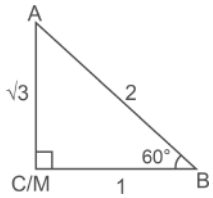


AB = BC ⇒ $AC^2 = 2AB^2$
⇒ $(4\sqrt{2})^2 = 2AB^2 \Rightarrow 32 = 2AB^2$
⇒ $AB^2 = 16 \Rightarrow AB = 4$

We know that
AB × $BC = BD \times AC$
⇒ $4 \times 4 = BD \times 4\sqrt{2}$
⇒ $BD = \frac{4}{\sqrt{2}}$units = $2\sqrt{2} units$

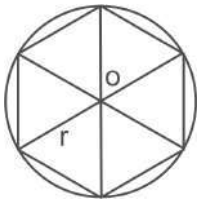
Sol.266.(c)
From the given statements it is clear that all the given statements are true.

Sol.267.(a)



A = 30° , B = 60° and C = 90°
So point C coincide with M
⇒ $\frac{BM}{AB} = \frac{1}{2}$

Sol.268.(b) Since we know that a circumcircle which is circumscribed a regular hexagon touches its each corner, and from the center to the corner the line drawn is the radius of the circle.
Hence it is ultimately an equilateral triangle. So each side will be 9 cm.

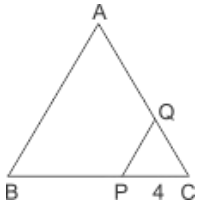


Sol.269.(a) Number of sides
= $\frac{360}{exterior\ angle} = \frac{360}{36}$ = 10.

Sol.270.(a) $\frac{135}{360} = \frac{3}{8}$

Sol.271.(a)
Angle A will be equal to the angle C , both are opposite angles of a parallelogram
x + 20° = 3x - 10° ⇒ 2x = 30° ⇒ x = 15°

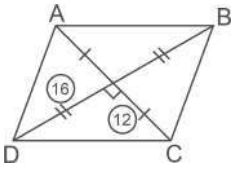
Sol.272.(a)



AB ‖ PQ
⇒ $\frac{CQ}{QA} = \frac{CP}{PB} \Rightarrow \frac{1}{3} = \frac{4}{PB}$
PB = 12 ⇒ BC = 12 + 4 = 16

Sol.273.(d)
Two intersecting circles are said to be orthogonal if the angle between them is a right angle.

Sol.274.(b)

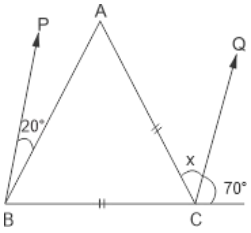


The length of the diagonals of a rhombus are 32 cm and 24 cm.
Using pythagoras theorem ,
In ΔDOC ⇒ DC= $\sqrt{16^2 + 12^2} = 20$ cm.
In rhombus , all sides are equal .

Sol.275.(a) The radius of the circle = 21 cm The circumference of a circle = perimeter of an equilateral triangle
2πr = 3a ⇒ 2 × $\frac{22}{7}$ × 21 = 3a ⇒ 132 = 3a
Side of the equilateral triangle = 44 cm

Sol.276.(b)
The sum of the angles of the various sections in a pie diagram is = 360°

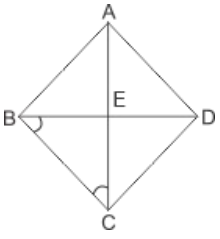
Sol.277.(d)



BP II CQ ∴∠PBC = 70°
∠ ABC = 70° - 20° = 50°, AC = BC
∠ABC = ∠BAC = 50°
∠ACB = 180° - 100° = 80°
Now,
X = 180° - 70° -80° = 30°

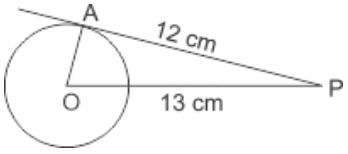
Sol.278.(b) ∠A + ∠B = 180°
∠B = 180° - 45° = 135°

Sol.279.(b)



Given , ABCD is a rhombus .∠ECB = 5a + 4 and ∠EBC = 4a + 5
In ΔBEC , ∠ECB + ∠EBC = 90°
⇒ (5a + 4) + (4a + 5) = 90°
⇒ 9a + 9 = 90° ⇒ a = 9°
Hence , ∠EBC
= 4a + 5 = 4 × 9° + 5 = 36 + 5 = 41°

Sol.280.(a)



Given , PA = 12 cm , PO = 13 cm and AO = radius of the circle
By the using of pythagoras law
AO = $\sqrt{13^2 - 12^2} = \sqrt{25}$ = 5 cm

Sol.281.(d)
Let the length and breadth of the rectangular field = 6x and 5x
A/Q,
2(6x + 5x) = 110
⇒ $22x = 110 \Rightarrow x = 5$
Breadth = 5x = 5 × 5 = 25

Sol.282.(c) ∠A + ∠B = ∠C
In any triangle sum of angles = 180°
∠A + ∠B + ∠C = 180°, ∠C + ∠C = 180°
2∠C = 180° , ∠C = 90°

Sol.283.(a) number of sides
= $\frac{360°}{exterior\ angle} = \frac{360°}{(180° - 165°)}$ = 24

Sol.284.(d) Given , AP = 12 cm , CP = 8 cm , DP = 6 cm, AP × PB = CP × PD
12 × PB = 8 × 6 , PB = $\frac{48}{12}$ = 4
AB = 12 - 4 = 8 cm
Radius = $\frac{8}{2} = 4cm$

Sol.285.(d) Opposite of $\angle O$
= (360° - 88°) ÷ 2 = 136°

Sol.286.(a)
Sum of angles of a triangle = 180°
Sum of remaining two angles
= 180° - 75° = 105°
Sum of two angles must be equal to or greater than 3rd angle
Least value of Smallest angle
= 105° - 75° = 30°

Sol.287.(a) Sum of interior angles of hexagon = 180 ×(6 - 2)
= 180 × 4 = 720°

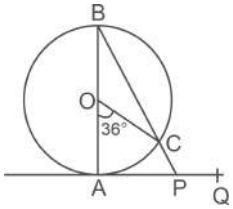
Sol.288.(c) Given, Radius of triangle (R) = 9 cm
And the radius of the triangle (r) = 4 cm
Distance between circumcentre and center of triangle = $\sqrt{R^2 - 2Rr}$
= $\sqrt{9^2 - 2 \times 9 \times 4}$ = 3cm

Sol.289.(c) $\frac{AB}{AC} = \frac{BD}{DC}$
It means that AD is angle bisector of angle A
So, ∠BAD = ∠ DAC = 28°
∠ABC = 180° - 60° - 56° = 64°

Sol.290.(b) ABC is a right angled triangle because angle A is the angle formed by diameter.
Area of ΔABC

$= \frac{1}{2} \times 16 \times 20 = 160\ cm^2$

Sol.291.(c)

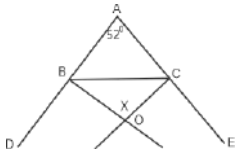


$\angle ABC = \frac{1}{2} \times \angle AOC = 18°$

$\angle ABP = \angle ABC = 18° \Rightarrow \angle BAP = 90°$

$\angle BPQ = 18° + 90° = 108°$

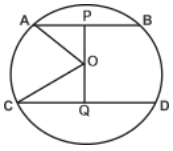
Sol.292.(c)



Given , $\angle BAC = 52°$, BO and CO are the angle bisectors of $\angle DBC$ and $\angle BCE$

Now , $\angle X = (90° - \frac{52°}{2}) = (90° - 26°) = 64°$

Sol.293.(a)



AB = 6cm and AP = 3cm

CD = 8cm and CQ = 4 cm

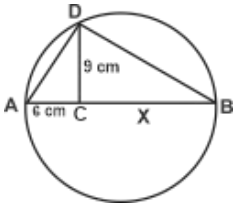
Let PO = x cm and OQ = 7 - x cm

Applying pythagoras theorem in both the triangle

radius^2 = 4^2 + (7 - x)^2 = 3^2 + x^2

On solving x = 4 cm and radius = 5cm

Sol.294.(d)



In ΔDCB

$BD^2 = DC^2 + CB^2 \Rightarrow BD^2 = 9^2 + x^2$ --- (i)

In ΔADC

$AD^2 = DC^2 + CA^2 \Rightarrow AD^2 = 9^2 + 6^2 = 117$

In ΔADB

$AD^2 + BD^2 = AB^2$

$\Rightarrow 117 + 81 + x^2 = (6 + x)^2$

$\Rightarrow 189 + x^2 = 36 + x^2 + 12x \Rightarrow x = 13.5$ cm

Hence , AB = 6 + x = 6 + 13.5 = 19.5 cm

Sol.295.(d)

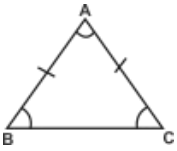
AC will be the diameter of the circle

$AC = \sqrt{3^2 + 4^2} = \sqrt{9 + 16} = \sqrt{25} = 5cm$

Radius of the circle = $\frac{5}{2}\ cm$

Sol.296.(b) Statement 1 and 2 is true.

Sol.297.(a)



$\angle B = \angle C$ (AB = AC)

$\angle A = 2\angle B$

Sum of angles = 180°

$\angle A + \angle B + \angle C = 180°$

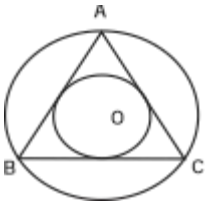
$\Rightarrow 2\angle B + \angle B + \angle B = 180° \Rightarrow 4\angle B = 180°$

$\Rightarrow \angle B = 45°$, $\angle C = 45°$

Sol.298.(d)

The sum of the consecutive angles of a parallelogram is equal to 180°

Sol.299.(c)



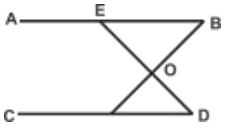
Given , sides of the triangle : 3 cm , 4 cm and 5 cm

Radius of in-circle = $\frac{3+4-5}{2} = 1\ cm$

Radius of circumcircle = $\frac{5}{2} = 2.5\ cm$

Ratio = $\frac{1}{2.5}$ = 2 : 5

Sol.300.(c)



Given ,

AB and CD are parallel lines , $\angle CDO = 70^o$ and $\angle DOB = 100^o$

We construct a line between o and E

In this figure - $\angle CDO = \angle OEB = 70^o$

In this figure - $\angle EOB + \angle DOB = 180^o$

$\Rightarrow \angle EOB = 80^o$

Now, In triangle EOB

$\angle EOB + \angle EB0 + \angle BEO = 180^o$

$\Rightarrow 80^o + \angle EB0 + 70^o = 180^o$

$\Rightarrow \angle EB0 = 180^o - 150^o = 30^o$

$\Rightarrow \angle EB0 = \angle AB0 = 30^o$

Sol.301.(b) Given , CP = 3cm and DP = 8

We know , CP × DP = AP × BP

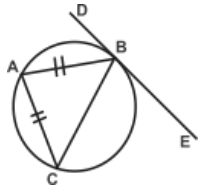
$\Rightarrow 3 \times 8 = AP \times BP \Rightarrow AP \times BP = 24$

For Possible value of AB

AP × BP	AP + BP = AB
24	
(6 × 4)	10
(12 × 2)	14
(24 × 1)	15

Hence , AB ≠ 20 cm (can not possible)

Sol.302.(d)

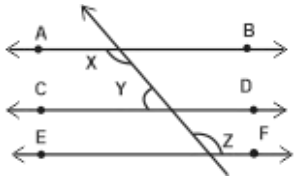


In the above diagram as $\overline{AB} = \overline{AC}$. and $\angle ABC = 65^o$;

Then $\angle ABC = \angle ACB = 65^o$;

So, $\angle BAC = 180^o - (65^o + 65^o) = 50^o$

Sol.303.(a)



Here from the given three angles the greater two angles x = z

Then $\frac{x}{y} = \frac{z}{y} = \frac{7}{3}$;

Again from the given diagram we can get

x + y = 180^o

i.e. (7 + 3) = 10 units equivalent to = 180^o

Then the measure of the greater angle

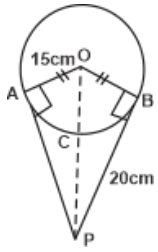
= $180^o \times \frac{7}{10} = 126^o$

Sol.304.(c)

length of the arc of the sector having an angle of 30° is

= $2 \times \frac{22}{7} \times 42 \times \frac{30°}{360°} = 22$ cm.

Sol.305.(d)



As OA = OB = 15 and PB = 20

then from the triangle ΔOPB we get : OP

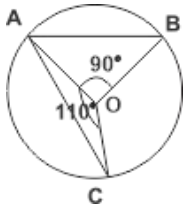
= $\sqrt{PB^2 + OB^2} = \sqrt{20^2 + 15^2} = 25$ cm.

Then the shortest distance between the circle and the point P = (25 - 15) = 10 cm.

Sol.306.(b) One angle is 4 times the other angle and triangle is acute isosceles.
Let one angle = x
Other angle = 4x
The third angle should be equal to either x or 4x
When we take two angle as x then it will be obtuse angle triangle
So two angles will be 4x and 4x
Sum of angles of triangle = 180°
x + 4x +4x = 180° $\Rightarrow 9x = 180°$
$\Rightarrow x = 20°$, 4x = 80°
Only 1 triangle is possible.

Sol.307.(a) Diameter will be hypotenuse of the triangle Diameter
$= \sqrt{7^2 + 24^2} = \sqrt{49 + 576}$
$= \sqrt{625} = 25\ cm$
Circumradius = $\frac{25}{2} = 12.5\ cm$

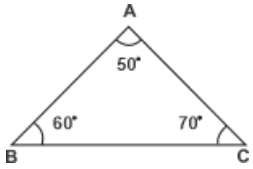
Sol.308.(a)



∠BOC = 360° - (110° + 90°) = 160°
∠BAC = 160°÷ 2 = 80°

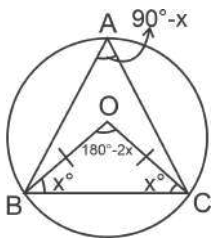
Sol.309.(d) Hypotenuse
$= \sqrt{8^2 + 15^2} = \sqrt{64 + 225} = 17\ cm$

Sol.310.(b)



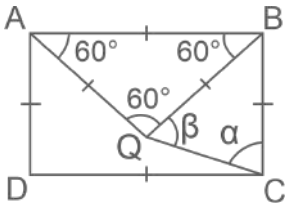
Given , ∠A + ∠B = 110^o -----(i)
∠B - ∠A = 10^o -------(ii)
From equation (i) and (ii)
2∠B = 120°, ∠B = 60 ° and ∠A = 50°
So, AB is the longest side and BC is the shortest side.

Sol.311.(c)



In the given fig.
OB = OC = radius of the circle.
Let , ∠OBC = ∠OCB = x
In triangle OBC
∠ OBC + ∠ BCO + ∠ COB = 180°
∠ COB = 180° - 2X
So that angle ∠ BAC = 90° - X
Hence , ∠BAC + ∠OBC = 90° - x + x = 90°

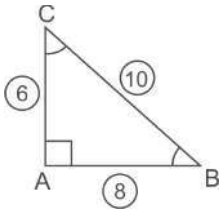
Sol.312.(c)



AQB is an equilateral Triangle
AB = QB = AQ
And ABCD is a square.
Where , AB = BC = CD = AD
AB = BC = BQ -----(i)
Also, ∠ABQ = 60°
∠QBC = 90° - ∠ABQ
∠QBC = 90° - 60° ⇒ ∠QBC = 30°
Now, in triangle QBC , QB = BC { From equation (i) }
Where α = β then α + β + 30° = 2 α + 30°
Hence , 2 α + 30° = 180 ⇒ α = 75°

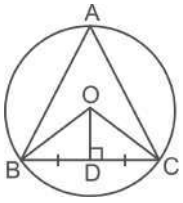
Sol.313.(c)

Formula :- $\tan\theta = \frac{Perpendicular}{Base}$



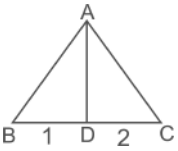
tan B × tan C = $\frac{6}{8} \times \frac{8}{6} = 1$

Sol.314.(b)



The angle formed at the center of a circle by an arc,is doubled of the angle formed by the same arc at the circumference of the circle.
Therefore,
∠BOC = 2∠BAC = 2∠A … e.q .(1)
now ,
In ΔBOD and ΔCOD
OB = OC(radius) OD = OD(common)
∠BDO = ∠ODC = 90°
Therefore, ΔBOD ≅ ∠COD
∴ ∠BOD = ∠COD ……..e.q .(2)
By the eq . 1st and 2nd →
∠BOD = $\frac{1}{2} \times \angle BOC$ = ∠A

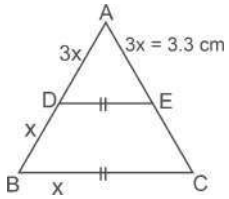
Sol.315.(a)



Ratio of $\frac{BD}{DC} = \frac{1}{2}$
$\frac{Area\ of\ \Delta ABD}{Area\ of\ \Delta ABC} = \frac{BD}{BC} = \frac{1}{3}$

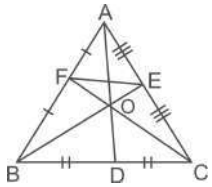
Sol.316.(d) Formula :-
Area of trapezium = $\frac{1}{2}$ × (sum of parallel line) × perpendicular distance between line
Let parallel Sides of trapezium be 5x and 3x .
$\frac{1}{2} \times (8x) \times 24 = 1440$
x = $\frac{1440 \times 2}{8 \times 24} = 15$
So longer side is 5x = 5 × 15 = 75 m

Sol.317.(c)



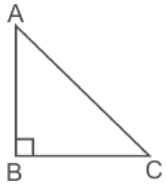
In triangle ABC → $\frac{AD}{DB} = \frac{AE}{EC}$
⇒ $\frac{3.3}{1.1} = \frac{3.3}{EC}$ → EC = 1.1
Therefore, AC = (AE + EC) = 4.4

Sol.318.(c)



$\frac{1}{4}$ × Area of ΔABC = Area of ΔAFE
area of ΔAFE = $\frac{1}{4}$ × 20 = 5 cm^2
Area of trapezium FBCE = Area of ΔABC - Area of ΔAFE
⇒ (20 - 5)cm^2 ⇒ 15cm^2

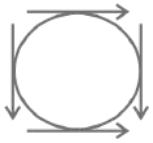
Sol.319.(c)



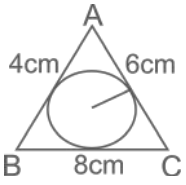
In any triangle , the sum of any two side is always greater than 3rd side and difference of any two side is always less than 3rd side.
(BC + AC) > AB > (BC − AC)
According to option , ΔABC is not possible if (BC - AC) < 6.5cm

Sol.320.(a) Given that ,
Δ ABC ≈ ΔPQR
$\frac{Perimeter\ of\ \Delta\ ABC}{Perimeter\ of\ \Delta\ PQR} = \frac{AB}{PQ}$
$\frac{36}{24} = \frac{AB}{10} \Rightarrow 15$

Sol.321.(b)
The Maximum number of parallel tangents that can be drawn on a circle is two.

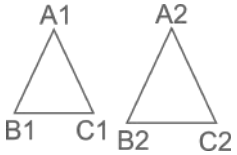


Sol.322.(d)



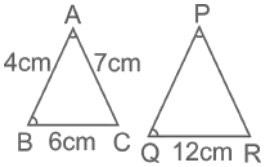
Let ABC is a triangle, whose sides are 4, 6 and 8.
$s = \frac{4+6+8}{2} = 9$
Area of the triangle
$= \sqrt{s(s-a)(s-b)(s-c)}$
$= \sqrt{9 \times 5 \times 3 \times 1} = 3\sqrt{15}\ cm^2$
Radius of the incircle
$= \frac{area\ of\ the\ triangle}{semi\ perimeter} = \frac{3\sqrt{15}}{9} = \frac{\sqrt{15}}{3}$ cm

Sol.323.(d)



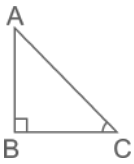
$\Delta A_1B_1C_1 \approx \Delta A_2B_2C_2$ are similar,
Then, $\frac{A_1B_1}{A_2B_2} = \frac{A_1C_1}{A_2C_2} = \frac{B_1C_1}{B_2C_2}$

Sol.324.(a)



If two triangles have two corresponding angles equal, then from AA similarity, both the triangles are similar.
$\frac{AB}{BC} = \frac{PQ}{QR} \Rightarrow \frac{4}{6} = \frac{PQ}{12}$
$\Rightarrow PQ = 8\ cm$

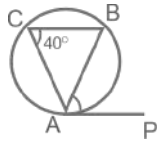
Sol.325.(d)
Let a triangle of sides a , b and c.



$a^2 + b^2 = c^2$
This relation shows pythagoras theorem.
So, ABC is a right angled triangle

Sol.326.(c) As we know ,
(7, 24, 25) and (17, 15, 8) are triplets.
Only option 1 and 4 have sides of the right angle triangle.

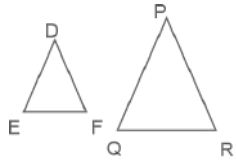
Sol.327.(b)



From alternate segment theorem,
$\angle ACB = \angle PAB$
So, $\angle PAB = 40°$

Sol.328.(c)
Compass is used to draw circles.

Sol.329.(a)

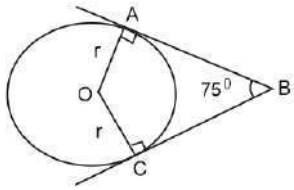


Here, $\Delta DEF \sim \Delta PQR$
From properties of similarity,
$\frac{4}{5} = \frac{DE}{PQ} \Rightarrow DE = \frac{4}{5} \times 15$
$\Rightarrow DE = 12\ cm$

Sol.330.(b) Circumference of circle = 2πr
As , we know that circumference is directly proportional to the radius of circle
if radius is increased 7 times then circumference is also increased by 7 times.

Sol.331.(c) Let BD be x cm
Using tangent secant theorem,
8^2 = x(12 + x)
$\Rightarrow 64 = 12x + x^2 \Rightarrow x^2 + 12x - 64 = 0$
$\Rightarrow x^2 + 16x - 4x - 64 = 0$
⇒x(x + 16) - 4(x+16) = 0
⇒(x+16)(x-4) = 0
x = -16 or 4
So, the length of BD = 4 cm

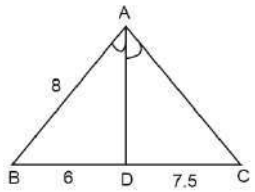
Sol.332.(a)



As we know, the sum of the angles of a quadrilateral is 360°
∠AOC = 360° - (75° + 90 °+ 90°)
= 360° - 255° = 105°

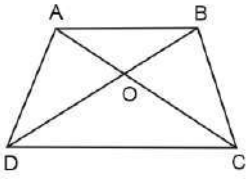
Sol.333.(b) Required angle
$= \left| 30H - \frac{11M}{2} \right|$
where H = hour hand and M = minute hand| |
$= \left| 30 \times 4 - \frac{11 \times 37}{2} \right|$
$= |120 - 203.5| = 83.5°$

Sol.334.(c)



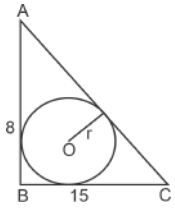
Since, AD is the angle bisector of ∠BAC.
Then, $\frac{AB}{AC} = \frac{BD}{DC} \Rightarrow \frac{8}{AC} = \frac{6}{7.5}$
$\Rightarrow$ AC = $\frac{7.5 \times 8}{6}$ = 10 cm

Sol.335.(d)



In △AOB and △COD, we have :
∠OAB =∠OCD
∠OBA =∠ODC
So, △AOB~ △COD (By AAA rule)
$\frac{AO}{CO} = \frac{OB}{OD}$
$\Rightarrow \frac{AO}{CO} + 1 = \frac{OB}{OD} + 1$
$\Rightarrow \frac{AO+CO}{CO} = \frac{OB+OD}{OD}$
$\frac{AC}{OC} = \frac{BD}{OD}$
$\frac{AC}{BD} = \frac{OC}{OD}$ --------- (1)
Again, $\frac{AO}{CO} - 1 = \frac{OB}{OD} - 1$
$\frac{AO-CO}{CO} = \frac{OB-OD}{OD}$
$\frac{OC}{OD} = \frac{AO-CO}{OB-OD}$ --------- (2)
From (1) and (2) we have :
$\frac{AC}{BD} = \frac{AO-CO}{OB-OD}$

Sol.336.(c)



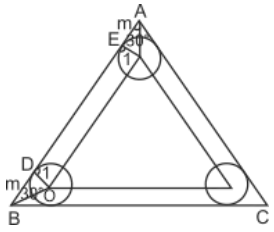
Using pythagoras theorem, we have :

AC = $\sqrt{15^2 + 8^2}$ = $\sqrt{289}$ = 17 cm

Inradius = $\frac{AB + BC - AC}{2}$ = $\frac{15+8-17}{2}$

= $\frac{6}{2}$ = 3 cm

Sol.337.(b)



In △DOB,

tan30° = $\frac{1}{m}$

$\frac{1}{\sqrt{3}} = \frac{1}{m}$ ⇒ m = $\sqrt{3}$

So, the original length of an equilateral triangle = 6 - $\sqrt{3}$ - $\sqrt{3}$ = (6 - 2$\sqrt{3}$) cm

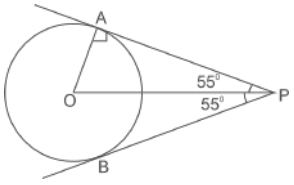
Sol.338.(d) Length of transverse common tangent = $\sqrt{10^2 - (3.5 + 4.5)^2}$

= $\sqrt{100 - 64}$ = $\sqrt{36}$ = 6 cm

Sol.339.(b) The number of diagonals in a pentadecagon is

= $\frac{15(15-3)}{2}$ = $\frac{15\times12}{2}$ = 90

Sol.340.(b)



∠APB = 110°

⇒ ∠APO = ∠BPO = $\frac{110}{2}$ = 55°

In △APO, we have :

∠POA = 90° - 55° = 35°

Sol.341.(c) Let the bigger triangle be an equilateral triangle of side '3a'

Then, the side of the triangle formed from the vertices of bigger triangle is 'a'

Area of 3 smaller triangle

= 3 × $\frac{\sqrt{3}}{4}$ × $(a)^2$ = $\frac{3\sqrt{3}}{4}a^2$

Area of bigger triangle

= $\frac{\sqrt{3}}{4}$ × $(3a)^2$ = $\frac{9\sqrt{3}}{4}a^2$

Area of rest of the bigger triangle

= $\frac{9\sqrt{3}}{4}a^2$ - $\frac{3\sqrt{3}}{4}a^2$ = $\frac{6\sqrt{3}}{4}a^2$

Required ratio = $\frac{3\sqrt{3}}{4}a^2$: $\frac{6\sqrt{3}}{4}a^2$ = 1 : 2

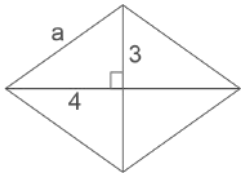
Sol.342.(d) Area of rhombus =

$\frac{1}{2}$ × D_1 × D_2

⇒ 24 = $\frac{1}{2}$ × 8 × D_2 ⇒ 24 = 4D_2

D_2 = $\frac{24}{4}$ = 6

Since, the diagonals of rhombus bisect each other at 90°.



Then, length of each side of rhombus(a)

= $\sqrt{(\frac{8}{2})^2 + (\frac{6}{2})^2}$ = $\sqrt{16 + 9}$

= $\sqrt{25}$ = 5 m

Sol.343.(d) The base of triangle(B)

= $\frac{1}{3}$ base of parallelogram(b)

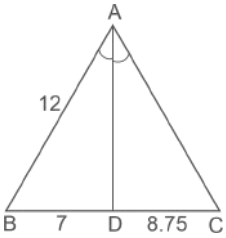
ATQ,

Area of triangle = Area of parallelogram

⇒ $\frac{1}{2}$× B × H = 3B × h

$\frac{H}{h}$ = $\frac{6}{1}$

Sol.344.(b)



Using angle bisector theorem, we have ;

$\frac{AB}{AC}$ = $\frac{BD}{DC}$ ⇒ $\frac{12}{AC}$ = $\frac{7}{8.75}$

⇒ AC = $\frac{8.75 \times 12}{7}$ = 15 cm

Sol.345.(a) From the properties of similar triangles,

Ratio of the corresponding sides of the two triangles = ratio of its corresponding heights.

So, ratio of their corresponding heights = 2 : 3

Sol.346.(c) Let the measure of the remaining angle be x°

Sum of the interior angles of a regular polygon = $(n - 2)\times180°$

Where, n is the number of sides of the polygon.

Sum of all angles of the hexagon

= (6 - 2) × 180 = 720°

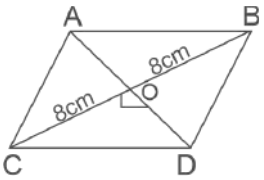
Now, $5 \times 116 + x = 720$

⇒ $x + 580 = 720$

⇒ $x = 720 - 580$ ⇒ $x = 140°$

So, the measure of the remaining angle = 140°

Sol.347.(b)



Let ABDC is a rhombus with side 17 cm and one diagonal 16 cm.

From properties of rhombus,

its diagonals bisect each other at 90°.

So, OC = OB = 8 cm

In ΔOCD, from pythagoras theorem,

OD = $\sqrt{17^2 - 8^2} = \sqrt{225} = 15\ cm$

So, AD = 2 ×15 = 30 cm

Hence, the length of the other diagonal = 30 cm

Algebra

Important Formulas:-

- $(a+b)^2+(a-b)^2=a^2+b^2+2ab$
  $+a^2+b^2-2ab=2(a^2+b^2)$
- $(a+b)^2-(a-b)^2=4ab$
- $(a+b)^2-4ab=(a-b)^2$
- $a^2-b^2=(a+b)(a-b)$
- $a^4-b^4=(a^2+b^2)(a+b)(a-b)$
- $a^2+\frac{1}{a^2}=\left(a+\frac{1}{a}\right)^2-2$
  $=\left(a-\frac{1}{a}\right)^2+2$
- $a^2+b^2+c^2-ab-bc-ca=$
  $\frac{1}{2}\{(a-b)^2+(b-c)^2+(c-a)^2\}$
  If $a=b=c=k$ then,
  $a^2+b^2+c^2=ab+bc+ca$,
- $(a+b)^3=a^3+b^3+3ab(a+b)$
- $(a-b)^3=a^3-b^3-3ab(a-b)$
- $a^3+b^3=(a+b)(a^2+b^2-ab)$
- $a^3-b^3=(a-b)(a^2+b^2+ab)$
- $a^3+\frac{1}{a^3}=\left(a+\frac{1}{a}\right)^3-3\left(a+\frac{1}{a}\right)$
- $a^3-\frac{1}{a^3}=\left(a-\frac{1}{a}\right)^3+3\left(a-\frac{1}{a}\right)$
- $a^3+b^3+c^3-3abc=$ (a+b+c)
  $(a^2+b^2+c^2-ab-bc-ca)$
  Or, $\frac{1}{2}(a+b+c)\{(a-b)^2+(b-c)^2$
  $+(c-a)^2\}$ Or,
  (a + b + c)[$(a+b+c)^2$- 3(ab + bc + ca)]
  Or, $\frac{1}{2}$(a + b + c)
  $\left[3(a^2+b^2+c^2)-(a+b+c)^2\right]$
- If $(a+b+c)=0$, then
  $a^3+b^3+c^3=3abc$
- If $(a-b-c)=0$, then
  $a^3-b^3-c^3=3abc$
- If $(a+b-c)=0$, then
  $a^3+b^3-c^3=-3abc$
- If $a^3+b^3+c^3=3abc$,
  then either a = b = c or a + b + c = 0
- $(a+b+c)^2=$
  $a^2+b^2+c^2+2(ab+bc+ac)$
- $(a+b+c)^3=a^3+b^3+c^3+$
  $3(a+b)(b+c)(a+c)$
- $a^4+a^2b^2+b^4=(a^2+ab+b^2)$
  (a^2-ab+b^2)
- If $(x^2+y^2+z^2)=0$,
  then $x=0$, $y=0$, $z=0$

If $x+\frac{1}{x}=a$, then $x^3+\frac{1}{x^3}=a^3-3a$

- If $x-\frac{1}{x}=a$, then $x^3-\frac{1}{x^3}=a^3+3a$
- If $x+\frac{1}{x}=a$, then $x^2+\frac{1}{x^2}=a^2-2$
- If $x-\frac{1}{x}=a$, then $x^2+\frac{1}{x^2}=a^2+2$
- If $x+\frac{1}{x}=a$, then $x-\frac{1}{x}=\sqrt{a^2-4}$
- If $x-\frac{1}{x}=a$, then $x+\frac{1}{x}=\sqrt{a^2+4}$
- If $x+\frac{1}{x}=a$, then
  $x^2-\frac{1}{x^2}=a\sqrt{a^2-4}$
- If $x-\frac{1}{x}=a$, then
  $x^2-\frac{1}{x^2}=a\sqrt{a^2+4}$
- If $x+\frac{1}{x}=a$, then
  $x^4+\frac{1}{x^4}=(a^2-2)^2-2$
- If $x-\frac{1}{x}=a$, then
  $x^4+\frac{1}{x^4}=(a^2+2)^2-2$
- If x + $\frac{1}{x}$ = a , then $x^5+\frac{1}{x^5}$
  = $(x^2+\frac{1}{x^2})(x^3+\frac{1}{x^3})-(x+\frac{1}{x})$
- If x - $\frac{1}{x}$ = a, then $x^5-\frac{1}{x^5}$ =
  $(x^2+\frac{1}{x^2})(x^3-\frac{1}{x^3})-(x-\frac{1}{x})$
- If $x+\frac{1}{x}=\pm\sqrt{3}$, then $x^6=-1$
- If $x+\frac{1}{x}=1$, then $x^3=-1$
- If $x+\frac{1}{x}=-1$, then $x^3=1$
- If $x+\frac{1}{x}=2$, then $x=1$, similarly if
  $x+\frac{1}{x}=-2$, then $x=-1$

Some Special Case :-

➽ if $a^2-ab+b^2=0$ then $a^3+b^3=0$

➽ if $\frac{1}{a}-\frac{1}{b}=\frac{1}{a-b}$ then $a^3+b^3=0$

➽ if $\frac{a}{b}+\frac{b}{a}=\frac{1}{a+b}$ then $a^3-b^3=0$

➽ if $\frac{a}{b}+\frac{b}{a}=-1$ then $a^3-b^3=0$

➽ if $\frac{a}{b}+\frac{b}{a}=1$ then $a^3+b^3=0$

➽ if $a^2+a+1=0$ then $a^3-1=0$ or $a^3=1$

➽ if ab(a + b) =1 then $\frac{1}{a^3b^3}-a^3-b^3=3$

- Dividendo – Componendo rule:
  If $\frac{a}{b}=\frac{c}{d}$ then, $\frac{a+b}{a-b}=\frac{c+d}{c-d}$
  If $\frac{a+b}{a-b}=\frac{c}{d}$ then $\frac{a}{b}=\frac{c+d}{c-d}$
- If $(x-a)^2+(y-b)^2+(z-c)^2=0$ then by putting $x=a$, $y=b$, $z=c$ in an expression we can find the value of the expression.
- If $x+y=a$, then xy will be maximum when $x=y$.
- If xy = a, then $(x+y)$ will be minimum when $x=y=\sqrt{a}$

Law of Indices :

(1) $a^m\times a^n=a^{m+n}$ (2) $\frac{a^m}{a^n}=a^{m-n}$

(3) $(a^m)^n=a^{mn}$ (4) $\left(\frac{a}{b}\right)^n=\frac{a^n}{b^n}$

(5) $a^0=1$ (6) $a^{\frac{1}{n}}=\sqrt[n]{a}$

If a is negative number and n is an odd number then $\sqrt[n]{-a}=-a$

Law of surds :

(1) $\sqrt[n]{a}=a^{\frac{1}{n}}$

(2) $\sqrt[n]{a}\times\sqrt[n]{b}=\sqrt[n]{ab}$

(3) $\frac{\sqrt[n]{a}}{\sqrt[n]{b}}=\sqrt[n]{\frac{a}{b}}$

(4) $\sqrt[m]{\sqrt[n]{a}}=\sqrt[mn]{a}$

(5) $(\sqrt[n]{a})^m=\sqrt[n]{a^m}$

Ex.1. If $3\sqrt{5}$ is given, find out the rationalizing factor.

Soln : $3\sqrt{5}\times\sqrt{5}=3\times5=15$, so the rationalizing factor of $3\sqrt{5}$ is $\sqrt{5}$.

Rules for making a perfect square :

1. Middle term =
   $\pm\sqrt{First\ term\times Third\ term}$
2. First term = $\frac{(Middle\ term)^2}{4\times Third\ term}$
3. Third term = $\frac{(Middle\ term)^2}{4\times First\ term}$

Quadratic and cubic equation :

- For quadratic equation : $ax^2+bx+c=0$, then
  Sum of its zeros $(\alpha+\beta)=-\frac{b}{a}$
  Product of its zeros $(\alpha\beta)=\frac{c}{a}$

where, α amd β are roots of a given quadratic equation.

- **For cubic equation :**

$ax^3 + bx^2 + cx + d = 0$, then

Sum of its zeros (α+β+γ)= - $\frac{b}{a}$

Product of its zeros (αβγ) = - $\frac{d}{a}$

Sum of its zeros taken two at a time (αβ + βγ + γα) = $\frac{c}{a}$

where α, β and γ are roots of a given cubic equation.

Variety Questions

Q.1. The roots of the equation ax^2 + x + b = 0 are equal if:
Group D 17/08/2022 (Morning)
(a) ab = $\frac{1}{4}$ (b) b^2 < 4a
(c) b^2 > 4a (d) b² = 4a

Q.2. Which is a quadratic equation?
(A) b - $\sqrt{3}$ + 2b - $\sqrt{32}$ = 0
(B) (x - 4x² + 5) + $\sqrt{3}$ x + 8 = 0
(C) (p - q)² - q³ + 2pq - $\sqrt{p}$ = −3
(D) $(x + 3)^{\frac{1}{2}}$ = 0
Group D 17/08/2022 (Morning)
(a) B (b) D (c) A (d) C

Q.3. What is the nature of the roots of 3x² + 6x - 5 = 0
Group D 17/08/2022 (Afternoon)
(a) The roots are real and distinct.
(b) The roots are real and equal.
(c) The roots are real and more than 2.
(d) There are no real roots.

Q.4. The product of the roots of $3x^2$ - 13x + 6 = 0 is:
Group D 17/08/2022 (Afternoon)
(a) 3 (b) 4 (c) 2 (d) 5

Q.5. One of the roots of the equation x² - 12x + k = 0 is x = 3. The other root is _____.
Group D 18/08/2022 (Morning)
(a) x = 4 (b) x = 9 (c) x = - 4 (d) X = - 9

Q.6. If a and b are the roots of the equation x² - 7x + 12 = 0, then the value of $\frac{a^3+b^3}{a^2+b^2+1}$ is:
Group D 23/08/2022 (Afternoon)
(a) 2.6 (b) 5.2 (c) 4.4 (d) 3.5

Q.7. If x - $\frac{1}{x}$ = 8, then find the value of $x^3 - \frac{1}{x^3}$.
Group D 26/08/2022 (Afternoon)
(a) 425 (b) 536 (c) 489 (d) 541

Q.8. If $x + \frac{1}{x}$ = 42,
then what is the value of $x^3 + \frac{1}{x^3}$?
Group -D 30/08/2022 (Afternoon)
(a) 72,629 (b) 74,130
(c) 73,962 (d) 74,926

Q.9. Which of the following is a quadratic equation whose roots are 7 and 12?
Group D 08/09/2022 (Morning)
(a) 2x² - 19x + 84 = 0 (b) x² - 19x + 34 = 0
(c) x² - 14x + 84 = 0 (d) x² - 19x + 84 = 0

Q.10. If x + $\frac{1}{x}$ = 3 ,then $x^6 + \frac{1}{x^6}$ is:
Group D 18/09/2022 (Evening)
(a) 364 (b) 927 (c) 414 (d) 322

Q.11. Which of the following equations is NOT a quadratic equation?
Group D 27/09/2022 (Afternoon)
(a) $(2x + 1)(3x - 4) = 2x^2 + 3$
(b) $\sqrt{3}\,x^2 - 2x + \frac{1}{\sqrt{2}} = 0$
(c) $x^2 + 2\sqrt{x} - 5 = 0$
(d) $(x + 2)^3 = x^3 - 5$

Q.12. If the sum and the product of the roots of an quadratic equation are $\frac{q}{p}$ and $\frac{r^2}{q}$, respectively, where p, q ≠ 0, then the quadratic equation and the discriminant of the quadratic equation are given, respectively, as:
Group D 30/09/2022 (Afternoon)
(a) $pqx^2 + q^2x + pr^2$ and $q^4 - 4p^2r^2q$
(b) $pqx^2 - q^2x + pr^2 = 0$ and $q^4 - 4p^2r^2q$
(c) $pqx^2 - q^2x + pr^2 = 0$ and $q^4 + 4p^2r^2q$
(d) $pqx^2 + q^2x + pr^2 = 0$ and $q^4 - 4p^2r^2q$

Q.13. The discriminant of the quadratic equation $bx^2 + cx + a = 0;\ b \neq 0$, is given by the expression
Group D 07/10/2022 (Afternoon)
(a) $b^2 - 4ac$ (b) $a^2 - 4ab$
(c) $b^2 + 4ac$ (d) $c^2 - 4ab$

Q.14. If 3x + 2y = 13 and $y^2 - 4y + 4 = 0$, then find (x,y)
NTPC CBT II Level 6 (09/05/2022) Shift 1
(a) (4, 2) (b) (5, −1) (c) (2, 3) (d) (3, 2)

Q.15. If a + b = 15, and $a^2 + b^2$ =113, then what is the value of $a^3 + b^3$?
NTPC CBT II Level 3 (17/06/2022) Shift 2
(a) 865 (b) 845 (c) 855 (d) 87

Q.16. If $\frac{X}{2} + \frac{2}{Y} = 1$ and $\frac{y}{2} + \frac{2}{z} = 1$, then the value of $\frac{z}{2} + \frac{2}{x}$ is
NTPC CBT - I 28/12/2020 (Morning)
(a) -1 (b) 0 (c) 2 (d) 1

Q.17. If x + ($\frac{1}{x}$) = 12 and x² - $\frac{1}{x^2}$ = 50 , then the value of $x^4 - \frac{1}{x^4}$ is
NTPC CBT - I 29/12/2020 (Evening)
(a) 600 (b) 7200 (c) 7100 (d) 1800

Q.18. If the degree of polynomial $9x^5y^2z^r$ is 15, then r = ?
NTPC CBT - I 19/01/2021 (Morning)
(a) 7 (b) 8 (c) 6 (d) 9

Q.19. The sum of two numbers is 25 and the product is 35. The sum of their reciprocals is:
NTPC CBT - I 27/01/2021 (Morning)
(a) $\frac{3}{7}$ (b) $\frac{6}{7}$ (c) $\frac{4}{7}$ (d) $\frac{5}{7}$

Q.20. If x - $\frac{1}{x}$= 5, find the value of $x^4 + \frac{1}{x^4}$.
NTPC CBT - I 28/01/2021(Morning)
(a) 730 (b) 727 (c) 728 (d) 729

Q.21. If $x^3 + \frac{1}{x^3}$ =18 then what will be the value of $x + \frac{1}{x}$?
NTPC CBT - I 02/02/2021 (Morning)
(a) 9 (b) 1 (c) 3 (d) 4

Q.22. If $x^4 + \frac{1}{x^4}$ = 322 then, $x^3 - \frac{1}{x^3}$ = ?
NTPC CBT - I 15/02/2021 (Morning)
(a) 70 (b) 76 (c) 67 (d) 84

Q.23. Calculate the value of $\sqrt{80} + 4\sqrt{5}$ if $2\sqrt{5} + \sqrt{125} = 7x$
NTPC CBT - I 15/02/2021 (Evening)
(a) 6x (b) 9x (c) 8x (d) 7.5x

Q.24. If (x + $\frac{1}{x}$) = 7, then (x - $\frac{1}{x}$) is equal to:
NTPC CBT - I 16/02/2021 (Evening)
(a) $2\sqrt{5}$ (b)$\sqrt{5}$ (c) $3\sqrt{5}$ (d) $5\sqrt{5}$

Q.25. If the system of equation 3x - 2y = 8, 2ax + (a - b)y = 48 has infinitely many solutions then:
NTPC CBT - I 12/03/2021 (Evening)
(a) a = 3b (b) 3a + b = 0
(c) a + 3b = 0 (d) a = b

Q.26. if $x^4 + \frac{1}{x^4}$ = 47 then find $x + \frac{1}{x}$

RRB JE 01/06/2019 (Evening)
(a) 5 (b) 7 (c) 9 (d) 3

Q.27. The two roots of an quadratic equation are given as x = $\frac{2}{3}$ and x = $\frac{-1}{2}$
The equation can be written as:
ALP Tier - I 20/08/2018 (Afternoon)
(a) (2x - 1) (3x - 2) = 0
(b) (2x - 1) (3x + 2) = 0
(c) (2x + 1) (3x - 2) = 0
(d) (2x + 1) (3x + 2) = 0

Q.28. If $a^2 + \frac{1}{a^2}$ = 3, then $a^3 + \frac{1}{a^3}$ = ?
ALP Tier - I 21/08/2018 (Evening)
(a) $3\sqrt{5}$ (b) $3\sqrt{3}$ (c) $2\sqrt{5}$ (d) $2\sqrt{3}$

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.29. If x + y + z = 11 and xy + yz + zx= 42 , then the value of x² + y² + z² is:
Group D 17/08/2022 (Morning)
(a) 37 (b) 43 (c) 41 (d) 39

Q.30. The expansion of $(3a - 4b - 2c)^2$ is:
Group D 17/08/2022 (Afternoon)
(a) $9a^2 + 16b^2 + 4c^2$ - 24ab + 8bc + 12ac
(b) $9a^2 + 16b^2 + 4c^2$ - 24ab + 16bc - 6ac
(c) $9a^2 + 16b^2$ + 4c² + 12ab - 8bc + 6ac
(d) $9a^2 + 16b^2 + 4c^2$ - 24ab + 16bc - 12ac

Q.31 The sum of the roots of the quadratic equation 4x² + 7x - 21 = 0 is:
Group D 17/08/2022 (Evening)
(a) $\frac{-21}{14}$ (b) -21 (c) $\frac{-7}{4}$ (d) $\frac{7}{4}$

Q.32. If the sum of the roots of the quadratic equation 5x² + bx + 4 = 0 is 9, then find the value of b.
Group D 17/08/2022 (Evening)
(a) -25 (b) -45 (c) 0 (d) 20

Q.33. If a and b are the roots of x² + x - 2 = 0, then the quadratic equation in x whose roots are $\frac{1}{a} + \frac{1}{b}$ and ab is:
Group D 18/08/2022 (Morning)
(a) 2x² + 5x - 2 = 0 (b) 2x² + 3x - 2 = 0
(c) 2x² - 5x + 2 = 0 (d) 2x² - 3x + 2 = 0

Q.34. If 3x - 2y = 10 and xy = 11, the value of 27x³ - 8y³ is _____.
Group D 18/08/2022 (Afternoon)
(a) 2980 (b) 2569 (c) 3336 (d) 3170

Q.35. Find the roots of $\frac{6}{x} - \frac{2}{x-1} - \frac{1}{x-2} = 0$
Group D 18/08/2022 (Afternoon)
(a) $\frac{4}{5}$ and $\frac{3}{2}$ (b) $\frac{4}{3}$ and $\frac{3}{2}$
(c) $\frac{4}{3}$ and 3 (d) $\frac{4}{5}$ and 3

Q.36. If x² + 2x + 9 = (x − 2)(x - 3), then the resultant equation is:
Group D 18/08/2022 (Afternoon)
(a) a cubic polynomial
(b) not a quadratic equation
(c) a cubic equation
(d) a quadratic equation

Q.37. If a + b = 56 and (a - b)² = 496, find the value of product of a and b.
Group D 18/08/2022 (Afternoon)
(a) 660 (b) 760 (c) 560 (d) 460

Q.38. Find the roots of the equation $6p^2 - 5p - 6 = 0$.
Group D 18/08/2022 (Evening)
(a) - $\frac{2}{3}$ and $\frac{3}{2}$ (b) $\frac{3}{4}$ and $\frac{3}{2}$
(c) $\frac{2}{3}$ and $\frac{2}{3}$ (d) - $\frac{1}{3}$ and $\frac{4}{3}$

Q.39. If d² + $\frac{1}{d^2}$ = 18, and d > $\frac{1}{d}$ then the value of d³ - $\frac{1}{d^3}$ is :
Group D 18/08/2022 (Evening)
(a) 91 (b) 64 (c) 76 (d) 81

Q.40. Find the quadratic equation that has $(1 + \sqrt{3})$ as one of its roots.
Group D 22/08/2022 (Morning)
(a) x² + 2x + 1 = 0 (b) x² + 2x + 2 = 0
(c) x² - 2x - 2 = 0 (d) x² + $\sqrt{3}$x + 1=0

Q.41. The equation x² + 7x + 6 = 0 can be written as:
Group D 22/08/2022 (Afternoon)
(a) (x - 1)(x - 6) = 0 (b) (x + 1)(x + 6) = 0
(c) (x - 1)(x + 6) = 0 (d) (x + 1)(x - 6) = 0

Q.42. The value of $\frac{(4x^2 - 9y^2)^3 + (9y^2 - 49z^2)^3 + (49z^2 - 4x^2)^3}{(2x - 3y)^3 + (3y - 7z)^3 + (7z - 2x)^3}$ is:
Group D 22/08/2022 (Evening)
(a) 42xyz (2x - 3y) (3y - 7z) (7z - 2x)
(b) (2x + 3y) (3y + 7z) (7z + 2x)
(c) 42xyz (2x + 3y) (3y + 7z) (7z + 2x)
(d) (2x - 3y)(3y - 7z)(7z - 2x)

Q.43. The equation x² - 6x + 9 = 0 can be written as:
Group D 22/08/2022 (Evening)
(a) (x - 2)(x - 3) = 0 (b) (x - 2)(x - 3)² = 0
(c) (x + 3)² = 0 (d) (x - 3)² = 0

Q.44. Which of the following is a quadratic equation whose roots are $\frac{7}{3}$ and $\frac{12}{5}$?
Group D 22/08/2022 (Evening)
(a) 15x² - 70x + 84 = 0
(b) 15x² - 72x + 84 = 0
(c) x² - 71x + 84 = 0
(d) 15x² - 71x + 84 = 0

Q.45. If $x^2 + xy + x = 18$ *and* $y^2 + xy + y = 24$, *then the value of* $x + y$ *is*:
Group D 23/08/2022 (Morning)
(a) - 5 or 6 (b) 5 or - 6
(c) 6 or -7 (d) - 6 or 7

Q.46. Find the roots of $\sqrt{2x + 9}$ + x = 13
Group D 23/08/2022 (Afternoon)
(a) 4 and 20 (b) 2 and 8
(c) 20 and 8 (d) 8 and 6

Q.47. If $a^4 + \frac{1}{a^4}$ = 34, then the value of $a^6 + \frac{1}{a^6}$ is:
Group D 23/08/2022 (Afternoon)
(a) 243 (b) 198 (c) 185 (d) 216

Q.48. If a + b + c = 6 and ab + bc + ca = - 2, then find the value of a³ + b³ + c³ -3abc .
Group D 23/08/2022 (Evening)
(a) 252 (b) 240 (c) 200 (d) 192

Q.49. Find the roots of the equation:
x^2 + 11x - 26 = 0
Group D 23/08/2022 (Evening)
(a) 13 and - 2 (b) - 2 and 11
(c) - 13 and 2 (d) 11 and 2

Q.50. Which of the following is a quadratic equation?
A. x(x − 4) = 2x + x² - 7
B. 5 (2y + 3) - 6y = 5y(y² - 8y)
C. k (k + 1) - k (k - 2) 2k = 0
D. p(p² + 7) = p² + p³ - 18
Group D 23/08/2022 (Evening)
(a) Only C (b) Only A (c) Only B (d) Only D

Q.51. If 16x² - 8x + 1 = 0, then find the value of $(16x^2 + \frac{1}{4x^2})$.
Group D 23/08/2022 (Evening)
(a) 4 (b) 6 (c) 5 (d) 7

Q.52. Find the roots of 3a²x² + 8abx + 4b²=0
Group D 24/08/2022 (Morning)
(a) - $\frac{2b}{a}$ and − $\frac{2b}{a}$ (b) - $\frac{2b}{a}$ and − $\frac{3b}{2b}$
(c) - $\frac{2b}{a}$ and − $\frac{2b}{3a}$ (d) - $\frac{2b}{3a}$ and − $2b$

Q.53. If 1+ $\sqrt{3}$ and 1- $\sqrt{3}$ are the roots of a quadratic equation, find the quadratic equation.

Group D 24/08/2022 (Afternoon)
(a) x^2 – 2x - 3= 0 (b) x^2 – 2x + 2 = 0
(c) x^2 – 2x – 2 = 0 (d) x^2 – 2x + 3 = 0

Q.54. The coefficient of x^4y^3 in the expansion of $(3x - 2y)^2(x^2 + y^3)^2$ is:
Group D 24/08/2022 (Evening)
(a) 14 (b) 18 (c) 12 (d) 15

Q.55. If one root of the equation (a + 3)x² - 13ax + 7 - a = 0 is the reciprocal of the other, then the value of a is:
Group D 24/08/2022 (Evening)
(a) 2 (b) -3 (c) 3 (d) -2

Q.56. For what values of z will the following equation have equal roots?
(z + 4)x² + (z + 1)x + 1 = 0
Group D 24/08/2022 (Evening)
(a) 2,-3 (b) 4, 3 (c) 5,-3 (d) 2,-5

Q.57. Simplify:
a² + 9b² + c² - 6ab + 6bc - 2ac =
Group D 25/08/2022 (Morning)
(a) $(a + 3b + c)^2$ (b) $(a - 3b + c)^2$
(c) $(a - 3b - c)^2$ (d) $(a - 3b - 2c)^2$

Q.58. If one root of a quadratic equation, α, is half of the other root of the same equation, then find the quadratic equation.
Group D 25/08/2022 (Morning)
(a) x² + 3αx + 2α² = 0 (b) x² + 3αx - 2α² = 0
(c) x² - 3αx + 2α² = 0 (d) x² - 3αx - 2α² = 0

Q.59. Which of the following is the quadratic equation whose roots are -2 and 4?
Group D 25/08/2022 (Afternoon)
(a) 2x² - 6x - 24 = 0 (b) 3x² - 5x - 24 = 0
(c) 3x² - 6x - 24 = 0 (d) 3x² - 6x - 20 = 0

Q.60. If a and b are the roots of x² - x - 12 = 0, and a > b, then the quadratic equation in x whose roots are (2a - 1) and (2b + 1) is:
Group D 25/08/2022 (Afternoon)
(a) x² - 4x + 45 = 0 (b) x² - 4x - 45 = 0
(c) x² - 2x + 35 = 0 (d) x² - 2x - 35=0

Q.61. Solve
$(a - b)^3 + (b - 2c)^3 + (- a + 2c)^3$.
Group D 25/08/2022 (Evening)
(a) $a - b + 2c$
(b) $a - 2c + 4b$
(c) $3((a - b)(b - 2c)(- a + 2c))$
(d) $(a - b + 2c)^2$

Q.62. The roots of quadratic equation that satisfies $12x^2 = 27x$ are:
Group D 25/08/2022 (Evening)
(a) 0 , $\frac{3}{4}$ (b) 1 , $\frac{4}{3}$ (c) 1 , $\frac{3}{4}$ (d) 0 , $\frac{9}{4}$

Q.63. Simplify $(2z - 5y)^2 + (5z + 2y)^2 - 25z^2$
Group D 26/08/2022 (Morning)
(a) $19y^2 + 4z^2$ (b) $29y^2 + 4z^2$
(c) $19y^2 - 4z^2$ (d) $29y^2 - 4z^2$

Q.64. The equation 2x² + 7x + 6 = 0 can be written as:
Group D 26/08/2022 (Morning)
(a) (2x - 3)(x + 2) = 0 (b) (2x + 3)(x + 2) = 0
(c) (2x + 3)(x - 2) = 0 (d) (2x - 3)(x - 2) = 0

Q.65. If a² + b² = 50 and a × b = 7. Find $\frac{(a-b)}{(a+b)}$,where a > b.
Group D 26/08/2022 (Morning)
(a) $\frac{3}{5}$ (b) $\frac{4}{3}$ (c) $\frac{5}{3}$ (d) $\frac{3}{4}$

Q.66. If one of the roots of a quadratic equation is $\frac{1}{2-\sqrt{2}}$ then find the quadratic equation.
Group D 26/08/2022 (Morning)
(a) √2x² + 3x + 2 = 0 (b) - 2x² + 3x + 5 = 0
(c) √2x² + 3x - 2 = 0 (d) 2x² - 4x + 1 = 0

Q.67. x^2 – 2x + 3 = 0 is a _____.
Group D 26/08/2022 (Afternoon)
(a) cubic equation
(b) quadratic equation
(c) quadratic polynomial
(d) cubic polynomial

Q.68. Find the quadratic equation whose roots are equal to the sum and product of the roots of the quadratic equation $2x^2$ + 4x - 1 = 0 .
Group D 26/08/2022 (Afternoon)
(a) - x^2 + 5x + 1 = 0 (b) x^2 + 2x + 5 = 0
(c) $2x^2$ - x + 5 = 0 (d) $2x^2$ + 5x + 2 = 0

Q.69. If x^3 – 3x + 6 = 0 then it is _____.
Group D 26/08/2022 (Evening)
(a) a quadratic equation
(b) a quadratic expression
(c) not a quadratic equation
(d) a linear equation

Q.70. If x = 2 + $\sqrt{5}$ and y = 2 - $\sqrt{5}$, then find the value of $x^2 + y^2$.
Group D 26/08/2022 (Evening)
(a) 18 (b) 20 (c) 16 (d) 22

Q.71 If a and b are the roots of the equation x^2- 5x - 14 = 0 , then find the value of $a^3b^2 + a^2b^3$.
Group D 26/08/2022 (Evening)
(a) 980 (b) 670 (c) 840 (d) 670

Q.72. Find the sum of the roots of the quadratic equation 7x² + 28x + 1= 0.
Group D 29/08/2022 (Morning)
(a) 28 (b) - $\frac{1}{7}$ (c) 1 (d) - 4

Q.73. If a + b = 48 and ab = 56, then what is the value of $a^3 + b^3$?
Group D 29/08/2022 (Morning)
(a) 1,02,528 (b) 1,20,825
(c) 1,20,528 (d) 1,02,258

Q.74. If the roots of quadratic equation (2 - p)x² + 2px - (p + 1) = 0 are equal, then the value of p is:
Group D 29/08/2022 (Morning)
(a) 2 (b) -2 (c) 1 (d) -1

Q.75. Find the negative root of 3x² + 12x - 15 = 0.
Group D 29/08/2022 (Morning)
(a) x = 5 (b) x = -1 (c) x = -5 (d) x = 1

Q.76. Find the positive difference between the roots of the equation $2x^2 - 7x + 5 = 0$.
Group D 29/08/2022 (Afternoon)
(a) $-\frac{3}{2}$ (b) $\frac{5}{2}$ (c) $-\frac{5}{2}$ (d) $\frac{3}{2}$

Q.77. Which of the following quadratic equations has one of its roots as $2 + \sqrt{5}$?
Group D 29/08/2022 (Afternoon)
(a) $x^2 + 5x + 1 = 0$ (b) $x^2 - 4x - 1 = 0$
(c) $x^2 + 4x + 1 = 0$ (d) $x^2 - 5x - 1 = 0$

Q.78. What is the nature of the roots of $\sqrt{3}$x² + 6x - $\sqrt{3}$ = 0?
Group D 29/08/2022 (Evening)
(a) The roots are real and more than 2.
(b) The roots are real and equal.
(c) There are no real roots.
(d) The roots are real and distinct.

Q.79. The roots of the quadratic equation $2x^2$ - x - 3 = 0 are:
Group D 29/08/2022 (Evening)
(a) 1,$\frac{-3}{2}$ (b) -1,$\frac{3}{2}$ (c) 1,$\frac{3}{2}$ (d) -1,$\frac{-3}{2}$

Q.80. If a + b = 25 and a - b = 13, find the value of (a + b)².
Group D 29/08/2022 (Evening)
(a) 625 (b) 496 (c) 525 (d) 225

Q.81. Which of the following can be expressed in the form of a standard quadratic equation?
Group D 30/08/2022 (Morning)
(a) $(2x - 1)^3 = x^2 - 3x + 2$
(b) $\sqrt{2x^2 + 3x - 4}$ - 2x + 5 = 0
(c) (x + 1)(x + 2) = x² - 16
(d) $(2x + 3)^2$ + 4x - 5 = (2x + 1)(2x - 3)

Q.82. Which of the following is reducible to a quadratic equation?

(A) $(m + 1) - \frac{1}{m+1} = 65$

(B) $x^2 + 3x = 2x^3 - 4x^2$

(C) $(a + b)^2 = \frac{3}{b}$

(D) $x + (3x - 2) = \frac{1}{x^2} - 6$

(a) A (b) D (c) B (d) C

Q.83. If 15 and -16 are roots of a quadratic equation, then the equation is:
Group D 30/08/2022 (Afternoon)
(a) $x^2 - x - 240 = 0$ (b) $x^2 + x - 240 = 0$
(c) $x^2 + x + 240 = 0$ (d) $x^2 - 2x + 240 = 0$

Q.84. Which of the following is a quadratic equation whose roots are $2 + \sqrt{3}$ and $4 - 2\sqrt{3}$?
Group D 30/08/2022 (Afternoon)
(a) $x^2 - (6 - \sqrt{3})x + 2 = 0$
(b) $3x^2 - (6 - \sqrt{3})x + 4 = 0$
(c) $2x^2 - (6 - \sqrt{3})x + 2 = 0$
(d) $x^2 - (12 - \sqrt{3})x + 2 = 0$

Q.85. Find the sum of the roots of $\sqrt{2}x^2 - 2\sqrt{5}x + \sqrt{3} = 0$.
Group D 30/08/2022 (Evening)
(a) $\sqrt{10}$ (b) $5\sqrt{2}$ (c) $-\sqrt{10}$ (d) $-2\sqrt{5}$

Q.86. Which of the following quadratic equations is satisfied by the roots 3 and -2?
Group D 01/09/2022 (Morning)
(a) $x^2 - x + 6 = 0$ (b) $x^2 + x - 6 = 0$
(c) $x^2 - x - 6 = 0$ (d) $x^2 + x + 6 = 0$

Q.87. The roots of $(x - 5)^2 = 5x + 11$ are _____.
Group D 01/09/2022 (Morning)
(a) 1 and 14 (b) 5 and 7
(c) 2 and -13 (d) 3 and 12

Q.88. Find the nature of roots of $2(p + q)^2x^2 + 2(p + q)x + 1 = 0$
Group D 01/09/2022 (Afternoon)
(a) Real and equal roots
(b) Imaginary roots
(c) Real roots
(d) Real and distinct roots

Q.89. If x = -1 and x = -2 are the solutions of the quadratic equation $3x^2 + px + q = 0$, then what is the value of (3p-2q)?
Group D 01/09/2022 (Afternoon)
(a) 17 (b) 12 (c) 13 (d) 15

Q.90. If α and β are the roots of the equation $6x^2 + x - 15 = 0$, where α > β then the value of (α - β) is:
Group D 01/09/2022 (Evening)
(a) $\frac{20}{3}$ (b) $\frac{19}{6}$ (c) $\frac{1}{6}$ (d) $\frac{1}{3}$

Q.91. If $x^2 - 4x + 4 = 0$, then the value of $x^3 + x^2 + \frac{1}{x} + \frac{1}{x^2}$ is:
Group D 01/09/2022 (Evening)
(a) 15.75 (b) 14.75 (c) 12.75 (d) 13.75

Q.92. If $x^2 - 2x + 1 = 0$, then it has:
Group D 01/09/2022 (Evening)
(a) five roots (b) two roots
(c) three roots (d) four roots

Q.93. Which of the following quadratic equations has one of its roots as $4 - 2\sqrt{5}$?
Group D 02/09/2022 (Morning)
(a) $x^2 - 8x + 4 = 0$ (b) $x^2 - 4x - 8 = 0$
(c) $x^2 - 4x + 4 = 0$ (d) $x^2 - 8x - 4 = 0$

Q.94. Find the values of b for which the quadratic equation $4x^2 + bx + 1 = 0$ has equal roots.
Group D 02/09/2022 (Afternoon)
(a) Only - 4 (b) - 4 and 4
(c) Only 4 (d) - 8 and 8

Q.95. If α and β, where α >β, are the roots of the equation $5x^2 - 3x - 2 = 0$, then what is the value of (α - 2β)?
Group D 02/09/2022 (Afternoon)
(a) $\frac{9}{5}$ (b) $\frac{1}{5}$ (c) $\frac{7}{5}$ (d) $\frac{11}{5}$

Q.96. If $x^2 + y^2 - 4x + 8y + 20 = 0$, then the value of $x^2 + y^2$ is:
Group D 02/09/2022 (Afternoon)
(a) 30 (b) 20 (c) 10 (d) 40

Q.97. If $\frac{(15x-9)}{x} + \frac{(15y-9)}{y} + \frac{(15z-9)}{z} = 0$, then the value of $\frac{1}{x} + \frac{1}{y} + \frac{1}{z}$ is :
Group D 02/09/2022 (Evening)
(a) 6 (b) 5 (c) 4 (d) 7

Q.98. A quadratic equation whose roots are $-\frac{2}{3}$ and $-\frac{3}{2}$ is:
Group D 02/09/2022 (Evening)
(a) $6x^2 - 13x - 1 = 0$ (b) $6x^2 - 13x + 6 = 0$
(c) $6x^2 + 13x + 6 = 0$ (d) $6x^2 + 13x + 1 = 0$

Q.99. For the equation $2x^2 + bx + 3 = 0$, the smaller root is 0.5. Find the value of b.
Group D 02/09/2022 (Evening)
(a) -7 (b) -2 (c) 1 (d) 5

Q.100. The value of $(\frac{x^b}{x^c})^{b+c} \times (\frac{x^c}{x^a})^{c+a} \times (\frac{x^a}{x^b})^{a+b}$ is equal to :
Group D 05/09/2022 (Morning)
(a) 3 (b) 2 (c) 1 (d) 0

Q.101. If $4^x - 4^{x-1} = 24$, then the value of $\frac{2x-1}{2x+3}$ is :
Group D 05/09/2022 (Morning)
(a) $\frac{1}{5}$ (b) $\frac{3}{7}$ (c) $\frac{1}{2}$ (d) $\frac{1}{3}$

Q.102. If $(-7)^{2k+1} (-7)^5 = (-7)^{12}$, then k is:
Group D 05/09/2022 (Afternoon)
(a) - 2 (b) 2 (c) 3 (d) - 3

Q.103. If a and b are the roots of the equation $x^2 + 3x - 4 = 0$, then the value of $\frac{1}{a} + \frac{1}{b} + ab$ is:
Group D 05/09/2022 (Afternoon)
(a) $\frac{12}{5}$ (b) $\frac{13}{4}$ (c) $-\frac{12}{5}$ (d) $-\frac{13}{4}$

Q.104. The roots of the quadratic equation $x^2 - 4x + 3 = 0$ are:
Group D 05/09/2022 (Evening)
(a) 1 and 3 (b) - 1 and 3
(c) - 1 and -3 (d) 1 and - 3

Q.105. The value of $(\frac{x^a}{x^b})^c \times (\frac{x^b}{x^c})^a \times (\frac{x^c}{x^a})^b$ is:
Group D 05/09/2022 (Evening)
(a) 2 (b) 3 (c) 1 (d) 0

Q.106. The common root of the quadratic equations $2x^2 - 5x - 3 = 0$ and $x^2 + x - 12 = 0$ is:
Group D 05/09/2022 (Evening)
(a) $-\frac{1}{2}$ (b) - 4 (c) 3 (d) 2

Q.107. If α and β are the roots of the equation $8x^2 + 22x - 21 = 0$, where β > α, then find the value of $(2\alpha + 3\beta)$.
Group D 06/09/2022 (Morning)
(a) $-\frac{19}{4}$ (b) $-\frac{21}{2}$ (c) $\frac{37}{2}$ (d) $\frac{21}{4}$

Q.108. Find the roots of the quadratic equation $x^2 - \frac{11x}{2} + 6 = 0$.
Group D 06/09/2022 (Morning)
(a) 2 and $\frac{3}{2}$ (b) $\frac{4}{3}$ and $\frac{3}{2}$
(c) 2 and $\frac{4}{3}$ (d) 4 and $\frac{3}{2}$

Q.109. If $P = \frac{x^4 - 8x}{2x^2 + 5x - 3} \times \frac{2x - 1}{x^2 + 2x + 4} \times \frac{x^2 - 9}{x^2 - 2x}$ then $(p^2 - 1)$ is equal to which of the following?
Group D 06/09/2022 (Morning)
(a) $x^2 - 6x + 8$ (b) $x^2 - 6x + 10$
(c) $x^2 + 6x + 10$ (d) $x^2 + 6x + 8$

Q.110. If a = 50, b = 20, then find the value of $a^3 + b^3$.
Group D 06/09/2022 (Morning)
(a) 2,03,000 (b) 1,56,000
(c) 1,33,000 (d) 1,75,000

Q.111. If the roots of the equation $2x^2$ + kx + 3 = 0 are real and equal, where k > 0, then the value of k will satisfy which of the following equations?
Group D 06/09/2022 (Afternoon)
(a) k^2 + √6k − 12 = 0 (b) k^2 + √3k - 6 = 0
(c) k^2 − √3k - 6 = 0 (d) k^2 − √6k − 12 = 0

Q.112. The roots of the equation $x^2 - 5x + 6 = 0$ are _____ .
Group D 06/09/2022 (Afternoon)
(a) - 2 , 3 (b) 2 , 3 (c) 2 , - 3 (d) - 2 , - 3

Q.113. If α and β are the roots of $x^2 - 5x + 3 = 0$, find the quadratic equation whose roots are α^2 and β^2.
Group D 06/09/2022 (Evening)
(a) x² + 19x - 9 = 0 (b) x² - 19x - 9 = 0
(c) x² - 19x + 9 = 0 (d) x² + 19x + 9 = 0

Q.114. If 2 and −3 are the roots of a quadratic equation, then that equation is _____.
Group D 06/09/2022 (Evening)
(a) x^2 + x + 6 = 0 (b) x^2 − x + 6 = 0
(c) x^2 − x − 6 = 0 (d) x^2 + x − 6 = 0

Q.115. Let P = $(\frac{1}{x} - \frac{1}{y})[(x+y)^2 - xy]$ + $(\frac{1}{x} + \frac{1}{y})[(x-y)^2 + xy]$ and Q = $\frac{y}{x}$ then P ÷ Q is equal to which of the following?
Group D 06/09/2022 (Evening)
(a) 2x (b) $\frac{x}{y}$ (c) $\frac{y}{x}$ (d) 2y

Q.116. If one root of the equation 4x² - 2x + k − 4 = 0 is reciprocal of the other, the value of k is:
Group D 08/09/2022 (Morning)
(a) - 4 (b) 4 (c) - 8 (d) 8

Q.117. If α, β (α > β) are the roots of the quadratic equation $x^2 - 10x + 16 = 0$, then the value of $\alpha^4 - \beta^4$ is:
Group D 08/09/2022 (Afternoon)
(a) 4080 (b) - 5080 (c) 5080 (d) - 4080

Q.118. Find the nature of the roots of $2x^2 + 4 - 10x = 0$.
Group D 08/09/2022 (Afternoon)
(a) Real and distinct roots
(b) No real roots
(c) Real and equal roots
(d) Imaginary roots

Q.119. Roots of the equation x² - 5x - 14= 0 are:
Group D 08/09/2022 (Evening)
(a) 7 , - 2 (b) 3 , - 2 (c) 5 , - 3 (d) 2 , - 7

Q.120. If x + y = 8, product of x and y is 15, then the value of $x^4 + y^4$ is:
Group D 08/09/2022 (Evening)
(a) 806 (b) 906 (c) 606 (d) 706

Q.121. If $x^4 + \frac{1}{x^4} = 27$, then what is the value of $x^2 + \frac{1}{x^2} = ?$
Group D 08/09/2022 (Evening)
(a) 31 (b) $\sqrt{29}$ (c) $\sqrt{31}$ (d) 29

Q.122. Which of the following statements is true about the nature of roots for the equation 2x² + 9x + 15 = 0?
Group D 09/09/2022 (Morning)
(a) Both roots are imaginary or non-real
(b) One root is positive real and one is negative real
(c) Both roots are negative real
(d) Both roots are positive real

Q.123. Solutions for the equation 11a² + 18a + 7 = 0 are:
Group D 09/09/2022 (Morning)
(a) - 1 , 2 (b) -1 , - 3
(c) - 2 , $\frac{-7}{11}$ (d) -1, $\frac{-7}{11}$

Q.124. If p + q + r = 13 and pq + qr + rp = 30, then the value of p³ + q³ + r³ − 3pqr is:
Group D 09/09/2022 (Afternoon)
(a) 1216 (b) 1027 (c) 1145 (d) 1125

Q.125. The quadratic equation with real coefficients which has real roots 4 and -5 is:
Group D 09/09/2022 (Afternoon)
(a) x² - 5x - 24 = 0 (b) x² + x - 20 = 0
(c) x ² - x - 30 = 0 (d) x² - 4x - 20 = 0

Q.126. Simplify (4x - 5y)² + (5x + 4y)² + (4x + 5y)(4x − 5y).
Group D 09/09/2022 (Afternoon)
(a) 57x² + 16y^2 (b) -57x² - 16y^2
(c) - 58x² + 16y^2 (d) 58x² + 16y^2

Q.127. Which of the following statements is true about the nature of roots for the equation x(x + 3) - 8 = 2(x + 3) (x − 3)?
Group D 09/09/2022 (Afternoon)
(a) Roots are irrational
(b) Two imaginary or non-real roots
(c) Two real and distinct roots
(d) Roots are real and equal

Q.128. The quadratic equation whose roots are 2 and - $\frac{1}{2}$ is:
Group D 09/09/2022 (Evening)
(a) 3x^2 - 3x - 2 = 0 (b) 5x^2 - 3x - 2 = 0
(c) 2x^2 - 5x - 2 = 0 (d) 2x^2 - 3x - 2 = 0

Q.129. If (a + b) = 11 and (a - b) = 3 then, the value of (a² + b²) is:
Group D 09/09/2022 (Evening)
(a) 65 (b) 70 (c) 75 (d) 63

Q.130. Roots of the equation x² = 24 - 10x are:
Group D 12/09/2022 (Morning)
(a) 2 , - 12 (b) 3 ,- 11 (c) 3 , - 12 (d) 2 , - 11

Q.131. If (a - b) = 8 and (a² + b²) = 160, then the value of ab is:
Group D 12/09/2022 (Morning)
(a) 32 (b) 40 (c) 36 (d) 48

Q.132. Which of the following statements is true about the nature of roots for the equation 11x² + 19x + 8 = 0?
Group D 12/09/2022 (Morning)
(a) Both roots are negative real
(b) One root is positive real, and one is negative real
(c) Both roots are imaginary or non - real
(d) Both roots are positive real

Q.133. The sum of two positive numbers is 34 and their product is 64. The positive difference between them is:
Group D 12/09/2022 (Morning)
(a) 40 (b) 30 (c) 50 (d) 60

Q.134. Roots of the equation x² + 2x - 6 = 0 are:
Group D 12/09/2022 (Afternoon)
(a) - 1 ± √7 (b) - 3 ± √7
(c) - 1 ± √5 (d) - 2 ± √7

Q.135. Which of the following statements is true about the nature of roots for the equation x² + x + 12 = 0 ?
Group D 12/09/2022 (Evening)
(a) Both roots are positive real
(b) One root is imaginary, and one is real
(c) Both roots are negative real
(d) Both roots are imaginary or non-real

Q.136. The quadratic equation for which, sum of the roots is (- $\frac{3}{5}$) and product of the roots is $\frac{2}{5}$, is:
Group D 12/09/2022 (Evening)
(a) 5x^2 - 2x + 7 = 0 (b) 5x^2 - 7x + 2 = 0
(c) 5x^2 - 3x + 2 = 0 (d) 5x^2 - x + 1 = 0

Q.137. Which of the following represents the equation (x + 2)³ = x (x² - 1) in standard form?

Group D 13/09/2022 (Morning)
(a) $x^2 + 12x + 8 = 0$ (b) $4x^2 + 10x + 7 = 0$
(c) $6x^2 + 11x + 6 = 0$ (d) $6x^2 + 13x + 8 = 0$

Q.138. Which of the following describes the nature of the roots of the quadratic equation $4x^2 - 7\sqrt{3}x + 12 = 0$?
Group D 13/09/2022 (Afternoon)
(a) One real root and one imaginary root
(b) Two distinct real roots
(c) No real roots
(d) Two equal roots

Q.139. The discriminant of the equation $4x^2 - 5x - 3 = 0$ is:
Group D 13/09/2022 (Evening)
(a) 73 (b) - 73 (c) 23 (d) - 23

Q.140. $16x^2 + 4y^2 + 25z^2 - 16xy + 20yz - 40zx$ is equal to:
Group D 13/09/2022 (Evening)
(a) $(4x + 2y - 5z)^2$ (b) $(4x - 2y + 5z)^2$
(c) $(4x + 2y + 5z)^2$ (d) $(4x - 2y - 5z)^2$

Q.141. What is value of k is if
$\frac{2^{-2k} \times 4^{k+3}}{4^{-k+2}} = 2^{k-2}$
Group D 14/09/2022 (Morning)
(a) 1 (b) - 4 (c) - 1 (d) 2

Q.142. The value of
$(x - y)(x + y) + (y - z)(y + z) + (z + x)(z - x)$ is
Group D 14/09/2022 (Morning)
(a) x + y + z (b) 1
(c) 0 (d) $x^2 + y^2 + z^2$

Q.143. The roots of the quadratic equation $x^2 - 10x + 21 = 0$ are:
Group D 14/09/2022 (Morning)
(a) 7, 3 (b) 3, - 7 (c) -7, - 3 (d) 7, - 3

Q.144. Find the value of y if
$\frac{1}{(125)^{-y}} = \frac{1}{(5)^{-4y+1}}$
Group D 14/09/2022 (Morning)
(a) $\frac{1}{3}$ (b) 1 (c) 5 (d) - 1

Q.145. If $\frac{5^{3n+2}}{5^{4n-1}} = 25$, then n =_____.
Group D 14/09/2022 (Afternoon)
(a) - 1 (b) 5 (c) 2 (d) 1

Q.146. The roots of the quadratic equation $x^2 + 10x + 21 = 0$ are:
Group D 14/09/2022 (Afternoon)
(a) 7, 3 (b) 3, - 7 (c) 7, - 3 (d) - 3 , - 7

Q.147. Evaluate 999^3.
Group D 14/09/2022 (Evening)
(a) 997002999 (b) 997003999
(c) 997004999 (d) 997005999

Q.148. Factorise $49a^2 + 70ab + 25b^2$.
Group D 14/09/2022 (Evening)
(a) $(5a - 7b)^2$ (b) $(7a + 5b)^2$
(c) $(5a + 7b)^2$ (d) $(7a - 5b))^2$

Q.149. The roots of the equation $\sqrt{3}x^2 - 8x + 5\sqrt{3} = 0$ are:
Group D 14/09/2022 (Evening)
(a) $\sqrt{3}, \frac{-5}{\sqrt{3}}$ (b) $-\sqrt{3}, \frac{-5}{\sqrt{3}}$
(c) $-\sqrt{3}, \frac{5}{\sqrt{3}}$ (d) $\sqrt{3}, \frac{5}{\sqrt{3}}$

Q.150. If -(2/3) is a root of the equation $kx^2 - 13x - 10 = 0$, then the value of k is:
Group D 14/09/2022 (Evening)
(a) 3 (b) 1 (c) 2 (d) 4

Q.151. The value of $\frac{(0.064) + (0.008)}{0.16 + 0.04 - 0.08}$ is
Group D 14/09/2022 (Evening)
(a) 0.05 (b) 1.4 (c) 0.6 (d) 2.7

Q.152. Write the expanded form of $(3a + 4b + 5c)^2$.
Group D 15/09/2022 (Morning)
(a) $9a^2 + 16b^2 + 25c^2 + 24ab + 40bc + 60ac$
(b) $9a^2 + 16b^2 + 25c^2 + 24ab + 40bc + 30ac$
(c) $9a^2 + 16b^2 + 25c^2 + 24ab + 40bc + 50ac$
(d) $9a^2 + 16b^2 + 25c^2 + 24ab + 40bc + 40ac$

Q.153. The positive square root of
$(\frac{2+\sqrt{3}}{2-\sqrt{3}} + \frac{2-\sqrt{3}}{2+\sqrt{3}} + 11)$ is _____.
Group D 15/09/2022 (Morning)
(a) $5 - \sqrt{3}$ (b) $2 + \sqrt{3}$ (c) $2\sqrt{3}$ (d) 5

Q.154. The quadratic equation $x^2 + 7x - 60$ has :
Group D 15/09/2022 (Morning)
(a) No real roots
(b) Two equal roots
(c) two real and unequal roots
(d) two equal imaginary roots

Q.155. The value
of $(\frac{y^{b+c}}{y^{2a}})(\frac{y^{c+a}}{y^{2b}})(\frac{y^{a+b}}{y^{2c}})$ is_____.
Group D 15/09/2022 (Afternoon)
(a) y^{abc} (b) $y^{\frac{ab}{c}}$ (c) 0 (d) 1

Q.156. The equation $(x + 1)^2 - 2(x + 1) = 0$ has:
Group D 15/09/2022 (Afternoon)
(a) two equal roots (b) two real roots
(c) one real root (d) no real roots

Q.157. The positive square root of $(6 + 2\sqrt{3})(6 - 2\sqrt{3})$ is _____.
Group D 15/09/2022 (Evening)
(a) 12 (b) $2\sqrt{6}$ (c) 24 (d) $6\sqrt{2}$

Q.158. Evaluate $984^2 - 16^2$.
Group D 15/09/2022 (Evening)
(a) 969000 (b) 966660
(c) 967000 (d) 968000

Q.159. Which of the following describes the nature of the roots of the quadratic equation $3x^2 - 4x + 10 = 0$?
Group D 15/09/2022 (Evening)
(a) No real roots
(b) One real root and one imaginary root
(c) Two equal roots
(d) Two distinct real roots

Q.160. If α, β are the roots of the quadratic equation $x^2 - 11x + 18 = 0$, then the value of $\alpha^2 + \beta^2$ is:
Group D 16/09/2022 (Morning)
(a) 75 (b) 85 (c) 95 (d) 105

Q.161. If α , β are the roots of the quadratic equation $2x^2 - 3x - 35 = 0$, then the value of $\alpha^3 + \beta^3$ is:
Group D 16/09/2022 (Afternoon)
(a) $\frac{757}{8}$ (b) $\frac{657}{8}$ (c) $\frac{857}{8}$ (d) $\frac{957}{8}$

Q.162. if $25 - (x^2 - 9) = (81)^{1/2}$, then the positive value of x = _____.
Group D 16/09/2022 (Afternoon)
(a) 5 (b) 2 (c) 4.7 (d) 2.5

Q.163. Which of the following is the standard representation of quadratic equation
$(x^2 + 1)(x - 1) = (x^2 - 3)(x + 3)$?
Group D 16/09/2022 (Evening)
(a) $x^2 - 3x - 4 = 0$ (b) $4x^2 - x - 6 = 0$
(c) $4x^2 - 8 = 0$ (d) $4x^2 - 4x - 8 = 0$

Q.164. The discriminant of a quadratic equation is 0. The quadratic equation has:
Group D 17/09/2022 (Morning)
(a) two equal real roots
(b) no real roots
(c) three distinct real roots
(d) two distinct real roots

Q.165. The value of the discriminant of the quadratic equation $2x^2 - 4x - 3 = 0$ is
Group D 17/09/2022 (Afternoon)
(a) 24 (b) 36 (c) 40 (d) 16

Q.166. If α, β be the roots of the quadratic equation $3x^2 - 9x + 8 = 0$, then the value of
$(\frac{\alpha}{\beta} + \frac{\beta}{\alpha}) + 4(\frac{1}{\alpha} + \frac{1}{\beta})$ is:
Group D 17/09/2022 (Afternoon)
(a) 6.125 (b) 7.225 (c) 4.825 (d) 5.875

Q.167. The roots of the quadratic

equation $X + \frac{10}{X} = 7$ are:
Group D 17/09/2022 (Evening)
(a) - 2 , 5 (b) 5 , 2 (c) 2 , - 5 (d) - 5 , 1

Q.168. if $\frac{c}{d} + \frac{d}{c} = 1$, then the value of $\frac{c^3 - d^3}{dc^2 - cd^2}$ is :
Group D 18/09/2022 (Morning)
(a) - 1 (b) 1 (c) 0 (d) 2

Q.169. The roots of quadratic equation $3x^2 - 2\sqrt{6}x + 2 = 0$
Group D 18/09/2022 (Morning)
(a) $\frac{\sqrt{1}}{\sqrt{3}}, \frac{\sqrt{1}}{\sqrt{3}}$ (b) $\frac{\sqrt{5}}{\sqrt{3}}, \frac{\sqrt{5}}{\sqrt{3}}$
(c) $\frac{\sqrt{2}}{\sqrt{3}}, \frac{\sqrt{2}}{\sqrt{3}}$ (d) $\frac{\sqrt{5}}{\sqrt{3}}, \frac{\sqrt{2}}{\sqrt{3}}$

Q.170.The quadratic equation whose roots are $\frac{1}{\sqrt{2}}$ and $\frac{1}{\sqrt{2}}$ is:
Group D 18/09/2022 (Morning)
(a) $2x^2 - 2\sqrt{2}x + 2 = 0$
(b) $2x^2 - 3\sqrt{2}x + 2 = 0$
(c) $2x^2 - 3\sqrt{2}x + 1 = 0$
(d) $2x^2 - 2\sqrt{2}x + 1 = 0$

Q.171. The sum of roots of $X^2 - px + q = 0$ is _____.
Group D 18/09/2022 (Morning)
(a) – p (b) $\frac{1}{p}$ (c) p (d) q

Q.172. If 3 is root of the equation $x^2 - px + 15 = 0$ and the quadratic equation $x^2 + px + q = 0$ has equal roots, then the value of q is
Group D 18/09/2022 (Evening)
(a) 16 (b) 12 (c) 64 (d) 32

Q.173. Which of the following is a quadratic equation written in standard form?
Group D 18/09/2022 (Evening)
(a) $5x^2 + 3x - 1 = 0$ (b) $5x^2 + 3x = \frac{1}{x}$
(c) $x^{-2} + 7x = 8$ (d) $x^3 + 5x^2 + 3 = x^4$

Q.174. Factorise $(64x^6 - y^6)$.
Group D 19/09/2022 (Morning)
(a) $(2x - y)(2x + y)(4x^2 - 2xy + y^2)$ $(4x^2 - 2xy - y^2)$
(b) $(2x - y)(2x + y)(4x^2 + 2xy + y^2)$ $(4x^2 - 2xy + y^2)$
(c) $(2x - y)(2x + y)(4x^2 + 2xy + y^2)$ $(4x^2 - 2xy - y^2)$
(d) $(2x - y)(2x + y)(4x^2 + 2xy - y^2)$ $(4x^2 - 2xy + y^2)$

Q.175. Which of the following is the standard representation of quadratic equation (x - 4)(x + 1) = 2?
Group D 19/09/2022 (Morning)
(a) $x^2 - 3x - 6 = 0$
(b) $x^2 - 4x - 2 = 0$
(c) $x^2 - x - 2 = 0$
(d) $x^2 - 3x - 4 = 0$

Q.176. What kind of roots does the quartic equation $5x^2 + 7x + 4 = 0$ have?
Group D 19/09/2022 (Morning)
(a) No real roots
(b) Only one real root
(c) Real and equal roots
(d) Real and unequal roots

Q.177. The equation$(x + 1)^3 - (x - 1)^3 = 0$ is:
Group D 19/09/2022 (Afternoon)
(a) a linear equation with real roots
(b) a quadratic equation with real roots
(c) a quadratic equation with non-real roots
(d) a linear equation with non-real roots

Q.178. If α , β are the roots of $px^2 + qx + r = 0$, then $\alpha^2 + \beta^2$= _____.
Group D 19/09/2022 (Afternoon)
(a) $\frac{q^2 + 2pr}{p^2}$ (b) $\frac{q^2 - 2qr}{p^2}$
(c) 2pq (d) - 2pq

Q.179. If $a^2 - 4a + 1 = 0$, find $a^2 + \frac{1}{a^2}$.
Group D 19/09/2022 (Afternoon)
(a) 14 (b) 16 (c) 18 (d) 12

Q.180. $a = \frac{x}{2x + y + z} = \frac{y}{x + 2y + z} = \frac{z}{x + y + 2z}$, then find the value of a :
Group D 19/09/2022 (Afternoon)
(a) $\frac{3}{2}$ (b) $\frac{1}{4}$ (c) $\frac{1}{2}$ (d) $\frac{2}{5}$

Q.181. Which of the options given below correctly describes the nature of the roots of the quadratic equation $x^2 + 4\sqrt{3}x + 3 = 0$?
Group D 19/09/2022 (Evening)
(a) irrational and equal
(b) irrational and unequal
(c) rational and equal
(d) rational and unequal

Q.182. The roots of $2^{2x} - 10 \times 2^x + 16 = 0$ are:
Group D 19/09/2022 (Evening)
(a) 2 , 3 (b) 1 , 8 (c) 2 , 8 (d) 1 , 3

Q.183. The positive root of $4x^2 - 1 = 0$ is;
Group D 20/09/2022 (Morning)
(a) $\frac{1}{2}$ (b) $\frac{1}{4}$ (c) 1 (d) 2

Q.184. If one of the roots of a quadratic equation with rational coefficients is $2 + \sqrt{3}$, then the quadratic equation is given as
Group D 20/09/2022 (Morning)
(a) $x^2 = 2 - \sqrt{3}$ (b) $x^2 - 4x + 1 = 0$
(c) $x^2 + 4x - 1 = 0$ (d) $x^2 - 2 = 0$

Q.185. If $(x + y + z) = 0$ and $x^2 + y^2 + z^2 = 36$, then the value of xy + yz + zx is:
Group D 20/09/2022 (Morning)
(a) - 18 (b) - 6 (c) 18 (d) - 28

Q.186. The value of $(x^{\frac{2}{3}} - x^{\frac{1}{3}}y^{\frac{1}{3}} + y^{\frac{2}{3}})(x^{\frac{1}{3}} + y^{\frac{1}{3}})$ *is* ___
Group D 20/09/2022 (Morning)
(a) $x - y$ (b) $\frac{1}{x} + \frac{1}{y}$
(c) $\frac{1}{x} - \frac{1}{y}$ (d) $x + y$

Q.187. If the two roots of a quadratic equation are -3 and 3, then the quadratic equation is given as_____.
Group D 20/09/2022 (Afternoon)
(a) $x^2 + 5 = 0$ (b) $9x^2 - 1 = 0$
(c) $x^2 - 9 = 0$ (d) $x^2 - 6 = 0$

Q.188. If a,b are the roots of the $x^2 - 5x + 6 = 0$, then $a^2 + b^2 - ab$ is :
Group D 20/09/2022 (Evening)
(a) – 7 (b) 9 (c) 7 (d) 43

Q.189. The product of the roots of $6\sqrt{3}x^2 + 3\sqrt{3} + 5x = 0$ is
Group D 20/09/2022 (Evening)
(a) $\frac{1}{2}$ (b) 1 (c) $\sqrt{3}$ (d) 0

Q.190. An equation, whose roots are the reciprocals of the roots of the equation $5x^2 - 3x - 4 = 0$, is:
Group D 22/09/2022 (Morning)
(a) $4x^2 - 3x - 5 = 0$
(b) $4x^2 + 3x - 5 = 0$
(c) $4x^2 - 3x + 5 = 0$
(d) $4x^2 - 3x + 5 = 0$

Q.191. Which of the options below is equivalent to $8x^2 + 27y^3 + 36x^2y + 54xy^2$.
Group D 22/09/2022 (Morning)
(a) $(4x + 3y)^3$ (b) $(2x + 3y)^3$
(c) $(3x + 2y)^3$ (d) $(2x + 5y)^3$

Q.192. If the sum of the roots of a quadratic equation is -7 and product of the roots of the same equation is-12, then the quadratic equation is given as _____.
Group D 22/09/2022 (Morning)
(a) $x^2 + 7x - 12 = 0$
(b) $x^2 + 7x + 12 = 0$
(c) $x^2 - 7 = 0$
(d) $x^2 - 12 = 0$

Q.193. Simplify the given expression.
$(x-y)^3 + (x+y)^3 + 3(x-y)(x^2-y^2) + 3(x+y)(x^2-y^2)$
Group D 22/09/2022 (Morning)
(a) $6x^3$ (b) $4x^3$ (c) x^3 (d) $8x^3$

Q.194. If a + b + c = 0, then the roots of the equation $ax^2 + bx + c = 0$ are
Group D 22/09/2022 (Afternoon)
(a) 1 , $\frac{c}{a}$ (b) 2 , $\frac{c}{a}$
(c) -1 , $\frac{c}{a}$ (d) -2, $\frac{c}{a}$

Q.195. For the equation (x + 4) (x - 4) = 0, the value of the discriminant is equal to _____.
Group D 22/09/2022 (Afternoon)
(a) - 4 (b) 0 (c) 64 (d) 16

Q.196. Simplify $(7x-1)^3 + (7x+1)^3$.
Group D 22/09/2022 (Evening)
(a) $-686x^3 + 42x$ (b) $-686x^3 - 42x$
(c) $686x^3 - 42x$ (d) $686x^3 + 42x$

Q.197. Determine the positive value of 'k' for which the equations $x^2 + kx + 64 = 0$ and $x^2 - 8x + k = 0$ will both have real roots.
Group D 22/09/2022 (Evening)
(a) 15 (b) 17 (c) 16 (d) 14

Q.198. The sum of the roots of the equation $x^2 + 3a^2 = 4ax$ is:
Group D 22/09/2022 (Evening)
(a) 2a (b) a (c) 4a (d) 3a

Q.199. If -2 is a root of the equation $3x^2 + px + 2 = 0$, and $7x^2 + px + k = 0$ has equal roots, then what is the value of k?
Group D 26/09/2022 (Morning)
(a) $\frac{2}{3}$ (b) $\frac{7}{4}$ (c) $\frac{7}{2}$ (d) $\frac{4}{3}$

Q.200. If the roots of the quadratic equation x² - kx + 169 = 0 are equal, find the value of k.
Group D 26/09/2022 (Morning)
(a) ± 26 (b) ± 14 (c) ± 13 (d) ± 17

Q.201. Expand $(\frac{1}{2}x + 3y - \frac{1}{3}z)^2$.
Group D 26/09/2022 (Morning)
(a) $\frac{1}{4}x^2 + 9y^2 - \frac{1}{9}z^2 - 3xy - 2yz - \frac{xz}{3}$
(b) $\frac{1}{4}x^2 + 9y^2 - \frac{1}{9}z^2 + 3xy - 2yz - \frac{xz}{3}$
(c) $\frac{1}{4}x^2 + 9y^2 + \frac{1}{9}z^2 + 3xy - 2yz - \frac{xz}{3}$
(d) $\frac{1}{4}x^2 + 9y^2 + \frac{1}{9}z^2 - 3xy + 2yz + \frac{xz}{3}$

Q.202. If α and β are the roots of the equation $2x^2 - 3x - 5 = 0$ then the quadratic equation whose roots are $\frac{\alpha}{\beta}$ and $\frac{\beta}{\alpha}$ is :
Group D 26/09/2022 (Afternoon)
(a) $10x^2 + 29x - 10 = 0$
(b) $10x^2 - 29x + 10 = 0$
(c) $10x^2 - 29x - 10 = 0$
(d) $10x^2 + 29x + 10 = 0$

Q.203. Find the sum of the roots of the quadratic equation x² + 19x + 60 = 0.
Group D 26/09/2022 (Evening)
(a) - 19 (b) 19 (c) $\frac{1}{19}$ (d) - $\frac{19}{60}$

Q.204. A quadratic equation whose roots are and $\frac{5}{3}$ and $-\frac{3}{4}$ is :
Group D 27/09/2022 (Morning)
(a) 12x² - 11x - 15 = 0
(b) 6x² - 11x - 15 = 0
(c) 6x² + 11x - 15 = 0
(d) 12x² + 22x - 15 = 0

Q.205. If 2 is a root of the equation x² - px + 6 = 0 and the quadratic equation x² + 2px + q = 0 has equal roots, then the value of q is:
Group D 27/09/2022 (Morning)
(a) 25 (b) 36 (c) 12 (d) 16

Q.206. Simplify the given equation.
$(x^2 + xy + y^2)^2 - (x^2 - xy + y^2)^2$
Group D 27/09/2022 (Morning)
(a) $4xy(x^2 + y^2)$ (b) $4xy(x^2 - y^2)$
(c) $2xy(x^2 - y^2)$ (d) $2xy(x^2 + y^2)$

Q.207. Simplify
$\frac{(5p-q)^3 - (3p-2q)^3 - (q+2p)^3}{13pq - 15p^2 - 2q^2}$
Group D 27/09/2022 (Afternoon)
(a) $-6p + 3q$ (b) $6p + 3q$
(c) $-6p - 3q$ (d) $6p - 3q$

Q.208. If r and s are the roots of $x^2 - 3x + 2 = 0$, then the quadratic equation in x whose roots are $r^2 + s^2$ and $(rs)^2$ is:
Group D 27/09/2022 (Afternoon)
(a) $x^2 + 9x - 20 = 0$
(b) $x^2 + 9x + 20 = 0$
(c) $x^2 - 9x + 20 = 0$
(d) $x^2 - 9x - 20 = 0$

Q.209. Simplify the given expression.
$(y-z)^3 + (z-x)^3 + (x-y)^3$
Group D 27/09/2022 (Evening)
(a) 3(x - y) (y - z)(x - z)
(b) 3(x - y) (y - z) (z + x)
(c) (x - y) (y - z) (z - x)
(d) 3(x - y)(y - z)(z - x)

Q.210. If $x = b + c$, $y = c - a$, $z = a - b$, then find the value of $x^2 + y^2 + z^2 - 2xy - 2xz + 2yz$
Group D 27/09/2022 (Evening)
(a) $4b^2$ (b) $4a^2$ (c) $4c^2$ (d) $2b$

Q.211. Which of the following represents a quadratic equation?
Group D 27/09/2022 (Evening)
(a) (x + 7) 4 = 14
(b) 3x + 7 = 7x³
(c) 5x² + 4x - 2 = 7x
(d) 4x² + 6x + 5 = 4x (x + 1)

Q.212. Simplify the given expression
$[(x-y) + \frac{y^2}{x+y}] \div [x^2 + y^2 + \frac{y^4}{x^2-y^2}] \times \frac{y^2}{x-y}$
Group D 27/09/2022 (Evening)
(a) $\frac{x^2}{y^2}$ (b) $\frac{x^2-y^2}{x^2y^2}$ (c) $\frac{y^2}{x^2}$ (d) x^2

Q.213. If x = $\frac{2}{3}$ is one of the solutions of the quadratic equation $7x^2$ + kx - 3 = 0, then the value of k satisfies the equation.
Group D 27/09/2022 (Evening)
(a) $6k^2 - 3k - 1 = 0$
(b) $12k^2 + 4k - 1 = 0$
(c) $6k^2 - 5k + 1 = 0$
(d) $12k^2 - 4k - 1 = 0$

Q.214. Simplify the given expression.
x² + 3x + 12 − 2(x³ − x + 4)
Group D 28/09/2022 (Morning)
(a) 4 + 5x − x² − 2x³ (b) 4 + 5x + x² + 2x³
(c) 4 − 5x + x² − 2x³ (d) 4 + 5x + x² − 2x³

Q.215. If p and q are the roots of $x^2 + 4x - 21 = 0$ and p<q, then the quadratic equation in x whose roots are (p - 1) and (q + 1) is:
Group D 28/09/2022 (Morning)
(a) x^2 + 6x + 16 = 0 (b) x^2 + 6x - 16 = 0
(c) x^2 + 4x − 32 = 0 (d) x² + 4x + 32 = 0

Q.216. If a and b are the roots of the equation $x^2 - 5x - 6 = 0$, then the value of $(a - b)^2$ is:
Group D 28/09/2022 (Morning)
(a) 24 (b) 49 (c) 18 (d) 25

Q.217. If the quadratic equation $ax^2 - 4x + 1 = 0$ has equal roots, then the value of a is :
Group D 28/09/2022 (Afternoon)
(a) 2 (b) 1 (c) 3 (d) 4

Q.218. If $x + y = 5$ and $xy = 4$, find the value of $x^3 + y^3$.
Group D 28/09/2022 (Afternoon)
(a) 125 (b) 65 (c) 185 (d) 60

Q.219. The roots of the quadratic equation $x + \frac{20}{x} = 9$ are:
Group D 28/09/2022 (Evening)
(a) 4 , 5 (b) $-4, -5$ (c) 3 , 6 (d) $-3, -6$

Q.220. If α and β are the roots of the equation $x^2 + 5x + 6 = 0$, then the value of $\alpha\beta - (\frac{1}{\alpha} + \frac{1}{\beta})$ is:
Group D 28/09/2022 (Evening)
(a) $-\frac{31}{6}$ (b) $\frac{31}{6}$ (c) $\frac{41}{6}$ (d) $-\frac{41}{6}$

Q.221. If the difference between two numbers is 4 and their product is 32, then the absolute difference between their cubes is:
Group D 28/09/2022 (Evening)
(a) 444 (b) 484 (c) 844 (d) 448

Q.222. If 2 and -3 are the roots of a quadratic equation, then the quadratic equation is:
Group D 29/09/2022 (Morning)
(a) $x^2 + x + 6 = 0$ (b) $x^2 - x - 6 = 0$
(c) $x^2 + x - 6 = 0$ (d) $x^2 - x + 6 = 0$

Q.223. Which of the options below give the solution to the equation $\frac{1}{x+3} + \frac{1}{x+5} = \frac{1}{6}$?
Group D 29/09/2022 (Morning)
(a) $x = 2 \pm \sqrt{37}$ (b) $x = 2 \pm \sqrt{39}$
(c) $x = 3 \pm \sqrt{37}$ (d) $x = 4 \pm \sqrt{37}$

Q.224. Simplify the given expression.
$2(2x - 3) + 4(\frac{x^2}{2} - 3x + 4)$
Group D 29/09/2022 (Morning)
(a) $2x^2 - 8x + 10$ (b) $2x^2 + 8x + 10$
(c) $2x^2 + 8x - 10$ (d) $2x^2 - 8x - 10$

Q.225. If $4^{3x} - 8^{x+1} + 16 = 0$ is written as a quadratic equation where $y = 2^{3x}$, then which of the options below will represent the quadratic equation mentioned above?
Group D 29/09/2022 (Morning)
(a) $4y^2 - 8y + 16 = 0$
(b) $y^2 - 8y + 16 = 0$
(c) $4y^2 - 4y + 16 = 0$
(d) $y^2 - 4y + 16 = 0$

Q.226. If a = $28 - 5\sqrt{12}$ and b = $2 + \sqrt{3}$, find the value of ($a\sqrt{3} + b$)
Group D 29/09/2022 (Afternoon)
(a) $31 - 8\sqrt{3}$ (b) $32 + 27\sqrt{3}$
(c) $-30 + 30\sqrt{3}$ (d) $-28 + 29\sqrt{3}$

Q.227. If $x \neq y$, $and\ x^2y - xy^2 : yz(x - y) :: xa^2 - xb^2 : w$, then which of the options below gives an expression equivalent to w ?
Group D 29/09/2022 (Afternoon)
(a) $za^2 - zb^2$ (b) $a^2 - b^2$
(c) $za^2 + zb^2$ (d) $yza^2 - yzb^2$

Q.228. Identify the quadratic equation one of whose roots is $4 + \sqrt{3}$.
Group D 29/09/2022 (Afternoon)
(a) $x^2 - 8x + 11 = 0$
(b) $x^2 + 8x + 11 = 0$
(c) $x^2 + 8x + 13 = 0$
(d) $x^2 - 8x + 13 = 0$

Q.229. If $3 + 2\sqrt{2}$ and $3 - 2\sqrt{2}$ are the roots of a quadratic equation, then the quadratic equation is :
Group D 29/09/2022 (Evening)
(a) $x^2 - 6x + 1 = 0$
(b) $x^2 - 6x - 1 = 0$
(c) $x^2 + 6x + 1 = 0$
(d) $x^2 + 6x - 1 = 0$

Q.230. If $2xy^2 : 2x^2y :: 2x^2y : z$, which of the options given below gives an expression equivalent to z?
Group D 29/09/2022 (Evening)
(a) $2x^3$ (b) $2x^2$ (c) $4x^2y^2$ (d) $4xy$

Q.231. If one root of the equation $(k + 1)x^2 - 13kx + 7 - 2k = 0$ is the reciprocal of the other, then the value of k is :
Group D 29/09/2022 (Evening)
(a) -2 (b) 2 (c) -4 (d) 4

Q.232. If $x = \sqrt{13 + 2\sqrt{40}}$ and $y = \sqrt{13 - 2\sqrt{40}}$, then what is the value of $(x - y)$?
Group D 29/09/2022 (Evening)
(a) $3\sqrt{2}$ (b) $6\sqrt{2}$ (c) $2\sqrt{5}$ (d) $4\sqrt{5}$

Q.233. If a = $(\frac{3}{7})^2 \div (\frac{9}{7})^0$ $then\ find\ the\ value\ of$, a^{-2}
Group D 30/09/2022 (Afternoon)
(a) $\frac{2401}{81}$ (b) $\frac{81}{2401}$ (c) $\frac{343}{81}$ (d) $\frac{81}{343}$

Q.234. Solve the given equation.
$(5x^2 - 5) + 5(-x^2 + 2x - 7) = 0$
Group D 30/09/2022 (Afternoon)
(a) x = 4 (b) $x = 2$
(c) $x = -4$ (d) $x = -2$

Q.235. If $x = 2$ then find the value of $\sqrt{(4x)(x) + 4x + 1} + 5x$
Group D 30/09/2022 (Afternoon)
(a) 13 (b) 15 (c) 9 (d) 17

Q.236. The value of the discriminant of the quadratic equation $9x + 2x^2 = 5$ is:
Group D 30/09/2022 (Evening)
(a) 41 (b) 184 (c) -176 (d) 121

Q.237. The sum of a number and its reciprocal is - 2. Find the quadratic equation associated with the situation and also the number.
Group D 06/10/2022 (Morning)
(a) $x^2 + 2x + 1 = 0$, x = 1
(b) $x^2 + 2x - 1 = 0$, x = - 1
(c) $x^2 + 2x + 1 = 0$, x = − 1
(d) $x^2 - 2x + 1 = 0$, x = - 1

Q.238. The value of $(x^{\frac{2}{3}} - x^{\frac{-2}{3}})(x^{\frac{4}{3}} + 1 + x^{\frac{-4}{3}})$ is ____.
Group D 06/10/2022 (Afternoon)
(a) $\frac{1}{x^2}$ (b) 0 (c) x^2 (d) $x^2 - \frac{1}{x^2}$

Q.239. If 4a + 3b = 2c, then find $(4a)^3 + (3b)^3 + (-2c)^3$.
Group D 06/10/2022 (Afternoon)
(a) − 72abc (b) 0 (c) 72abc (d) 1

Q.240. Find the quadratic equation whose roots are $\sqrt{3} + 1$ and $\sqrt{3} - 1$
Group D 06/10/2022 (Afternoon)
(a) $x^2 + 2\sqrt{3}x + 2 = 0$
(b) $x^2 - 2\sqrt{3}x + 4 = 0$
(c) $x^2 - 2\sqrt{3}x + 2 = 0$
(d) $x^2 + \sqrt{3}x + 2 = 0$

Q.241. $x^4 - (x^2 - 2)^2 + (2 - x) = 0$ is
Group D 06/10/2022 (Afternoon)
(a) a quadratic equation
(b) just a number
(c) a bi - quadratic equation
(d) a linear equation

Q.242. A quadratic equation whose roots are m and n, is:
Group D 06/10/2022 (Evening)
(a) $x^2 - (m + n)x - mn = 0$
(b) $x^2 + (m + n)x + mn = 0$
(c) $x^2 - (m - n)x + mn = 0$
(d) $x^2 - (m + n)x + mn = 0$

Q.243. Factorise: $y^3 - xy^2 - x^2y + x^3$
Group D 07/10/2022 (Morning)
(a) $(y - x)^2 (y + x)$
(b) $(y - x)^2 (y - x)$
(c) $(y - x)\ (y^2 + x^2)$
(d) $(y + x)^2 (y-x)$

Q.244. $(x + 2y - 3z)^2$ is equal to:
Group D 07/10/2022 (Morning)
(a) $x^2 + 4y^2 + 4xy - 12yz - 6xz$
(b) $x^2 + 4y^2 - 4xy - 12yz - 6xz$
(c) $x^2 + 4y^2 + 9z^2 + 4xy + 12yz - 6xz$
(d) $x^2 + 4y^2 + 9z^2 + 4xy - 12yz + 6xz$

Q.245. If x − y = 9 and xy = 16, find the value of x² + y².
Group D 07/10/2022 (Afternoon)
(a) 113 (b) 32 (c) 49 (d) 115

Q.246. If u − v = 4 and uv = 20, then the value of u³ − v³ is:
Group D 07/10/2022 (Afternoon)
(a) 64 (b) 176 (c) 224 (d) 304

Q.247. The product of two consecutive odd numbers is 1155. Represent the situation in the form of a quadratic equation, if x smaller of the two numbers.
Group D 07/10/2022 (Afternoon)
(a) $x^2 - 2x - 1155 = 0$
(b) $x^2 + 2x + 1155 = 0$
(c) $x^2 + x + 1155 = 0$
(d) $x^2 + 2x - 1155 = 0$

Q.248. If u + v = − 2 and u² + v² = 16, then the value of (u − v)² is:
Group D 07/10/2022 (Evening)
(a) 8 (b) 14 (c) 28 (d) 16

Q.249. Simplify $(x + 1)(x - 1)(x^2 + 1)$
Group D 07/10/2022 (Evening)
(a) $(x^2 - 1)$ (b) $x^4 + x^3 + x - 1$
(c) $x^4 - 1$ (d) $x^4 + 1$

Q.250. If a and b are the roots of the quadratic equation (x − m)(x − n) = k, then the roots of the equation (x − a)(x − b) = −k are:
Group D 07/10/2022 (Evening)
(a) m , n (b) a , n (c) a + 1 , b +1 (d) m , b

Q.251. If the sum of a number and its reciprocal is 7, then which of the options below can be such a number ?
Group D 11/10/2022 (Morning)
(a) $\frac{7 + 3\sqrt{5}}{2}$ (b) $\frac{-7 + 3\sqrt{5}}{2}$
(c) $\frac{3 + 7\sqrt{5}}{2}$ (d) $\frac{3 - 7\sqrt{5}}{2}$

Q.252. If the sum of two numbers is 25 and the product is 136, then the sum of their cubes is:
Group D 11/10/2022 (Morning)
(a) 4524 (b) 4525 (c) 5524 (d) 5425

Q.253. Simplify the following.
$(y^2x)^4 \times (y^2x)^{-4}$, $x \neq 0$, $y \neq 0$.
Group D 11/10/2022 (Morning)
(a) 0 (b) $(y^2x)^8$ (c) 1 (d) $(y^2x)^{-16}$

Q.254. Simplify the given expression.
$2(x^2 + y^2)^2 - 3xy(x^2 + y^2) - 2x^2y^2$
Group D 11/10/2022 (Afternoon)
(a) $(x^2 + y^2 - xy)(2x^2 + 2y^2 - xy)$
(b) $(2x^2 + 2y^2 + xy)(x^2 + y^2 - 2xy)$
(c) $(x^2 + y^2 + xy)(2x^2 + 2y^2 + xy)$
(d) $(2x^2 + 2y^2 - xy)(x^2 + y^2 - 2xy)$

Q.255. Simplify the given expression.
$\frac{z(x^3 - y^3)}{x^2 + xy + y^2} + \frac{x(y^3 - z^3)}{y^2 + yz + z^2} + \frac{y(z^3 - x^3)}{z^2 + zx + x^2}$
Group D 11/10/2022 (Afternoon)
(a) $x - y - z$ (b) 0
(c) $x^2 + y^2 + z^2$ (d) $x + y + z$

Q.256. If a and b are the roots of the equation x² + 5x + 4= 0, then the value of $\frac{a^3 + b^3}{a^2 + b^2 - 4}$ is:
Group D 11/10/2022 (Afternoon)
(a) −6 (b) −5 (c) −4 (d) −7

Q.257. Simplify the given expression.
$\frac{x^2 + 3x - 10}{x^2 - 25} \times \frac{x^2 + 3x + 2}{x^2 - 4} \times \frac{x(x + 2)}{(x + 1)^2 + (x + 1)}$
Group D 11/10/2022 (Afternoon)
(a) $\frac{x - 5}{x}$ (b) $\frac{x + 5}{x}$ (c) $\frac{x}{x + 5}$ (d) $\frac{x}{x - 5}$

Q.258. The roots of the quadratic equation $x^2 - 6x + 5 = 0$ are:
Group D 11/10/2022 (Evening)
(a) 5 , 1 (b) − 5 , − 1 (c) −3,−2 (d) 3 , 2

Q.259. Simplify the following $\frac{(3x^2)^5}{(6x^{-2})^2}$
Group D 11/10/2022 (Evening)
(a) $\frac{81x^{14}}{36}$ (b) $\frac{27x^{14}}{4}$ (c) $\frac{81x^6}{36}$ (d) $\frac{27x^6}{36}$

RRB NTPC CBT - 2
(09/05/2022 to 17/06/2022)

Q.260. If y= $\sqrt[3]{6}$ − 4, then what is the value of $y^3 + 12y^2 + 48y + 100$?
Level 6 (09/05/2022) Shift 1
(a) 42 (b) 0 (c) 106 (d) 6

Q.261. If $x = \frac{2 + \sqrt{3}}{2 - \sqrt{3}}$, then the value of $(x - 7)^2$ is:
Level 6 (09/05/2022) Shift 2
(a) 48 (b) $2\sqrt{3}$ (c) $4\sqrt{3}$ (d) 24

Q.262. If $6y^2$ - 13y + 6 = 0, Then find the product of the two roots of the equation.
Level 5 (12/06/2022) Shift 1
(a) -1 (b) 1 (c) - $\frac{13}{6}$ (d) $\frac{13}{6}$

Q.263. If $x^4 - 6x^2 - 1 = 0$, then what is the value of $(x^6 - x^{-6}) - 3(x^4 + x^{-4})$?
Level 2 (13/06/2022) Shift 1
(a) 178 (b 156 (c) 120 (d) 148

Q.264. What is the sum of the solutions of the equation $2y^2 - 6y - 7 = 0$?
Level 3 (14/06/2022) Shift 1
(a) $-\frac{7}{2}$ (b) −3 (c) 3 (d) $\frac{7}{2}$

Q.265. If (y + z) = 8 and yz = 6 , find the value of $(y - z)^2$.
Level 5 (15/06/2022) Shift 3
(a) 40 (b) 44 (c) 49 (d) 36

Q.266. if x(x + y + z) = 30, y(x + y + z) = 64, z(x + y + z) = 50, then find the value of 2(x + y + z), where x,y,z > 0.
Level 5 (15/06/2022) Shift 3
(a) 20 (b) 22 (c) 24 (d) 26

Q.267. Which of the quadratic equations below will not have real roots?
Level 2 (16/06/2022) Shift 2
(a) $x^2 + 4x + 4 = 0$ (b) $x^2 + 4x + 5 = 0$
(c) $x^2 + 4x - 4 = 0$ (d) $x^2 + 4x - 5 = 0$

Q.268. If x + $\frac{1}{x}$ = 4 then find the value of the following: $\frac{4x^2 + 4}{9x^2 + 10x + 9}$
Level 2 (16/06/2022) Shift 2
(a) 1 (b) $\frac{8}{23}$ (c) $\frac{4}{9}$ (d) $\frac{8}{22}$

Q.269. If (y + z) = 25 and $(y^2 - z^2)$ = 225, what is the value of z?

Level 3 (17/06/2022) Shift 1
(a) 9 (b) 7 (c) 10 (d) 8

Q.270. If the roots of the equation $2x^2$ - 3x + a = 0 are in the ratio 1 : 2, then find the value of a.
Level 3 (17/06/2022) Shift 2
(a) - 1 (b) - 2 (c) 2 (d) 1

Q.271. The roots of the equation 9 $(X + 9)^2$= 441 are:
Level 3 (17/06/2022) Shift 3
(a) 2,16 (b) 12,21 (c) -12,-21 (d) -2,-16

RRB NTPC CBT - 1 (28/12/2020 to 31/07/2021)

Q.272. If $a^3 - b^3$ = 625, $a^2 - b^2$= 25 and $a + b$ = 5, then the value of $a^2 + ab + b^2$ is
RRB NTPC 28/12/2020 (Morning)
(a) 125 (b) 25 (c) 5 (d) 150

Q.273. If x satisfies the equation x^2 - 2x + 1 = 0, then the value of $x^3 - \frac{1}{x^3}$ is
RRB NTPC 28/12/2020 (Evening)
(a) 1 (b) -1 (c) $\frac{1}{3}$ (d) 0

Q.274. If a + b = 8 and a² + b² = 12, then the value of a³ + b³ is
RRB NTPC 29/12/2020 (Evening)
(a) 1136 (b) -211 (c) 716 (d) -112

Q.275. Solve the following.
(x - y)³ + (y - z)³ + (z - x)³ = ?
RRB NTPC 30/12/2020 (Morning)
(a) 3(x - y) (y - z) (z - x)
(b) (x - y) (y - z) (z - y)
(c) (x + y + z)(x² + y² + z²)
(d) 3xyz

Q.276. If $\sqrt{1225 \times \sqrt{32 \div x}} = 70$. Find the value of x.
RRB NTPC 30/12/2020 (Evening)
(a) 8 (b) 2 (c) 16 (d) 4

Q.277. If $x^4 + \frac{1}{x^4}$ = 194, Find $x^3 + \frac{1}{x^3}$
RRB NTPC 30/12/2020 (Evening)
(a) 56 (b) 52 (c) 54 (d) 62

Q.278. If a + b = 10 and $a^2 + b^2$= 68, find $a^3 + b^3$?
RRB NTPC 30/12/2020 (Evening)
(a) 520 (b) 560 (c) 620 (d) 540

Q.279. If $x^2y^2 + \frac{1}{x^2y^2}$= 83, then the value of $xy - \frac{1}{xy}$ is
RRB NTPC 04/01/2021 (Morning)
(a) 10 (b) 9 (c) 85 (d) 81

Q.280. If x and y are two positive numbers such that $\sqrt{x}$ = 8 and x^2+ y = 4112, then find the value of $\sqrt{y}$.
RRB NTPC 04/01/2021 (Evening)
(a) 6 (b) 16 (c) 2 (d) 4

Q.281. If x = 2 and y = 5, evaluate 5xy - y^2.
RRB NTPC 05/01/2021 (Morning)
(a) 20 (b) 25 (c) 40 (d) 0

Q.282. If $\frac{1}{5\sqrt{2} - 7}$ = a$\sqrt{2} + b$, then the value of a and b are
RRB NTPC 05/01/2021 (Evening)
(a) -7, 5 (b) 5, 7 (c) 7, 5 (d) 5, -7

Q.283. $8m^3 - n^3$ is equal to
RRB NTPC 05/01/2021 (Evening)
(a) (2m - n) (4m^2 + 4mn + n^2)
(b) (2m - n) (4m^2 + 2mn + n^2)
(c) (2m - n) (4m^2 - 2mn + n^2)
(d) (2m - n) (4m^2 - 4mn + n^2)

Q.284. One root of the equation 2x^2- 8x - m = 0, is $\frac{5}{2}$. The other root of the equation and the value of m are respectively
RRB NTPC 07/01/2021 (Morning)
(a) $\frac{5}{2}$ and $-\frac{15}{2}$ (b) $\frac{3}{2}$ and $-\frac{15}{2}$
(c) $-\frac{5}{2}$ and $\frac{15}{2}$ (d) $-\frac{3}{2}$ and $\frac{15}{2}$

Q.285. If $P = 2 + \sqrt{3}$, $Q = 2 - \sqrt{3}$, then $\frac{P}{Q}$ = ?
RRB NTPC 07/01/2021 (Morning)
(a) $\frac{7 + 4\sqrt{3}}{1}$ (b) $4\sqrt{6} + 5$
(c) $7 - 2\sqrt{6}$ (d) $4\sqrt{3} - 5$

Q.286. If $x\sqrt{12} = 4 + x\sqrt{3}$, then the value of x is:
RRB NTPC 07/01/2021 (Morning)
(a) $\frac{4}{\sqrt{3}}$ (b) $\sqrt{3}$ (c) - $\sqrt{3}$ (d) $2\sqrt{3}$

Q.287. If -5 is a root of the quadratic equation 2x² + px − 15 = 0 and also of the quadratic equation P(kx² + x) = 0, then what is the value of p and k?
RRB NTPC 08/01/2021 (Morning)
(a) 7, 0.2 (b) 7, -0.2 (c) -7, 0.4 (d) -7, -0.2

Q.288. If $a^2 + b^2$ = 82 and ab = 9, find the value of $a^3 + b^3$
RRB NTPC 08/01/2021 (Evening)
(a) 750 (b) 730 (c) 720 (d) 830

Q.289. If $x^4 + x^{-4}$ = 1154. Then the value of $x + x^{-1}$ is
RRB NTPC 08/01/2021 (Evening)
(a) 8 (b) 6 (c) 5 (d) 12

Q.290. If a =17, b =15, c = $\frac{1}{4}$ of -128, then what is the value of $a^3 + b^3 + c^3$- 3abc?
RRB NTPC 10/01/2021 (Evening)
(a) 3 (b) 2 (c) 0 (d) 1

Q.291. If $x = 2 - \sqrt{3}$ then $x - \frac{1}{x}$ is:
RRB NTPC 10/01/2021 (Evening)
(a) 12 - 30$\sqrt{3}$ (b) 5$\sqrt{3}$ (c) -2$\sqrt{3}$ (d) 3$\sqrt{3}$

Q.292. If $a = \frac{\sqrt{3}+1}{\sqrt{3}-1}$ and b = $\frac{\sqrt{3}-1}{\sqrt{3}+1}$ then find the value of $a^2 + b^2 - 4$.
RRB NTPC 11/01/2021 (Morning)
(a) 12 (b) 11 (c) 14 (d) 10

Q.293. If sum of squares of zeros of the polynomial $x^2 + 9x + 3K$ is 21, then what is the value of k?
RRB NTPC 11/01/2021 (Evening)
(a) 30 (b) 20 (c) -17 (d) 10

Q.294. If α and β are the zeros of the polynomial $x^2 - 5x +$ m such that $\alpha - \beta = 1$, then what will be the value of m.
RRB NTPC 12/01/2021 (Morning)
(a) 3 (b) 2 (c) 6 (d) 10

Q.295. If the roots of the equation $(4 + m)x^2 + (m + 1)x + 1 = 0$ are equal, then find the values of m.
RRB NTPC 12/01/2021 (Evening)
(a) m = 5, -3 (b) m = -1, -3
(c) m = 2, 3 (d) m = 0,5

Q.296. Which of the following is valid for (a + b)² = a² + b²
RRB NTPC 13/01/2021 (Morning)
(a) May be true for only a finite number of (a, b)
(b) Cannot be true for any set of (a, b)
(c) May be true for exactly one pair (a, b)
(d) May be true for infinite number of (a, b)

Q.297. Determine the values of a and b for which the following system of equations has infinite solutions.
2x - (a - 4)y = 2b + 1, 4x - (a - 1)y = 5b - 1
RRB NTPC 13/01/2021 (Evening)
(a) a = 7 and b = 3 (b) a = 7 and b = 1
(c) a = 5 and b = 2 (d) a = 2 and b = 7

Q.298. If α and β are the zeros of the polynomial f(x) = kx² + 4x +4 such that α² + β² = 24, then find the positive value of k.
RRB NTPC 13/01/2021 (Evening)

(a) $\frac{4}{3}$ (b) $\frac{1}{3}$ (c) $\frac{3}{4}$ (d) $\frac{2}{3}$

Q.299. Find the value of x such that the expression (12.95 × 12.95 + 12.95 × x + 0.03 × 0.03) will be a perfect square.
RRB NTPC 13/01/2021 (Evening)
(a) 0.015 (b) 0.06 (c) 0.006 (d) 0.6

Q.300. If the sum of the squares of zeros of quadratic polynomial f(x) = x^2 - 8x + k is 40, then the value of k.
RRB NTPC 16/01/2021 (Morning)
(a) 11 (b) 12 (c) 10 (d) 14

Q.301. If $x^2 + 1 = 2x$, then find $x - (\frac{1}{x})$
RRB NTPC 16/01/2021 (Evening)
(a) 0 (b) 2 (c) 4 (d) 12

Q.302. If the equation x^2 + ax + b = 0 and x^2 + bx + a = 0 have a common root, then find the value of a + b (where a is not equal to b.)
RRB NTPC 18/01/2021 (Morning)
(a) 0 (b) 2 (c) 1 (d) -1

Q.303. If x = $\sqrt{3} + \sqrt{2}$, then the value of $x^2 + \frac{1}{x^2}$ is:
RRB NTPC 19/01/2021 (Evening)
(a) 12 (b) 14 (c) $2\sqrt{3}$ (d) 10

Q.304. The value of $4x^4 + 9y^2 - 12x^2y$ at x = 5 and y = 2 is.
RRB NTPC 19/01/2021 (Evening)
(a) 1936 (b) 1660 (c) 2500 (d) 2536

Q.305. The Value of $16x^4 + 25y^2 - 40x^2y$ at x = 5 and y = 2 is
RRB NTPC 20/01/2021 (Morning)
(a) 12100 (b) 8100 (c) 10000 (d) 9000

Q.306. In the expression of $(x + 3)^3$, the coefficient of x is:
RRB NTPC 20/01/2021 (Evening)
(a) 9 (b) 1 (c) 18 (d) 27

Q.307. What is the value of x, if
- 3 × $\sqrt{196}$ + $\sqrt{x}$ = 8 × 3 - 2
RRB NTPC 21/01/2021 (Morning)
(a) 4096 (b) 128 (c) 135 (d) 1064

Q.308. If $\frac{\sqrt{5} + \sqrt{2}}{\sqrt{5} - \sqrt{2}}$ = a + b$\sqrt{10}$, then Which of the following is correct?
RRB NTPC 22/01/2021 (Evening)
(a) a = $\frac{1}{3}$, b = $\frac{2}{3}$ (b) a = $\frac{7}{3}$, b = $\frac{1}{3}$
(c) a = b = $\frac{1}{3}$ (d) a = $\frac{7}{3}$, b = $\frac{2}{3}$

Q.309. The sum of two numbers is 75 and the difference of their squares is 300. Find the difference between the two numbers.
RRB NTPC 23/01/2021 (Morning)
(a) 4 (b) 3 (c) 5 (d) 6

Q.310. If $\frac{x}{5} = \frac{y}{6} = \frac{z}{11}$, then $\frac{x + y + z}{z}$ is equal to:
RRB NTPC 23/01/2021 (Morning)
(a) 5 (b) 3 (c) 2 (d) 4

Q.311. The product of (1 - $\frac{1}{x + 1}$) (1 - $\frac{1}{x + 2}$) (1 - $\frac{1}{x + 3}$) … ….(1 - $\frac{1}{2x}$) is:
RRB NTPC 23/01/2021 (Morning)
(a) $\frac{x - 1}{2x}$ (b) $\frac{1}{2}$ (c) $\frac{2x + 1}{2x}$ (d) $\frac{3}{2}$

Q.312. Find the value of $a^2 + b^2 + c^2 - 2ab + 2ac - 2bc$, $if\ a = x + y,\ b = x - y$ and $c = 2x - 1$
RRB NTPC 25/01/2021 (Morning)
(a) 0 (b) $(2x + 2y - 1)^2$
(c) $(2x - 2y - 1)^2$ (d) $(x - y - 1)^2$

Q.313. If $\frac{\sqrt{7} + \sqrt{2}}{\sqrt{7} - \sqrt{2}} = x + y\sqrt{14}$, Find the value of y.
RRB NTPC 25/01/2021 (Morning)
(a) $\frac{6}{5}$ (b) $\frac{4}{5}$ (c) $\frac{3}{5}$ (d) $\frac{2}{5}$

Q.314. If x = $\frac{\sqrt{3} + 1}{\sqrt{3} - 1}$ and y = $\frac{\sqrt{3} - 1}{\sqrt{3} + 1}$, then find the value of $x^2 + y^2$.
RRB NTPC 27/01/2021 (Evening)
(a) 10 (b) 16 (c) 14 (d) 12

Q.315. If $\frac{3\sqrt{2} - 2\sqrt{3}}{3\sqrt{2} + 2\sqrt{3}}$ = a + b$\sqrt{6}$, then find the value of b.
RRB NTPC 27/01/2021 (Evening)
(a) -5 (b) 5 (c) 2 (d) -2

Q.316. If x^2 = y + z, y^2 = z + x and z^2 = x + y, then find the value of $\frac{1}{x+1} + \frac{1}{y+1} + \frac{1}{z+1}$.
RRB NTPC 28/01/2021(Morning)
(a) 4 (b) -1 (c) 2 (d) 1

Q.317. If $\frac{3\sqrt{5} - 5}{3\sqrt{5} + 5}$ = a + b$\sqrt{5}$, then find the value of b?
RRB NTPC 28/01/2021(Morning)
(a) $\frac{7}{2}$ (b) $\frac{3\sqrt{5}}{2}$ (c) $\frac{3}{2}$ (d) - $\frac{3}{2}$

Q.318. If $x^4 + \frac{1}{x^4} = 322\ and\ x > 1$, then what is the value of $x^3 - \frac{1}{x^3}$?
RRB NTPC 28/01/2021 (Evening)
(a) 72 (b) 78 (c) 76 (d) 74

Q.319. If $\sqrt{\frac{x}{144}} = \frac{27}{12}$, find the value of x
RRB NTPC 28/01/2021 (Evening)
(a) 727 (b) 724 (c) 629 (d) 729

Q.320. If x + $\frac{1}{x}$ = 5 , Then the value of $\frac{3x}{2x^2 + 2 - 5x}$ will be:
RRB NTPC 29/01/2021 (Morning)
(a) $\frac{5}{3}$ (b) $\frac{3}{5}$ (c) $\frac{2}{3}$ (d) $\frac{2}{5}$

Q.321. Find the value of x in the given equation. $\frac{\sqrt{2401}}{x} = \frac{x}{6.25}$
RRB NTPC 29/01/2021 (Evening)
(a) 15.5 (b) 17.5 (c) 27.5 (d) 7.5

Q.322. If a + b + c = 0, then find the value of $\frac{(a^2 + b^2 + c^2)^2}{a^2b^2 + b^2c^2 + c^2a^2}$
RRB NTPC 30/01/2021 (Morning)
(a) 2 (b) 0 (c) 1 (d) 4

Q.323. If $\frac{2\sqrt{2} + \sqrt{7}}{2\sqrt{2} - \sqrt{7}} = x + y\sqrt{14}$, Find the value of y.
RRB NTPC 30/01/2021 (Morning)
(a) 4 (b) 0 (c) 19 (d) 15

Q.324. If $a^{\frac{1}{3}}$ = 6, then find the value of a^2 - 36a.
RRB NTPC 30/01/2021 (Evening)
(a) 7776 (b) 38880 (c) - 180 (d) 0

Q.325. If x = 7 + $4\sqrt{3}$ then find the value of $\sqrt{x} + \frac{1}{\sqrt{x}}$
RRB NTPC 30/01/2021 (Evening)
(a) $4\sqrt{2}$ (b) 6 (c) $1 + \sqrt{2}$ (d) 4

Q.326. The possible value of x in the equation $\sqrt{\frac{x}{1-x}} + \sqrt{\frac{1-x}{x}} = \frac{25}{12}$.
RRB NTPC 02/02/2021 (Morning)
(a) $\frac{8}{25}$ or $\frac{17}{25}$ (b) $\frac{9}{25}$ or $\frac{16}{25}$
(c) $\frac{19}{25}$ or $\frac{6}{25}$ (d) $\frac{12}{25}$ or $\frac{13}{25}$

Q.327. If x + y + z = 0, then what will be the value of $\frac{x^2}{yz} + \frac{y^2}{zx} + \frac{z^2}{xy}$?
RRB NTPC 02/02/2021 (Morning)

(a) $\frac{x^2y^2z^2}{x}$ (b) 3

(c) $\frac{3x^2+3y^2+3z^2}{x}$ (d) $x^2+y^2+z^2$

Q.328. Solve the following:

$(1+\frac{1}{x})(1+\frac{1}{x+1})(1+\frac{1}{x+2})$

$(1+\frac{1}{x+3})$ = ?

RRB NTPC 02/02/2021 (Morning)

(a) $1+\frac{1}{x+4}$ (b) $x+4$ (c) $\frac{1}{x}$ (d) $\frac{x+4}{x}$

Q.329. If the sum of three numbers is zero, then which of the options below will always be equal to the value of the sum of the cubes of those numbers?

RRB NTPC 02/02/2021 (Evening)

(a) One

(b) three times the product of the three numbers

(c) product of the three numbers

(d) zero

Q.330. The pair of equations $2^{x+y} = 16$ and $64^{x-y} = 2$, has :

RRB NTPC 03/02/2021 (Morning)

(a) Unique Solution x = $\frac{23}{12}$, y = $\frac{25}{12}$

(b) Infinite Solutions

(c) No Common Solution

(d) Unique Solution x= $\frac{25}{12}$, y= $\frac{23}{12}$

Q.331. What is the square root of the following ?

$(x^2-14x+49)(x^2+6x+9)$

RRB NTPC 03/02/2021 (Evening)

(a) (x – 4)(x + 9) (b) (x – 7)(x + 3)

(c) (x –1)(x + 17) (d) (x – 3)(x + 8)

Q.332. If x = 12 and y = 7 , then the value of $(\frac{x^2+y^2-xy}{x^3+y^3})$ is:

RRB NTPC 04/02/2021 (Morning)

(a) $\frac{2}{19}$ (b) $\frac{1}{19}$ (c) $\frac{1}{2}$ (d) $\frac{1}{5}$

Q.333. If 11= $\frac{11x}{1-x}$, then the value of $(2x)^2$ *is*:

RRB NTPC 04/02/2021 (Morning)

(a) 4 (b) 2 (c) 3 (d) 1

Q.334. Which of the following is a factor of the polynomial x^2 - x - 20 ?

RRB NTPC 05/02/2021 (Morning)

(a) x + 2 (b) x - 5 (c) x - 4 (d) x + 5

Q.335. Find the value of x.

if $\frac{x}{\sqrt{128}} = \frac{\sqrt{162}}{x}$

RRB NTPC 05/02/2021 (Morning)

(a) 144 (b) 196 (c) 14 (d) 12

Q.336. The sum of two numbers is 27 and the difference of their squares is 243. What is the difference between the numbers?

RRB NTPC 05/02/2021 (Morning)

(a) 9 (b) 72 (c) 42 (d) 3

Q.337. If $\frac{4}{5}$ + (- $\frac{3}{10}$)= x + $1\frac{1}{2}$, then what will be the value of x?

RRB NTPC 05/02/2021 (Morning)

(a) -2 (b) -1 (c) 2 (d) 1

Q.338. The sum of two numbers is 30. If the sum of their reciprocals is $\frac{6}{25}$, find the two numbers.

RRB NTPC 08/02/2021 (Morning)

(a) 7 and 23 (b) 5 and 25

(c) 11 and 19 (d) 9 and 21

Q.339. The sum of two numbers is 20 and their product is 96. What is the difference between the two numbers?

RRB NTPC 08/02/2021 (Evening)

(a) 4 (b) 5 (c) 8 (d) 6

Q.340. Find the value of X if

$\sqrt{1+\frac{x}{144}} = \frac{13}{12}$.

RRB NTPC 08/02/2021 (Evening)

(a) 30 (b) 16 (c) 25 (d) 20

Q.341. If x × y = x + y + $\sqrt{xy}$, then the value of 6 × 24 will be:

RRB NTPC 08/02/2021 (Evening)

(a) 43 (b) 41 (c) 42 (d) 44

Q.342. The roots of the equations x^2 - 7x + 12 = 0 are:

RRB NTPC 08/02/2021 (Evening)

(a) 3, 4 (b) 5, 6 (c) 2, 3 (d) 7, 8

Q.343. Solve the following.

$(\frac{1}{5}x - \frac{1}{6}y)(5x+6y)$= ?

RRB NTPC 09/02/2021 (Morning)

(a) $x^2 + \frac{11xy}{30} - y^2$

(b) $x + \frac{11xy}{30} - y^2$

(c) $x^2 + \frac{11xy}{30} - y$

(d) y^2

Q.344. If a + b + c = 8 and both b and c are positive integers greater than zero, then the maximum value 'a' can take is:

RRB NTPC 09/02/2021 (Evening)

(a) 6 (b) 10 (c) 8 (d) 0

Q.345. If 1.5x = 0.04y, then what will be the value of $(\frac{y-x}{y+x})$?

RRB NTPC 10/02/2021 (Morning)

(a) $\frac{73}{77}$ (b) $\frac{70}{77}$ (c) $\frac{77}{73}$ (d) $\frac{72}{77}$

Q.346. If 3a = 4b = 6c and a + b + c = $27\sqrt{29}$, then what will be the value of $\sqrt{a^2+b^2+c^2}$?

RRB NTPC 10/02/2021 (Morning)

(a) $3\sqrt{81}$ (b) 81 (c) 85 (d) 87

Q.347. Select the term that can replace the question mark (?) in the following equation.

$(2a^3-3)(5a^3-2) = 10a^6 + ? + 6$

RRB NTPC 10/02/2021 (Morning)

(a) 19 a^2 (b) -19 a^3 (c) 19 a^3 (d) 19

Q.348. If $\frac{144}{0.144} = \frac{14.4}{x}$, then what is the value of x?

RRB NTPC 10/02/2021 (Evening)

(a) 0.144 (b) 0.01044

(c) 0.0144 (d) 0.00144

Q.349. If $\frac{x}{y} = \frac{6}{5}$, then the value of $\frac{x^2+y^2}{x^2-y^2}$ is

RRB NTPC 11/02/2021 (Morning)

(a) $\frac{61}{11}$ (b) $\frac{60}{11}$ (c) $\frac{11}{61}$ (d) $\frac{60}{34}$

Q.350. If x = $\frac{\sqrt{3}+1}{\sqrt{3}-1}$ and y = $\frac{\sqrt{3}-1}{\sqrt{3}+1}$, then the value of x^2 + $y^2$is:

RRB NTPC 11/02/2021 (Evening)

(a) 14 (b) 13 (c) 10 (d) 15

Q.351. If y = 26, then what is the value of $y\sqrt{y^3-y^2}$?

RRB NTPC 11/02/2021 (Evening)

(a) 3280 (b) 3380 (c) 3580 (d) 3480

Q.352. If $2\frac{1}{2}$ + $3\frac{1}{2}$ + $4\frac{1}{2}$ = x, then what will be the value of x - $5\frac{1}{2}$?

RRB NTPC 12/02/2021 (Morning)

(a) 6 (b) 5 (c) 4 (d) 8

Q.353. If $\frac{x-y}{3} = \frac{x+y}{5} = \frac{xy}{8}$, then find the value of xy.

RRB NTPC 15/02/2021 (Morning)

(a) 14 (b) 16 (c) 18 (d) 12

Q.354. If $\sqrt{x} + \frac{2}{5} \times 70 = 20 \times \frac{1}{4} \times 7$, then the value of x is :

RRB NTPC 15/02/2021 (Morning)

(a) 50 (b) 48 (c) 46 (d) 49

Q.355. The sum of two numbers is 20 and the difference between their squares

is 80. Select the two numbers from the given options.
RRB NTPC 15/02/2021 (Morning)
(a) 15,5 (b) 11,9 (c) 13,7 (d) 12,8

Q.356. If $x^2 - 1$ is a factor of $ax^4 + bx^3 + cx^2 + dx + e$, then which of the following is a possible relation between the coefficients of powers of x.
RRB NTPC 15/02/2021 (Evening)
(a) a + c + e = b + d (b) a + b + c = d + e
(c) b + c + d = a + e (d) a + b + e = c + d

Q.357. If $x > 1$, and $x + \frac{1}{x} = \sqrt{29}$, what is the value of $x - \frac{1}{x}$?
RRB NTPC 15/02/2021 (Evening)
(a) 4 (b) 2 (c) 5 (d) 3

Q.358. If (x + y) : (x - y) = 7 : 3 , then find $(x^2 + y^2) : (x^2 - y^2)$
RRB NTPC 16/02/2021 (Morning)
(a) 21:29 (b) 20:29 (c) 29:21 (d) 10:4

Q.359. If 2x - 3y = 7, and $\frac{x}{x+y} = \frac{5}{6}$ then what is the value of x - y?
RRB NTPC 16/02/2021 (Morning)
(a) 4 (b) 7 (c) 6 (d) $\frac{1}{5}$

Q.360. If a = $\frac{3+\sqrt{5}}{3-\sqrt{5}}$ and b = $\frac{3-\sqrt{5}}{3+\sqrt{5}}$, then find the value of $a^2 + b^2$ - ab
RRB NTPC 16/02/2021 (Morning)
(a) 46 (b) 41 (c) 42 (d) 40

Q.361. Solve the given equation.
$\frac{3+\sqrt{5}}{3-\sqrt{5}} + \frac{3-\sqrt{5}}{3+\sqrt{5}} + \frac{\sqrt{5}-1}{\sqrt{5}+1}$ = ?
RRB NTPC 16/02/2021 (Evening)
(a) $\frac{17-\sqrt{5}}{2}$ (b) $\frac{13-\sqrt{5}}{2}$
(c) $\frac{15-\sqrt{5}}{2}$ (d) $\frac{16-\sqrt{5}}{2}$

Q.362. If a² + b² + c² + 3 = 2(a + b + c) then the value of (a + b + c) is...
RRB NTPC 17/02/2021 (Morning)
(a) 2 (b) 3 (c) 5 (d) 4

Q.363. If $x^3 - 9x^2 - 26x - 24 = 0$, then which of the values of x given in the options will provide an INCORRECT solution to the given equation?
RRB NTPC 17/02/2021 (Evening)
(a) 3 (b) 4 (c) 2 (d) 1

Q.364. If x² - 3x + 1 = 0, then the value of x² + x + $(\frac{1}{x}) + (\frac{1}{x^2})$ is:
RRB NTPC 22/02/2021 (Evening)
(a) 2 (b) 10 (c) 6 (d) 8

Q.365. If x = $\frac{\sqrt{5}+1}{\sqrt{5}-1}$ and y = $\frac{1}{x}$, then what will be the value of x² + y² ?
RRB NTPC 22/02/2021 (Evening)
(a) 4 (b) 6 (c) 7 (d) 5

Q.366. If a = 0.1 + $\sqrt{0.9}$ and b = 0.1 - $\sqrt{0.9}$ then what will be the value of a² + b²?
RRB NTPC 22/02/2021 (Evening)
(a) 2.82 (b) 1.82 (c) 1.9 (d) 2

Q.367. If x = $\frac{\sqrt{3}}{2}$, then find the value of $\sqrt{1+x} + \sqrt{1-x}$.
RRB NTPC 27/02/2021 (Morning)
(a) 2 + $\sqrt{3}$ (b) 2 - $\sqrt{3}$ (c) $\frac{\sqrt{3}}{2}$ (d) $\sqrt{3}$

Q.368. If a + b + c = 3, a² + b² + c² = 6 and $\frac{1}{a} + \frac{1}{b} + \frac{1}{c}$ = 1, where a, b and c ≠ 0, then abc = ?
RRB NTPC 27/02/2021 (Morning)
(a) 1 (b) $\frac{5}{2}$ (c) $\frac{1}{2}$ (d) $\frac{3}{2}$

Q.369. If a = 2b = 3c and a + b + c = 121 then $\sqrt{a^2 + b^2 + c^2}$ is:
RRB NTPC 27/02/2021 (Evening)
(a) 75 (b) 77 (c) 73 (d) 72

Q.370. If x + y + z = 0, then the value of $\frac{x^2}{yz} + \frac{y^2}{zx} + \frac{z^2}{xy}$ is:
RRB NTPC 27/02/2021 (Evening)
(a) 2 (b) 4 (c) 3 (d) 1

Q.371. What is the value of the following expression:
(1 + x)(1 + x²)(1 + x^4)(1 + x^8)$(1 - x)$
RRB NTPC 27/02/2021 (Evening)
(a) (1 - x^{16}) (b) (1 + x^{16})
(c) $(1 - x)^8$ (d) $(1 - x)^4$

Q.372. If a = $\frac{b^2}{(b-a)}$, then the value of $a^3 + b^3$ is:
RRB NTPC 01/03/2021 (Morning)
(a) 1 (b) 2 (c) 0 (d) 6

Q.373. If 3x + y = 5 and 4x - 3y = 2, then the ratio x: y is.
RRB NTPC 01/03/2021 (Evening)
(a) 17 : 14 (b) 13 : 14 (c) 17 : 13 (d) 7 : 17

Q.374. If y + $\frac{1}{z}$ = 1 and x + $\frac{1}{y}$ = 1, then what is the value of xyz?
RRB NTPC 01/03/2021 (Evening)
(a) 0 (b) -1 (c) 2 (d) 1

Q.375. If ab = 10 and a² + b² = 29, then (a - b)² = ?
RRB NTPC 02/03/2021 (Morning)
(a) 9 (b) 3 (c) 19 (d) 39

Q.376. If $(\sqrt{5} + 1)^2 = a + b\sqrt{5}$, then find a, b where (a>b)
RRB NTPC 02/03/2021 (Morning)
(a) 8, 6 (b) 6, 4 (c) 6, 2 (d) 4, 2

Q.377. If 2x - 3y = -1 and $\frac{x}{x+y} = \frac{7}{12}$, then the value of 2xy is...
RRB NTPC 02/03/2021 (Evening)
(a) 60 (b) 70 (c) 65 (d) 75

Q.378. If x = 3 and y = 5, then the value of (4x² + 4xy + y²) is....
RRB NTPC 03/03/2021 (Morning)
(a) 121 (b) 49 (c) 120 (d) 9

Q.379. If x² + y² = 41 and xy = 20, then find the value of $\frac{1}{x} + \frac{1}{y}$
RRB NTPC 03/03/2021 (Morning)
(a) $\frac{9}{20}$ (b) $\frac{20}{41}$ (c) $\frac{3}{20}$ (d) $\frac{41}{20}$

Q.380. If (x + 1) and (x + 2) are factors of ax³ + 3x² + bx then the value of a and b are___.
RRB NTPC 03/03/2021 (Evening)
(a) a = 2 and b = 3 (b) a = 1 and b = 2
(c) a = 3 and b = 2 (d) a = 2 and b = 1

Q.381. IF a - b = 4 and a² + b² = 10 then the value of a³ - b³ is:
RRB NTPC 03/03/2021 (Evening)
(a) 100 (b) 64 (c) -8 (d) 28

Q.382. If 2a = 3b = 4c and a + b + c = 13 $\sqrt{2}$, then $a^2 + b^2 + c^2$ is:
RRB NTPC 04/03/2021 (Morning)
(a) 68 (b) 72 (c) 104 (d) 122

Q.383. If $x^4 + \frac{1}{x^4} = 322$ and x>1, then what is the value of x - $\frac{1}{x}$?
RRB NTPC 04/03/2021 (Morning)
(a) 6 (b) 5 (c) 4 (d) 3

Q.384. For x > 0 find the value of
$(1 + \frac{1}{x+1})(1 + \frac{1}{x+2})(1 + \frac{1}{x+3})$
$(1 + \frac{1}{x+4})$
RRB NTPC 04/03/2021 (Evening)
(a) $\frac{x+1}{x+5}$ (b) $(1 + \frac{1}{x+5})$
(c) $\frac{1}{x+5}$ (d) $\frac{x+5}{x+1}$

Q.385. If (a + b + c) = 6, $a^2 + b^2 + c^2$ = 2, then ab + bc + ca= ?
RRB NTPC 04/03/2021 (Evening)
(a) 36 (b) 34 (c) 17 (d) 4

Q.386. If $(\sqrt{2}+1)^3 = a + b\sqrt{2}$, then the correct relation between a and b is
RRB NTPC 05/03/2021 (Morning)
(a) a - b = 2 (b) a = b + 1
(c) a + b = 1 (d) $a^2 + b = 0$

Q.387. If $2^x = 4^{y+1}$ *and* $3^y = 3^{x-9}$, *then* the values of x and y , respectively , are:
RRB NTPC 07/03/2021 (Evening)
(a) 16 ,7 (b) -16 ,7 (c) -16 , (d) 16 ,-7

Q.388. If $x^2 + 25y^2 = 10xy$, then x : y = ?
RRB NTPC 08/03/2021 (Evening)
(a) 2 : 3 (b) 1 : 5 (c) 5 : 1 (d) 3 : 5

Q.389. If x + y = 9 and xy = 18, then the value of $x^2 + y^2$ *is*:
RRB NTPC 08/03/2021 (Evening)
(a) 18 (b) 12 (c) 36 (d) 45

Q.390. If x = 2 + $\sqrt{5}$, then the value of $(x - \frac{1}{x})^3$ is:
RRB NTPC 08/03/2021 (Evening)
(a) 8 (b) 64 (c) $2\sqrt{5}$ (d) 125

Q.391. If $4x^2 - 8x + 3 = 0$, then what are possible values of x?
RRB NTPC 12/03/2021 (Morning)
(a) 1.5, 0.5 (b) 2.5, 1.5
(c) 2, 1.5 (d) 0.2, 0.5

Q.392. If $\frac{a^2-1}{a}$ = 5, then $\frac{a^6-1}{a^3}$ = ?
RRB NTPC 12/03/2021 (Morning)
(a) 120 (b) 140 (c) 125 (d) 130

Q.393. If $2^x = 4^{y+1}$ and $3^y = 3^{x-9}$,then the respective values of x and y will be:
RRB NTPC 13/03/2021 (Evening)
(a) (-16,7) (b) (16,-7) (c) (7,16) (d) (16,7)

Q.394. The value of the variable x in the equation 3 (5x + 2) - 4 = 2 (1 - 4x) is:
RRB NTPC 13/03/2021 (Evening)
(a) 10 (b) -1 (c) 2 (d) 0

Q.395. If x - y = 1, then the value of $x^3 - y^3 - 3xy$ will be:
RRB NTPC 14/03/2021 (Morning)
(a) -1 (b) 2 (c) 0 (d) 1

Q.396. The value of
$\frac{1-x^4}{1+x} \div \frac{1+x^2}{x} \times \frac{1}{x(x-1)}$ is:
(If x is not equal to 0, -1, 1)
RRB NTPC 14/03/2021 (Morning)
(a) -1 (b) 1 (c) 0 (d) 2

Q.397. If x = $\frac{\sqrt{3}+1}{\sqrt{3}-1}$ and y = $\frac{\sqrt{3}-1}{\sqrt{3}+1}$, then the value of $x^2 + y^2$ is..
RRB NTPC 14/03/2021 (Evening)
(a) 14 (b) 10 (c) 13 (d) 15

Q.398. Find the value of 3(x + y) if x = $\frac{\sqrt{3}+1}{\sqrt{3}-1}$ and y=$\frac{\sqrt{3}-1}{\sqrt{3}+1}$.
RRB NTPC 15/03/2021 (Morning)
(a) 12 (b) 10 (c) 8 (d) 13

Q.399. If a - 5 = b, then what is the value of $|a - b| + |b - a|$?
RRB NTPC 15/03/2021 (Morning)
(a) 10 (b) 5 (c) -5 (d) 0

Q.400. What would be the highest value of X in the given equation?
5Y6 + 6X7 + 3Z8=1511
RRB NTPC 15/03/2021 (Morning)
(a) 6 (b) 9 (c) 7 (d) 5

Q.401. If x = 25 and y = 13 then find $\sqrt{x^2 - 2xy + y^2}$
RRB NTPC 15/03/2021 (Morning)
(a) 12 (b) 38 (c) 13 (d) 10

Q.402. If $a^{2x} = b$, $b^{2y} = c$, $c^{2z} = a$ *then* the value of xyz is:
RRB NTPC 15/03/2021 (Evening)
(a) 1 (b) 8 (c) 0 (d) $\frac{1}{8}$

Q.403. What is the value of 99^3?
RRB NTPC 19/03/2021 (Morning)
(a) 970499 (b) 970389
(c) 970289 (d) 970299

Q.404. If 2x + 3y = 23 and x = 4, then what is the value of y?
RRB NTPC 19/03/2021 (Morning)
(a) 6 (b) 4 (c) 5 (d) 3

Q.405. Find the value of $\frac{(p-q)^3 + (q-r)^3 + (r-p)^3}{9(p-q)(q-r)(r-p)}$.
RRB NTPC 19/03/2021 (Evening)
(a) $\frac{2}{3}$ (b) $\frac{1}{5}$ (c) $\frac{1}{4}$ (d) $\frac{1}{3}$

Q.406. If $a^4 + b^4 = 17$ and $a + b = 1$, then the value of $a^2b^2 - 2ab$ is:
RRB NTPC 19/03/2021 (Evening)
(a) 4 (b) 2 (c) 8 (d) 6

Q.407. Find the value of (?) in the following:
$(a^2 - b^2) : (a^2 - ab) :: (a^3 + b^3) :$?
RRB NTPC 19/03/2021 (Evening)
(a) $a(a^2 + 2b^2 - ab)$
(b) $a(a^2 + b^2 - 2ab)$
(c) $a(a^2 + b^2 - ab)$
(d) $a^2(a + b - 2ab)$

Q.408. Find the value of $(x + y)^2$, if $x = \frac{\sqrt{2}+\sqrt{3}}{\sqrt{2}-\sqrt{3}}$ and y = $\frac{\sqrt{2}-\sqrt{3}}{\sqrt{2}+\sqrt{3}}$.
RRB NTPC 19/03/2021 (Evening)
(a) 36 (b) 100 (c) 25 (d) 225

Q.409. Find the remainder when $x^3 + 4x^2 + 6x - 2$ is divided by $(x + 5)$.
RRB NTPC 21/03/2021 (Morning)
(a) - 53 (b) - 50 (c) - 57 (d) - 55

Q.410. If $x - \frac{1}{x} = \sqrt{21}$,find the positive value of $(x^2 + \frac{1}{x^2})(x + \frac{1}{x})$
RRB NTPC 21/03/2021 (Morning)
(a) 125 (b) 115 (c) 122 (d) 120

Q.411. If $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}$ = a + b$\sqrt{15}$, then what is the value of a ?
RRB NTPC 21/03/2021 (Morning)
(a) 5 (b) 3 (c) 4 (d) 8

Q.412. When x + y + z = 16 and xy + yz + zx = 78, find the value of $x^3 + y^3 + z^3 - 3xyz$.
RRB NTPC 21/03/2021 (Evening)
(a) 352 (b) 365 (c) 350 (d) 360

Q.413. If x + y = 1 , then find the value of $x^3 + y^3 + 3xy$.
RRB NTPC 21/03/2021 (Evening)
(a) 6 (b) 0 (c) 1 (d) 2

Q.414. What is the value of the following ?
$(a + 1)(1 - a)(1 - a + a^2)(1 + a + a^2)(1 + a^6)$
RRB NTPC 27/03/2021 (Morning)
(a) $1 + a^{36}$ (b) $1 - a^{36}$
(c) $1 + a^{12}$ (d) $1 - a^{12}$

Q.415. If x = a(b - c), y = b(c - a) and z = c(a - b) then what will be the value of $(\frac{x}{a})^3 + (\frac{y}{b})^3 + (\frac{z}{c})^3$?
RRB NTPC 27/03/2021 (Morning)
(a) 3xyzabc (b) 3 (c) $\frac{xyz}{abc}$ (d) $\frac{3xyz}{abc}$

Q.416. If $x^2 = y + z$, $y^2 = z + x$, $z^2 = x + y$, then the value of $\frac{1}{x+1} + \frac{1}{y+1} + \frac{1}{z+1}$ *will be*:
RRB NTPC 27/03/2021 (Morning)
(a) 1 (b) 2 (c) -1 (d) 4

Q.417. If $\alpha + \beta + \gamma = 0$,

then $\frac{\alpha^2}{\beta\gamma} + \frac{\beta^2}{\gamma\alpha} + \frac{\gamma^2}{\alpha\beta}$ =?

RRB NTPC 27/03/2021 (Evening)

(a) 1 (b) 3 (c) 4 (d) 2

Q.418. If x = 2 + $\sqrt{2}$, then what will be the value of $x^2 - 4x + 4$?

RRB NTPC 27/03/2021 (Evening)

(a) 4 (b) 1 (c) 2 (d) 0

Q.419. For a = - 5 and b = 5, value of $a^2 - b^2$ is:

RRB NTPC 01/04/2021 (Morning)

(a) - 10 (b) 0 (c) - 50 (d) 100

Q.420. What is the value of

$8x^3 + 18xy + y^3 - 27$ when 2x+y -3 = 0.

RRB NTPC 01/04/2021 (Morning)

(a) -27 (b) 27 (c) 0 (d) 1

Q.421. If $\frac{7+2\sqrt{5}}{11+3\sqrt{5}} = a + b\sqrt{5}$, then:

RRB NTPC 03/04/2021 (Morning)

(a) a = 1 ; b = $\sqrt{5}$

(b) a = $\sqrt{5}$; b = 1

(c) a = $\frac{1}{16}$; $b = \frac{47}{76}$

(d) a = $\frac{47}{76}$; b = $\frac{1}{76}$

Q.422. The positive value of m for which the roots of the equation $12x^2 + mx + 6 = 0$ are in the ratio of 2:3 is _____.

RRB NTPC 03/04/2021 (Morning)

(a) $6\sqrt{3}$ (b) $10\sqrt{3}$ (c) $5\sqrt{3}$ (d) $30\sqrt{3}$

Q.423. If x = 3 + $\sqrt{5}$ and y = 3 - $\sqrt{5}$, then find the value of $x^2 + y^2$.

RRB NTPC 03/04/2021 (Morning)

(a) 5 (b) 14 (c) 28 (d) 4

Q.424. If $(\frac{3}{5})^{2x-1} \times (\frac{3}{5})^{4} = (\frac{3}{5})^{15}$

find the value of x.

RRB NTPC 03/04/2021 (Evening)

(a) 12 (b) 5 (c) 6 (d) 0

Q.425. If $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}$ = a + b$\sqrt{15}$ then what is the value of a?

RRB NTPC 03/04/2021 (Evening)

(a) 5 (b) 8 (c) 4 (d) 3

Q.426. If x + $\frac{1}{y}$ = 1 and y + $\frac{1}{z}$ = 1 then find the value of z + $\frac{1}{x}$

RRB NTPC 03/04/2021 (Evening)

(a) -1 (b) 1 (c) 2 (d) 0

Q.427. If a + b + c = 0 then what is the value of $\frac{a^2 + b^2 + c^2}{a^2 - bc}$

RRB NTPC 03/04/2021 (Evening)

(a) 2 (b) 3 (c) 0 (d) 1

Q.428. Find the value of

$\frac{1+\sqrt{3}}{1-\sqrt{3}} + \frac{1-\sqrt{3}}{1+\sqrt{3}}$.

RRB NTPC 05/04/2021 (Morning)

(a) -4 (b) $-2\sqrt{3}$ (c) $2\sqrt{3}$ (d) 4

Q.429. Find the value of n in the given equation.

$27^{1.5} \times 9^{1.25} \div 3^5 = 3^n$

RRB NTPC 05/04/2021 (Morning)

(a) 6 (b) 4 (c) 9 (d) 2

Q.430. Which of the following real numbers has the maximum value? $\sqrt{2}, \sqrt[3]{3}, \sqrt[4]{4}$ and $\sqrt[6]{5}$

RRB NTPC 05/04/2021 (Morning)

(a) $\sqrt[4]{4}$ (b) $\sqrt[3]{3}$ (c) $\sqrt{2}$ (d) $\sqrt[6]{5}$

Q.431. If $\frac{1}{x} + \frac{2}{3} = \frac{1}{2x} + \frac{3}{4}$, then the value of x is:

RRB NTPC 05/04/2021 (Morning)

(a) 2 (b) 8 (c) 6 (d) 4

Q.432. Find four consecutive numbers such that twice the first, three times the second, four times the third and five times the fourth together make 236.

RRB NTPC 05/04/2021 (Evening)

(a) 15, 16, 17, 18 (b) 19, 20, 21, 22

(c) 17, 18, 19, 20 (d) 18, 19, 20, 21

Q.433. If x + y + z = 5 and xy + yz + zx = 8, then the value of $x^3 + y^3 + z^3 - 3xyz$ is:

RRB NTPC 05/04/2021 (Evening)

(a) 11 (b) 7 (c) 5 (d) 9

Q.434. If $\frac{\sqrt{7}-1}{\sqrt{7}+1} - \frac{\sqrt{7}+1}{\sqrt{7}-1}$ = a + b $\sqrt{7}$, then the values of a and b are:

RRB NTPC 06/04/2021 (Morning)

(a) a = 0 and b = $\frac{(-2)}{3}$

(b) a = 0 and b = 0

(c) a = $-\frac{3}{2}$ and b = $\sqrt{7}$

(d) a = $\sqrt{7}$ and b = $\frac{-2\sqrt{7}}{3}$

Q.435. If the sum of the squares of roots of the polynomial $x^2 + 8x + 15k$ is 34, then what will be the value of k?

RRB NTPC 06/04/2021 (Evening)

(a) 3 (b) 2 (c) -1 (d) 1

Q.436. If a + b + c = 5 and $a^2 + b^2 + c^2 = 29$, *then* the value of ab + bc + ca = ?

RRB NTPC 23/07/2021 (Evening)

(a) -2 (b) 2 (c) -1 (d) 1

Q.437. If a + b = ab then a : b = ?

RRB NTPC 24/07/2021 (Morning)

(a) 1 : b -1 (b) b - 1 : 1 (c) 1 : b (d) b : 1

Q.438. If 2a + $\frac{1}{2a}$ = 6, what will be the value of $64a^6 + \frac{1}{64a^6}$?

RRB NTPC 24/07/2021 (Evening)

(a) 46656 (b) 39202 (c) 42592 (d) 36752

Q.439. Solve the following.

Subtract $\frac{9}{2} + \frac{x}{2} + \frac{3}{5}x^2 + \frac{7}{4}x^3$ from $\frac{7}{2} - \frac{x}{3} - \frac{1}{5}x^2$.

RRB NTPC 26/07/2021 (Morning)

(a) 1 - $\frac{5}{6}x + \frac{4}{5}x^2 + \frac{7}{4}x^3$

(b) -1 - $\frac{5}{6}x - \frac{4}{5}x^2 - \frac{7}{4}x^3$

(c) 1 - $\frac{5}{6}x - \frac{4}{5}x^2 + \frac{7}{4}x^3$

(d) 1 - $\frac{5}{6}x + \frac{4}{5}x^2 - \frac{7}{4}x^3$

Q.440. If $\frac{x}{a} + \frac{Y}{b} + \frac{z}{c} = \sqrt{3}$ and $\frac{a}{x} + \frac{b}{y} + \frac{c}{z} = 0$, the find the value of $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2}$

RRB NTPC 26/07/2021 (Evening)

(a) 3 (b) 0 (c) 6 (d) $\sqrt{3}$

Q.441. The system of equations

2x + ky = 11, 5x - 7y = 5 has no solution when k = _____.

RRB NTPC 31/07/2021 (Evening)

(a) $\frac{-13}{5}$ (b) $\frac{-14}{5}$ (c) $\frac{-16}{5}$ (d) $\frac{13}{5}$

RRB JE
(22/05/2019 to 28/06/2019)

Q.442. If x^2 - 4x + 4b = 0 has two real solutions, find the value of 'b'.

RRB JE 22/05/2019 (Afternoon)

(a) b = +1, -1 (b) b = 0

(c) b ≥ 1 (d) b < 1

Q.443. If x = 3 - $\sqrt{2}$, then find the value of $3x^2$ + 2x - 4
RRB JE 22/05/2019 (Afternoon)
(a) 35 - $2\sqrt{2}$ (b) 20 - $\sqrt{2}$
(c) 35 - $20\sqrt{2}$ (d) 35 + $\sqrt{2}$

Q.444. If $\frac{a}{b} + \frac{b}{a}$ = 1, then find $a^3 + b^3$
RRB JE 23/05/2019 (Afternoon)
(a) -1 (b) 2 (c) 0 (d) 1

Q.445. If $\frac{x}{x^2-1} = \frac{A}{x-1} + \frac{B}{x+1}$ then find A and B.
RRB JE 23/05/2019 (Evening)
(a) 2, 2 (b) 2, -2 (c) $\frac{1}{2}, -\frac{1}{2}$ (d) $\frac{1}{2}, \frac{1}{2}$

Q.446. $x^3 + 5x^2$ - 2x - 24 has a zero at x = 2 , find the other Zeros.
RRB JE 24/05/2019 (Evening)
(a) -3, 5 (b) 3, 4 (c) -2,- 3 (d) - 3, - 4

Q.447. If y = 3 + $2\sqrt{2}$,then find the value of $\sqrt{y}$
RRB JE 26/05/2019 (Morning)
(a) $\sqrt{2}$ + 1 (b) $\sqrt{2} + \sqrt{3}$ (c) $\sqrt{2}$ - 1 (d) 1

Q.448. If $x^3 + y^3$ = 9 and x + y = 3 then find the value of $x^2 + y^2$
RRB JE 26/05/2019 (Afternoon)
(a) 25 (b) 5 (c) 3 (d) 6

Q.449. If 3x - y = 5, find the value of $\frac{8^x}{2^y}$
RRB JE 27/05/2019 (Afternoon)
(a) 64 (b) 32 (c) 16 (d) 256

Q.450. If (10.24 × 10.24) - (10.24 × A) + (0.24 × 0.24) is a perfect square, then find the value of 'A'.
RRB JE 28/05/2019 (Morning)
(a) 0.12 (b) 0.24 (c) 0.36 (d) 0.48

Q.451. If a and b are the roots of the equation $3x^2$ - 5x + 2 = 0, then find the value of $(\frac{a}{b}) + (\frac{b}{a})$.
RRB JE 28/05/2019 (Afternoon)
(a) $\frac{13}{6}$ (b) $\frac{13}{2}$ (c) $\frac{13}{9}$ (d) $\frac{9}{13}$

Q.452. If $\sqrt{7}$ = 2.6457 and $\sqrt{3}$ = 1.732, then find the value of $\frac{1}{\sqrt{7}-\sqrt{3}}$.
RRB JE 29/05/2019 (Morning)
(a) 1.0944 (b) 1.944 (c) 1.009 (d) 1.0844

Q.453. If $3\sqrt{5} + \sqrt{125}$ = 17.88, then find the value of $\sqrt{80} + 6\sqrt{5}$
RRB JE 31/05/2019 (Morning)
(a) 22.25 (b) 22.35 (c) 18.75 (d) 20.235

Q.454. If a + b + c = 0 then find the value of $\frac{(b+c)^2}{bc} + \frac{(c+a)^2}{ca} + \frac{(a+b)^2}{ab}$
RRB JE 31/05/2019 (Evening)
(a) $a^2 + b^2 + c^2$ (b) $2(a + b + c)^2$
(c) 8abc (d) 3

Q.455. Given $2x^2$ + 19x + 45 = 0 and $2y^2$ + 11y + 12 = 0, then which of the following regarding the roots x , y is TRUE ?
RRB JE 31/05/2019 (Evening)
(a) x ≥ y (b) x < y (c) x ≤ y (d) x > y

Q.456. If 2x + y = 35 and 3x + 4y = 65, find the value of $\frac{x}{y}$.
RRB JE 01/06/2019 (Morning)
(a) 3 (b) 9 (c) 5 (d) 7

Q.457. The variance of a set of value x_1, x_2, ... x_n is given by which of the following formula ?
RRB JE 01/06/2019 (Afternoon)
(a) $\frac{\Sigma x^2}{n} - (\frac{\Sigma x}{n})^2$ (b) $(\frac{\Sigma x}{n})^2 - \frac{\Sigma x^2}{n}$
(c) $(\frac{\Sigma x}{n})^2$ (d) $\frac{\Sigma x^2}{n} - \frac{\Sigma x}{n}$

Q.458. If x = $\frac{\sqrt{3}+1}{\sqrt{3}-1}$; y = $\frac{\sqrt{3}-1}{\sqrt{3}+1}$, then find $x^2 + y^2$
RRB JE 01/06/2019 (Evening)
(a) 14 (b) 3 (c) 13 (d) 0

Q.459. Find the square root of $\frac{a^2}{b^2} + \frac{b^2}{a^2}$ + 2
RRB JE 02/06/2019 (Afternoon)
(a) $\frac{a}{2b} - \frac{b}{2a}$ (b) $\frac{a}{b} - \frac{b}{a}$
(c) $\frac{a-b}{2}$ (d) $\frac{a}{b} + \frac{b}{a}$

Q.460. Find the equation whose roots are (a + $\sqrt{b}$) and (a - $\sqrt{b}$)
RRB JE 02/06/2019 (Evening)
(a) x^2 + ax + a^2 - b^2 = 0
(b) x^2 - ax + a^2 - b^2 = 0
(c) x^2 - 2ax + (a^2 - b) = 0
(d) x^2 + 2ax - (a^2 - b) = 0

Q.461. The expression, $a^3 + b^3$ + 3ab(a + b) is equivalent to:
RRB JE 27/06/2019 (Evening)
(a) $(a - b)^3$ (b) $(a + b)^3$
(c) $(a - 3b)^3$ (d) $(b - a)^3$

Q.462. If $\frac{p}{b-c} = \frac{q}{c-a} = \frac{r}{a-b}$, then find p + q + r.
RRB JE 28/06/2019 (Evening)
(a) 1 (b) - 1 (c) 0 (d) 2

RRB ALP Tier - 2
(21/01/2019 to 08/02/2019)

Q.463. Which of the following is a quadratic expression?
ALP Tier II 21/01/2019 (Afternoon)
(a) $x^2 + y^3 - 3$ (b) $x^{1/2} - x^2 + 2$
(c) $x^2 + 3x^3 + 5$ (d) $-3x^2 + 4x - 7$

Q.464. Which of the following is not a polynomial ?
ALP Tier II 21/01/2019 (Afternoon)
(a) b + 4/y (b) $4a^2 + 2a - 1$
(c) $3^3 - 1$ (d) $x^2 + 5x + 1$

Q.465. The roots of the quadratic equation x^2 + 8x + 12 = 0 are :
ALP Tier II 21/01/2019 (Afternoon)
(a) - 6, 2 (b) 6, - 2 (c) 2, 6 (d) - 2, - 6

RRB ALP Tier - 1
(09/08/2018 to 31/08/2018)

Q.466. If a + b + c = 0, then $(a^3 + b^3 + c^3)^2$ =?
RRB ALP 09/08/2018 (Afternoon)
(a) $3a^2b^2c^2$ (b) 9abc
(c) 27abc (d) $9a^2b^2c^2$

Q.467. The number of solutions of the pair of linear equations x + 2y - 8 = 0 and 2x + 4y = 16 is
RRB ALP 10/08/2018 (Afternoon)
(a) 0 (b) 2 (c) infinitely many (d) 1

Q.468. If $3x^2$ - ax + 6 = ax^2 + 2x + 2 has only one (repeated) solution, then the positive integral solution of a is:
RRB ALP 13/08/2018 (Afternoon)
(a) 2 (b) 4 (c) 5 (d) 3

Q.469. If the zeroes of the polynomial x^2 - ax + b are 3 and 4, then 'a' and 'b' are respectively equal to
RRB ALP 13/08/2018 (Afternoon)
(a) 7, 12 (b) 4, 3 (c) 3, 4 (d) 12, 7

Q.470. One of the roots of the equation X^2- 4X + K = 0 is X = 3. The other root is :
RRB ALP 14/08/2018 (Morning)
(a) x = −1 (b) x = 1
(c) x = 4 (d) x = -4

Q.471. If one of the zeros of the quadratic polynomial (k - 1) x^2 + kx + 1 is -3 then the value of k=
RRB ALP 14/08/2018 (Evening)
(a) $\frac{-2}{3}$ (b) $\frac{2}{3}$ (c) $\frac{4}{3}$ (d) $\frac{-4}{3}$

Q.472. If x^2 + kx + k = 0 has no solution, then the value of k will satisfy:

RRB ALP 17/08/2018 (Morning)
(a) 0 < k < 4 (b) k < 4
(c) k > 4 (d) k > - 4

Q.473. If $X^2 + kx + k = 0$ has two distinct real solutions, then the value of k will satisfy**:**
RRB ALP 20/08/2018 (Morning)
(a) k < 0 only (b) 0 < k < 4
(c) k > 4 only (d) k < 0 or k > 4

Q.474. If $x^2 + ax + b$ when divided by x - 4 leaves a remainder of 32 and $x^2 + bx + a$ when divided by x - 4 leaves a remainder of 35, then a + b =?
RRB ALP 20/08/2018 (Afternoon)
(a) -23 (b) 7 (c) 23 (d) -7

Q.475. If $x^2 + kx + k = 0$ has repeated roots, then the value of k will satisfy:
RRB ALP 21/08/2018 (Morning)
(a) k = 4 or k = 0 (b) 0 < k < 4
(c) k = 4 only (d) k < 0 or k > 4

Q.476. One of the roots of the equation $x^2-6x + k = 0$ is x= 2. The other root is:
RRB ALP 21/08/2018 (Morning)
(a) X = 4 (b) X = - 4 (c) X = 1 (d) X = -1

Q.477. If the equations 6x - 5y + 11= 0 and 15x + ky - 9 = 0 have no solution, then the value of k is :
RRB ALP 21/08/2018 (Evening)
(a) −12.5 (b) 18 (c) −18 (d) 12.5

Q.478. If α & β are the zeros of the polynomial $5x^2 - 7x + 2$ then the sum of their reciprocals is:
RRB ALP 29/08/2018 (Morning)
(a) $\frac{7}{5}$ (b) $\frac{2}{5}$ (c) $\frac{7}{2}$ (d) $\frac{5}{2}$

Q.479. The value of k, for which the quadratic equation $4x^2 + 4\sqrt{3}x + k = 0$ has equal roots is:
RRB ALP 30/08/2018 (Morning)
(a) -2 (b) 3 (c) 2 (d) -3

Q.480. If $3x^2 + kx + k = 0$ has no solution, then the value of k will satisfy:
RRB ALP 31/08/2018 (Afternoon)
(a) 0 < k < 12 (b) k > 12
(c) k > - 12 (d) k < 12

Q.481. If $12x^2 - ax + 7 = ax^2 + 9x + 3$ has only one (repeated) solution, then the positive integral solution of a is:
RRB ALP 31/08/2018 (Evening)
(a) 4 (b) 2 (c) 5 (d) 3

Answer Key :-

1.(a)	2.(b)	3.(a)	4.(c)
5.(b)	6.(d)	7.(b)	8.(c)
9.(d)	10.(d)	11.(c)	12.(b)
13.(d)	14.(d)	15.(c)	16.(d)
17.(c)	18.(b)	19.(d)	20.(b)
21.(c)	22.(b)	23.(c)	24.(c)
25.(*)	26.(d)	27.(c)	28.(c)
29.(a)	30.(d)	31.(c)	32.(b)
33.(b)	34.(a)	35.(c)	36.(b)
37.(a)	38.(a)	39.(c)	40.(c)
41.(b)	42.(b)	43.(d)	44.(d)
45.(c)	46.(c)	47.(b)	48.(a)
49.(c)	50.(d)	51.(c)	52.(c)
53.(c)	54. (b)	55.(a)	56.(c)
57.(c)	58.(c)	59.(c)	60.(d)
61.(c)	62.(d)	63.(b)	64.(b)
65.(d)	66.(d)	67.(b)	68.(d)
69.(c)	70.(a)	71.(a)	72.(d)
73.(a)	74.(b)	75.(c)	76.(d)
77.(b)	78.(d)	79.(b)	80.(a)
81.(b)	82.(a)	83.(b)	84.(a)
85.(a)	86.(c)	87.(a)	88.(b)
89.(d)	90.(b)	91.(c)	92.(b)
93.(d)	94.(b)	95.(a)	96.(b)
97.(b)	98.(c)	99.(a)	100.(c)
101.(c)	102.(c)	103.(d)	104.(a)
105.(c)	106.(c)	107.(a)	108.(d)
109.(a)	110.(c)	111.(d)	112.(b)
113.(c)	114.(d)	115.(d)	116.(d)
117.(a)	118.(a)	119.(a)	120.(d)
121.(b)	122.(a)	123.(d)	124.(b)
125.(b)	126.(a)	127.(c)	128.(d)
129.(a)	130.(a)	131.(d)	132.(a)
133.(b)	134.(a)	135.(d)	136.(c)
137.(d)	138.(c)	139.(a)	140.(d)
141.(b)	142.(c)	143.(a)	144.(b)
145.(d)	146.(d)	147.(a)	148.(b)
149.(d)	150.(a)	151.(c)	152.(b)
153.(d)	154.(c)	155.(d)	156.(b)
157.(b)	158.(d)	159.(a)	160.(b)
161.(b)	162.(a)	163.(d)	164.(a)
165.(c)	166.(d)	167.(b)	168.(d)
169.(c)	170.(d)	171.(c)	172.(a)
173.(a)	174.(b)	175.(a)	176.(a)
177.(c)	178.(b)	179.(a)	180.(b)
181.(b)	182.(d)	183.(a)	184.(b)
185.(a)	186.(d)	187.(c)	188.(c)
189.(a)	190.(b)	191.(b)	192.(a)
193.(d)	194.(a)	195.(c)	196.(d)
197.(c)	198.(c)	199.(b)	200.(a)
201.(c)	202.(d)	203.(a)	204.(a)
205.(a)	206.(a)	207.(c)	208.(c)
209.(d)	210.(a)	211.(c)	212.(c)
213.(d)	214.(d)	215.(c)	216.(b)
217.(d)	218.(b)	219.(a)	220.(c)
221.(d)	222.(c)	223.(a)	224.(a)
225.(b)	226.(d)	227.(a)	228.(d)
229.(a)	230.(a)	231.(b)	232.(c)
233.(a)	234.(a)	235.(b)	236.(d)
237.(c)	238.(d)	239.(a)	240.(c)
241.(a)	242.(d)	243.(a)	244.(a)
245.(a)	246.(d)	247.(d)	248.(c)
249.(c)	250.(a)	251.(a)	252.(d)
253.(c)	254.(b)	255.(b)	256.(b)
257.(d)	258.(a)	259.(b)	260.(a)
261.(a)	262.(b)	263.(c)	264.(c)
265.(a)	266.(c)	267.(b)	268.(b)
269.(d)	270.(d)	271.(d)	272.(a)
273.(d)	274.(d)	275.(a)	276.(b)
277.(b)	278.(a)	279.(b)	280.(d)
281.(b)	282.(b)	283.(b)	284.(b)
285.(a)	286.(a)	287.(a)	288.(b)
289.(b)	290.(c)	291.(c)	292.(d)
293.(d)	294.(c)	295.(a)	296.(d)
297.(a)	298.(d)	299.(b)	300.(b)
301.(a)	302.(d)	303.(d)	304.(a)
305.(b)	306.(d)	307.(a)	308.(d)
309.(a)	310.(c)	311.(b)	312.(b)
313.(d)	314.(c)	315.(d)	316.(d)
317.(d)	318.(c)	319.(d)	320.(b)
321.(b)	322.(d)	323.(a)	324.(b)
325.(d)	326.(b)	327.(b)	328.(d)
329.(b)	330.(d)	331.(b)	332.(b)
333.(d)	334.(b)	335.(d)	336.(a)
337.(b)	338.(b)	339.(a)	340.(c)
341.(c)	342.(a)	343.(a)	344.(a)
345.(a)	346.(d)	347.(b)	348.(c)
349.(a)	350.(a)	351.(b)	352.(b)
353.(b)	354.(d)	355.(d)	356.(a)
357.(c)	358.(c)	359.(a)	360.(a)
361.(a)	362.(b)	363.(d)	364.(b)
365.(c)	366.(b)	367.(d)	368.(d)
369.(b)	370.(c)	371.(a)	372.(c)
373.(a)	374.(b)	375.(a)	376.(c)

377.(b)	378.(a)	379.(a)	380.(b)
381.(d)	382.(d)	383.(c)	384.(d)
385.(c)	386.(a)	387.(a)	388.(c)
389.(d)	390.(b)	391.(a)	392.(b)
393.(d)	394.(d)	395.(d)	396.(a)
397.(a)	398.(a)	399.(a)	400.(b)
401.(a)	402.(d)	403.(d)	404.(c)
405.(d)	406.(c)	407.(c)	408.(b)
409.(c)	410.(b)	411.(c)	412.(a)
413.(c)	414.(d)	415.(d)	416.(a)
417.(b)	418.(c)	419.(b)	420.(c)
421.(d)	422.(b)	423.(c)	424.(c)
425.(c)	426.(b)	427.(a)	428.(a)
429.(d)	430.(b)	431.(c)	432.(a)
433.(c)	434.(a)	435.(d)	436.(a)
437.(a)	438.(b)	439.(b)	440.(a)
441.(b)	442.(d)	443.(c)	444.(c)
445.(d)	446.(d)	447.(a)	448.(b)
449.(b)	450.(d)	451.(a)	452.(a)
453.(b)	454.(d)	455.(b)	456.(a)
457.(a)	458.(a)	459.(d)	460.(c)
461.(b)	462.(c)	463.(d)	464.(a)
465.(d)	466.(d)	467.(c)	468.(a)
469.(a)	470.(b)	471.(c)	472.(a)
473.(d)	474.(b)	475.(a)	476.(a)
477.(a)	478.(c)	479.(b)	480.(a)
481.(d)			

Solutions:-

Sol.1.(a) In a quadratic equation $ax^2 + bx + c = 0$ if roots are equal
Then discriminant = 0
$b^2 - 4ac = 0 \Rightarrow b^2 = 4ac$
Here in equation $ax^2 + x + b = 0$
$1^2 = 4 \times a \times b \Rightarrow ab = \frac{1}{4}$

Sol.2.(b) $(x - 4x^2 + 5) + \sqrt{3}x + 8 = 0$
Quadratic equation is an equation in which the highest degree is 2. This is only in equation B.

Sol.3.(a) $3x^2 + 6x - 5 = 0$
$\Rightarrow D = b^2 - 4ac = 36 + 60 = 96 > 0$
Here, D > 0 , so the roots are real and distinct.

Sol.4.(c) $3x^2 - 13x + 6 = 0$
Product of the roots = $\frac{c}{a} = \frac{6}{3} = 2$

Sol.5.(b) On putting x = 3,
$x^2 - 12x + k = 0$
$\Rightarrow 9 - 36 + k = 0 \Rightarrow k = 27$
Now, $x^2 - 12x + 27 = 0$
$(x - 9)(x - 3) = 0 \Rightarrow x = 9, 3$

Sol.6.(d) $x^2 - 7x + 12 = 0$
$\Rightarrow x^2 - 3x - 4x + 12 = 0$
$\Rightarrow (x - 3)(x - 4) = 0 \Rightarrow x = 3 \text{ and } 4$
a = 3 and b= 4
$\frac{a^3 + b^3}{a^2 + b^2 + 1} = \frac{27 + 64}{9 + 16 + 1}$
$= \frac{91}{26} = \frac{7}{2} = 3.5$

Sol.7.(b) $x - \frac{1}{x} = 8$
Now ,
$x^3 - \frac{1}{x^3} = (x - \frac{1}{x})^3 + 3(x - \frac{1}{x})$
$x^3 - \frac{1}{x^3} = 512 + 24 = 536$

Sol.8.(c) $x + \frac{1}{x} = 42$, then $x^3 + \frac{1}{x^3}$
$= 42^3 - 3 \times 42 = 74088 - 126$
$= 73,962$

Sol.9.(d) As per the question,
sum of roots $(\alpha + \beta) = 12 + 7 = 19$
And product of roots $(\alpha x \beta) = 12 \times 7 = 84$
A quadratic equation, whose roots are α and β can be written as
$x^2 - (\alpha + \beta)x + (\alpha\beta) = 0$
so, $x^2 - 19x + 84 = 0$
Hence option d is correct

Sol.10.(d)
$(x + \frac{1}{x})^2 = x^2 + \frac{1}{x^2} + 2$
Then, $x^2 + \frac{1}{x^2} = 3^2 - 2 = 7$
$(x + \frac{1}{x})^3 = x^3 + \frac{1}{x^3} + 3x \times \frac{1}{x}(x + \frac{1}{x})$
$x^3 + \frac{1}{x^3} = (x + \frac{1}{x})^3 - 3(x + \frac{1}{x})$
Then $x^6 + \frac{1}{x^6} = 7^3 - 3 \times 7$
$= 343 - 21 = 322$

Sol.11.(c) $x^2 + 2\sqrt{x} - 5 = 0$
Clearly it's not a quadratic equation .

Sol.12.(b) Given , Sum of roots = $\frac{q}{p}$
and product of roots = $\frac{r^2}{q}$
Now ,as we know that for equation,
x^2 - (sum of roots)x + product of roots = 0
$x^2 - \frac{qx}{p} + \frac{r^2}{q} = 0$
$\Rightarrow \frac{pqx^2 - q^2x + pr^2}{pq} = 0$
$\Rightarrow pqx^2 - q^2x + pr^2 = 0$
And now discriminant = $b^2 - 4ac$
$\Rightarrow (-q^2)^2 - 4 \times pq \times pr^2 \Rightarrow q^4 - 4p^2r^2q$
Therefore, option (b) is the right answer.

Sol.13.(d) The quadratic equation $ax^2 + bx + c = 0$, the expression $b^2 - 4ac$ is called the discriminant.
ATQ, comparing the quadratic equation $(bx^2 + cx + a = 0)$, a = b, b = c, c = a
Hence, $\Rightarrow b^2 - 4ac = c^2 - 4ab$

Sol.14.(d) $y^2 - 4y + 4 = 0$
$(y - 2)^2 = 0 \Rightarrow y = 2$
Putting $y = 2$ in 3x + 2y = 13, we get
$3x + 2(2) = 13 \Rightarrow 3x = 9 \Rightarrow x = 3$
So, (x, y) = (3, 2)

Sol.15.(c) a + b = 15
$(a + b)^2 = 225 \Rightarrow a^2 + b^2 + 2ab$
$= 225 \Rightarrow ab = \frac{225 - 113}{2} = 56$
Now, $a^3 + b^3 = (a + b)(a^2 + b^2 - ab)$
$= 15(113 - 56) = 15 \times 57 = 855$

Sol.16.(d) From the two equations
$\frac{X}{2} + \frac{2}{Y} = 1$ and $\frac{y}{2} + \frac{2}{z} = 1$,
The values of x = 1, y = 4 and z = - 2,
Then the value of
$\frac{z}{2} + \frac{2}{x}, = \frac{-2}{2} + \frac{2}{1} = 1$

Sol.17.(c) If $x + \frac{1}{x} = 12 \Rightarrow x^2 + \frac{1}{x^2}$
$= (x + \frac{1}{x})^2 - 2 = 144 - 2 = 142$
Again $x^2 - \frac{1}{x^2} = 50$,
Then $x^4 - \frac{1}{x^4} = (x^2 + \frac{1}{x^2})(x^2 - \frac{1}{x^2})$
$= 142 \times 50 = 7100$

Sol.18.(b)
Degree of polynomial $9x^5y^2z^r$ is 15
So, Sum of all indices = 5 + 2 + r = 15
r = 8

Sol.19.(d) Sum of reciprocals
$= \frac{a + b}{ab} = \frac{25}{35} = \frac{5}{7}$

Sol.20.(b) Given, $x - \frac{1}{x} = 5$
We know that, $x - \frac{1}{x} = k$
then $x^2 + \frac{1}{x^2} = k^2 + 2$
Now , $x - \frac{1}{x} = 5$, $x^2 + \frac{1}{x^2}$
$= 5^2 + 2 = 27$

We know that $x^2 + \frac{1}{x^2}$ = k,

then $x^4 + \frac{1}{x^4} = k^2 - 2$

Hence, $x^4 + \frac{1}{x^4} = 27^2 - 2 = 727$

Sol.21.(c) $x^3 + \frac{1}{x^3} = 18$

Now, $x + \frac{1}{x} = \sqrt[3]{18 + 9} = 3$

Sol.22.(b) $x^4 + \frac{1}{x^4} = 322$

$\Rightarrow x^2 + \frac{1}{x^2} = \sqrt{322 + 2} = \sqrt{324} = 18$

$\Rightarrow x - \frac{1}{x} = \sqrt{18 - 2} = \sqrt{16} = 4$

Now,

$x^3 - \frac{1}{x^3} = 4^3 + 3 \times 4$

$= 64 + 12 = 76$

Sol.23.(c) $2\sqrt{5} + \sqrt{125} = 7x$

$2\sqrt{5} + 5\sqrt{5} = 7x$

$7\sqrt{5} = 7x \Rightarrow X = \sqrt{5}$

Now , $\sqrt{80} + 4\sqrt{5} = 4\sqrt{5} + 4\sqrt{5}$

$= 8\sqrt{5} = 8x$

Sol.24.(c) We Know that , $(x + \frac{1}{x}) = k$,

then $(x - \frac{1}{x}) = \sqrt{K^2 - 4}$

A/Q , $(x + \frac{1}{x}) = 7$, $(x - \frac{1}{x}) = \sqrt{7^2 - 4}$

$= \sqrt{49 - 4} = \sqrt{45} = 3\sqrt{5}$

Sol.25.(*) An equation has infinite number of solutions if,

$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

$\frac{3}{2a} = \frac{-2}{(a-b)} = \frac{8}{48}$

By solving we get,

a = 9, b = 21 $\Rightarrow$ a = $\frac{3}{7b}$

Sol.26.(d)

$(x^2 + \frac{1}{x^2})^2 = x^4 + \frac{1}{x^4} + 2x^2 \times \frac{1}{x^2}$

$x^4 + \frac{1}{x^4} = \sqrt{47 + 2} = 7$

$(x + \frac{1}{x})^2 = x^2 + \frac{1}{x^2} + 2x \times \frac{1}{x}$

$x + \frac{1}{x} = \sqrt{7 + 2} = 3$

Sol.27.(c) When two roots of the quadratic equation are given. Then, it can be written as:

x^2 - x(sum of roots) + product of roots = 0

$x^2 - x(\frac{2}{3} - \frac{1}{2}) - \frac{1}{3} = 0$

$\Rightarrow x^2 - \frac{1}{6}x - \frac{1}{3} = 0 \quad \Rightarrow 6x^2 - x - 2 = 0$

$\Rightarrow 6x^2 - 4x + 3x - 2 = 0$

$\Rightarrow 2x(3x - 2) + 1(3x - 2) = 0$

$\Rightarrow (3x - 2)(2x + 1) = 0$

Sol.28.(c) $(a + \frac{1}{a})^2 = a^2 + \frac{1}{a^2} + 2$

$= 3 + 2 = 5 \Rightarrow a + \frac{1}{a} = \sqrt{5}$

Now, $a^3 + \frac{1}{a^3} = (a + \frac{1}{a})(a^2 + \frac{1}{a^2} - 1)$

$= \sqrt{5}(3 - 1) = 2\sqrt{5}$

Sol.29.(a) $(x + y + z)^2$

$= x^2 + y^2 + z^2 + 2(xy + yz + zx)$

$11^2 = x^2 + y^2 + z^2 + 2 \times 42$

$121 - 84 = x^2 + y^2 + z^2$

$37 = x^2 + y^2 + z^2$

Sol.30.(d) $(3a - 4b - 2c)^2$

$= (3a)^2 + (-4b)^2 + (-2c)^2 + 2(3a)(-4b) + 2(-4b)(-2c) + 2(-2c)(3a)$

$(3a - 4b - 2c)^2 = 9a^2 + 16b^2 + 4c^2 - 24ab + 16bc - 12ac$

Sol.31.(c) $4x^2 + 7x - 21 = 0$

Sum of the roots = $\frac{-b}{a} = \frac{-7}{4}$

Sol.32.(b) $5x^2 + bx + 4 = 0$

Sum of the roots

$\Rightarrow \frac{-b}{a} = \frac{-b}{5} = 9 \Rightarrow b = -45$

Sol.33.(b)

$x^2 + x - 2 = 0 \quad a \text{ and } b \text{ are root.}$

Sum of the roots

$= \frac{-b}{a} \text{ and product of roots } = \frac{c}{a}$

So, a + b = -1 and ab = -2

Now, $\alpha = \frac{1}{a} + \frac{1}{b} = \frac{a + b}{ab} = \frac{-1}{-2} = \frac{1}{2}$

$\text{and } \beta = ab = -2$

$(\alpha + \beta) = \frac{1}{2} + (-2) = \frac{-3}{2}$

$\text{and } \alpha\beta = -1$

Now, new quadratic equation

$= x^2 - (\alpha + \beta)x + \alpha\beta = 0$

; $\alpha \text{ and } \beta \text{ are root.}$

$= x^2 - (\frac{-3}{2})x - 1 = 0$

$\Rightarrow 2x^2 + 3x - 2 = 0$

Sol.34.(a) $3x - 2y = 10 \text{ and } xy = 11$

$(a - b)^3 = a^3 - b^3 - 3ab(a - b)$

$a^3 - b^3 = (a - b)^3 + 3ab(a - b)$

$27x^3 - 8y^3 = 10^3 + 3 \times 3x \times 2y(10)$

$= 1000 + 1980 = 2980$

Sol.35.(c) $\frac{6}{x} - \frac{2}{x-1} - \frac{1}{x-2} = 0$

$\Rightarrow \frac{6(x-1)(x-2) - 2x(x-2) - x(x-1)}{x(x-1)(x-2)} = 0$

$\Rightarrow \frac{6x^2 - 18x + 12 - 2x^2 + 4x - x^2 + x}{x(x-1)(x-2)} = 0$

$\Rightarrow \frac{3x^2 - 13x + 12}{x(x-1)(x-2)} = 0$

$\Rightarrow 3x^2 - 13x + 12 = 0$

$\Rightarrow 3x^2 - 9x - 4x + 12 = 0$

$\Rightarrow (x - 3)(3x - 4) = 0 \Rightarrow x = 3, \frac{4}{3}$

Sol.36.(b)

$x^2 + 2x + 9 = (x - 2)(x - 3)$

$\Rightarrow x^2 + 2x + 9 = x^2 - 5x + 6$

$\Rightarrow 7x = 6 - 9 \Rightarrow 7x = -3$

It is not a quadratic equation.

Sol.37.(a) $(a + b)^2 = (a - b)^2 + 4ab$

$\Rightarrow 56^2 = 496 + 4ab$

$\Rightarrow 4ab = 3136 - 496$

$\Rightarrow 4ab = 2640 \Rightarrow ab = 660$

Sol.38.(a) $6p^2 - 5p - 6 = 0$

$\Rightarrow 6p^2 - 9p + 4p - 6 = 0$

$\Rightarrow 3p(2p - 3) + 2(2p - 3) = 0$

$\Rightarrow (2p - 3)(3p + 2) = 0$

$\Rightarrow p = \frac{3}{2} \text{ and } \frac{-2}{3}$

Sol.39.(c) $d^2 + \frac{1}{d^2} = 18$

$d - \frac{1}{d} = \sqrt{18 - 2} = \sqrt{16} = 4$

$d^3 - \frac{1}{d^3} = (d - \frac{1}{d})^3 + 3(d - \frac{1}{d})$

$= 4^3 + 3 \times 4 = 64 + 12 = 76$

Sol.40.(c) By taking option (c)

$x^2 - 2x - 2 = 0$

Roots = $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$\Rightarrow \frac{2 \pm \sqrt{(-2)^2 - 4 \times 1 \times -2}}{2}$

$\Rightarrow \frac{2 \pm \sqrt{12}}{2} = \frac{2 \pm 2\sqrt{3}}{2}$

Therefore roots = $(1+\sqrt{3})$ and $(1-\sqrt{3})$

Sol.41.(b) $x^2 + 7x + 6 = 0$

$\Rightarrow x^2 + 6x + x + 6 = 0$

$\Rightarrow x(x + 6) + 1(x + 6) = 0$

$\Rightarrow (x + 6)(x + 1) = 0$

Sol.42.(b)

$$\frac{(4x^2 - 9y^2)^3 + (9y^2 - 49z^2)^3 + (49z^2 - 4x^2)^3}{(2x - 3y)^3 + (3y - 7z)^3 + (7z - 2x)^3}$$

As , We know that If a + b + c = 0 then
$a^3 + b^3 + c^3 = 3abc$

$$= \frac{3(4x^2 - 9y^2)\ (9y^2 - 49z^2)\ (49z^2 - 4x^2)}{3(2x - 3y)\ (3y - 7z)\ (7z - 2x)}$$

$$\frac{3(2x-3y)\ (2x+3y)\ (3y-7z)\ (3y+7z)\ (7z-2x)\ (7z+2x)}{3(2x-3y)\ (3y-7z)\ (7z-2x)}$$

= (2x + 3y)(3y + 7z)(7z + 2x)

Sol.43.(d) $x^2 - 6x + 9 = 0$
$\Rightarrow x^2 - 3x - 3x + 9 = 0$
$\Rightarrow x(x - 3) - 3(x - 3) = 0$
$\Rightarrow (x - 3)(x - 3) = 0 \Rightarrow (x - 3)^2 = 0$

Sol.44.(d) $\alpha = \frac{7}{3}$, $\beta = \frac{12}{5}$
Quadratic equation
$= x^2 - (\alpha + \beta)x + \alpha\beta$;
$where\ \alpha\ and\ \beta\ are\ its\ roots.$
$\rightarrow x^2 - (\frac{7}{3} + \frac{12}{5})x + (\frac{7}{3} \times \frac{12}{5}) = 0$
$\rightarrow x^2 - \frac{71x}{15} + \frac{28}{5} = 0$
$\rightarrow 15x^2 - 71x + 84 = 0$

Sol.45.(c) $x^2 + xy + x = 18$ ..... (1)
$y^2 + xy + y = 24$ ..... (2)
Adding eq . (1) and (2);
$x^2 + y^2 + 2xy + (x + y) = 42$
$\Rightarrow (x + y)^2 + (x + y) = 42$
Now, by option (x + y) = 6 or -7

Sol.46.(c) $\sqrt{2x + 9} + x = 13$
Squaring both side, we get
$\Rightarrow (\sqrt{2x + 9})^2 = (13 - x)^2$
$\Rightarrow 2x + 9 = 169 + x^2 - 26x$
$\Rightarrow x^2 - 28x + 160 = 0$
$\Rightarrow x^2 - 20x - 8x + 160 = 0$
$\Rightarrow x(x - 20) - 8(x - 20) = 0$
$\Rightarrow (x - 20)(x - 8) = 0 \Rightarrow x = 20\ or\ 8$

Sol.47.(b) $a^4 + \frac{1}{a^4} = 34\ \ then$
$a^2 + \frac{1}{a^2} = \sqrt{34 + 2} = 6$
$a^6 + \frac{1}{a^6} = 216 - 18 = 198$

Sol.48.(a)
a + b + c = 6 and ab + bc + ca = -2
$\Rightarrow (a + b + c)^2$
$= a^2 + b^2 + c^2 + 2(ab + bc + ca)$
$\Rightarrow a^2 + b^2 + c^2$
$= 6^2 - 2(-2) = 36 + 4 = 40$
$a^3 + b^3 + c^3 - 3abc = (a + b + c)$
$[a^2 + b^2 + c^2 - (ab + bc + ca)]$
= 6 × (40 - (-2) = 6 × 42 = 252

Sol.49.(c) $x^2 + 11x - 26 = 0$
$\Rightarrow x^2 + 13x - 2x - 26 = 0$
$\Rightarrow x(x + 13) - 2(x + 13) = 0$
$\Rightarrow (x + 13)(x - 2) = 0$
$\Rightarrow x = 2\ or\ -13$

Sol.50.(d) Check by options,
$p(p^2 + 7) = p^2 + p^3 - 18$
$\Rightarrow p^3 + 7p = p^3 + p^2 - 18$
$\Rightarrow p^2 - 7p - 18 = 0$
It is a quadratic equation.

Sol.51.(c) $16x^2 - 8x + 1 = 0$
$16x^2 - 4x - 4x + 1 = 0$
$4x(4x - 1) - 1(4x - 1) = 0$
$(4x - 1)(4x - 1) = 0$
$\Rightarrow x = \frac{1}{4}$,
Then, $16x^2 + \frac{1}{4x^2} = 1 + 4 = 5$

Sol.52(c) $3a^2x^2 + 8abx + 4b^2 = 0$
$\Rightarrow 3a^2x^2 + 2abx + 6abx + 4b^2 = 0$
$\Rightarrow ax(3ax + 2b) + 2b(3ax + 2b) = 0$
$\Rightarrow (3ax + 2b)(ax + 2b) = 0$
$\Rightarrow x = \frac{-2b}{a}\ or\ \frac{-2b}{3a}$

Sol.53(c) $\alpha = 1 + \sqrt{3}\ and\ \beta = 1 - \sqrt{3}$
Quadratic equation, $x^2 - (\alpha + \beta)x + \alpha\beta$
$\Rightarrow x^2 - (1 + \sqrt{3} + 1 - \sqrt{3})\ x +$
$(1 + \sqrt{3})(1 - \sqrt{3}) \Rightarrow x^2 - 2x - 2 = 0$

Sol.54.(b) $(3x - 2y)^2(x^2 + y^3)^2$
$\Rightarrow (9x^2 + 4y^2 - 12xy)(x^4 + y^6 + 2x^2y^3)$
$\Rightarrow (9x^6 + 4y^2x^4 - 12x^5y + 9x^2y^6 + 4y^8$
$- 12xy^7 + 18x^4y^3 + 8x^2y^5 - 24x^3y^4)$
Coefficient of $x^4y^3\ is\ 18$.

Sol.55.(a)
Given, (a + 3)x² - 13ax + 7 - a = 0
Comparing this equation with standard equation ax² + bx +c = 0 we get,
a = (a + 3) , b = -13 and c = 7-a
Let one root of equation be ∝
So, other root = $\frac{1}{\propto}$
Now,
we know that Products of roots = $\frac{c}{a}$
So, $\propto \times \frac{1}{\propto} = \frac{c}{a}$
Putting value of c and a we get,
$\propto \times \frac{1}{\propto} = \frac{7 - a}{a + 3}$
$\Rightarrow$ a + 3 = 7 - a $\Rightarrow$ 2a = 4 $\Rightarrow$ a = 2

Sol.56.(c) (z + 4)x² + (z + 1)x + 1 = 0
Here, a = z + 4 , b = z + 1 and c = 1
$b^2 - 4ac = 0$; then roots are equal.
$(z + 1)^2 - 4(z + 4).1 = 0$
$\Rightarrow z^2 + 1 + 2z - 4z - 16 = 0$
$\Rightarrow z^2 - 2z - 15 = 0$
$\Rightarrow z^2 - 5z + 3z - 15 = 0$
$\Rightarrow (z + 3)(z - 5) = 0$
$\Rightarrow z = 5\ or\ -3$

Sol.57.(c)
$a^2 + 9b^2 + c^2 - 6ab + 6bc - 2ac$
$= a^2 + (-3b)^2 + (-c)^2 + 2\times a\times(-3b)$
$+2\times(-3b)\times(-c) + 2\times a\times(-c)$
$= (a - 3b - c)^2$

Sol.58.(c)
First root = α , then other root = 2α
Quadratic equation,
$x^2 - (\alpha + 2\alpha)x + \alpha.2\alpha = 0$
$\Rightarrow x^2 - 3\alpha x + 2\alpha^2 = 0$

Sol.59.(c) $\alpha = -2\ and\ \beta = 4$
Quadratic equation;
$x^2 - (\alpha + \beta)x + \alpha\beta = 0$
$\Rightarrow x^2 - (-2 + 4)x + (-2).4 = 0$
$\Rightarrow x^2 - 2x - 8 = 0 \Rightarrow 3x^2 - 6x - 24 = 0$

Sol.60.(d) $x^2 - x - 12 = 0$
$\Rightarrow x^2 - 4x + 3x - 12 = 0$
$\Rightarrow (x + 3)(x - 4) = 0$
$\Rightarrow x = 4\ or\ -3 \Rightarrow$ a = 4 , b = -3
Now, New roots
$\alpha = (2a - 1) = 7\ and\ \beta = (2b + 1)$
$= -5$
Quadratic equation =
$x^2 - (\alpha + \beta)x + \alpha\beta = 0$
$\Rightarrow x^2 - (7 + (-5))x + 7(-5) = 0$
$\Rightarrow x^2 - 2x - 35 = 0$

Sol.61.(c) If a + b + c = 0 then
$a^3 + b^3 + c^3 = 3abc$
$(a - b)^3 + (b - 2c)^3 + (-a + 2c)^3$
$= 3((a - b)(b - 2c)(-a + 2c))$

Sol.62.(d) $12x^2 = 27x \Rightarrow x = \frac{27}{12}\ or\ \frac{9}{4}$
x = $\frac{9}{4}$, 0 satisfies the equation.

Sol.63.(b) After simplification,
4z² + 25y² - 20yz + 25z² + 4y² +20yz - 25z² = 29y² + 4z²

Sol.64.(b) 2x² + 7x +6 = 0
$\Rightarrow$ 2x² + 4x + 3x + 6 = 0
$\Rightarrow$ 2x(x + 2) + 3(x + 2) = 0
So, (2x + 3)(x + 2) = 0

Sol.65.(d) a² + b² = 50 ,ab = 7 (given)
a² + b² + 2ab = 50 +14
$\Rightarrow$ (a+ b)² = 64 $\Rightarrow$ a + b = 8
Now ,
a² + b² -2ab = 50 - 14
$\Rightarrow$ (a - b)² = 36 $\Rightarrow$ a - b = 6

$\Rightarrow \frac{a-b}{a+b} = \frac{6}{8} \Rightarrow \frac{3}{4}$

Sol.66.(d)

$\frac{1}{2-\sqrt{2}}$ after rationalization = $\frac{2+\sqrt{2}}{2}$

Irrational roots always occur as conjugates.

Conjugate of $\frac{2+\sqrt{2}}{2} = \frac{2-\sqrt{2}}{2}$

Sum of roots = $\frac{2+\sqrt{2}}{2} + \frac{2-\sqrt{2}}{2} = 2$

Product of roots = $\frac{2+\sqrt{2}}{2} \times \frac{2-\sqrt{2}}{2} = \frac{1}{2}$

Quadratic equation :

$x^2 - (\alpha + \beta)x + \alpha\beta = 0$

$\Rightarrow x^2 - 2x + \frac{1}{2} = 0 \Rightarrow 2x^2 - 4x + 1 = 0$

Sol.67.(b) A quadratic equation is a second order equation written as ax² + bx + c = 0 ,where a, b, and c are coefficients of real numbers and a ≠ 0. We can clearly see that x² -2x +3 =0 is a quadratic equation.

Sol.68.(d) $2x^2$ + 4x - 1 = 0

Sum of roots = $\frac{-b}{a} = \frac{-4}{2}$ = - 2

Products of roots = $\frac{c}{a} = \frac{-1}{2}$

Standard form of quadratic equation

= x^2 - (sum of roots)x + (products of roots) = 0

x^2 - $(-2 + \frac{-1}{2})$x + $(-2 \times \frac{-1}{2})$ = 0

x^2 - $(\frac{-5}{2})$x + 1 = 0 ⇒ $2x^2$ + 5 x + 2 = 0

Sol.69.(c) $x^3 - 3x + 6 = 0$

A quadratic equation is a second order equation written as

ax² + bx + c = 0 where a, b, and c are coefficients of real numbers and a ≠ 0.

we can clearly see that x^3 - 3x + 6 = 0 is not a quadratic equation.

Sol.70.(a) x = 2 + $\sqrt{5}$ and y = 2 - $\sqrt{5}$

x + y = 4 and xy = 4 - 5 = -1

Now, $x^2 + y^2$ = 16 - 2 (-1) = 16 + 2 = 18

Sol.71.(a) x^2 - 5x - 14 = 0

$\Rightarrow x^2 - 7x + 2x - 14 = 0$

$\Rightarrow (x-7)(x+2) = 0$

$\Rightarrow x = 7 \text{ or } -2$ a = 7 b = -2

Then, $a^3 b^2 + a^2$

$b^3 = 343 \times 4 + 49 \times (-8)$

$= 1372 - 392 = 980$

Sol.72.(d) 7x² + 28x+1=0

Sum of the roots = $\frac{-b}{a} = \frac{-28}{7} = -4$

Sol.73.(a) a + b = 48 and ab = 56

$a^3 + b^3 = (a+b)^3 - 3ab(a+b)$

$= 48^3 - 3 \times 56 \times 48 = 1,02,528$

Sol.74.(b) (2 - p) x² + 2px - (p + 1)=0

a = (2 - p) , b = - 2p , c = - (p + 1)

If the roots are real , then $b^2 - 4ac = 0$

$4p^2 + 4 \times (2-p)(p+1) = 0$

$\Rightarrow 4p^2 - 4p^2 + 4p + 8 = 0$

$\Rightarrow 4p + 8 = 0 \Rightarrow 4p = -8$

$\Rightarrow p = -2$

Sol.75.(c) $3x^2 + 12x - 15 = 0$

$\Rightarrow x^2 + 4x - 5 = 0$

$\Rightarrow x^2 + 5x - x - 5 = 0$

$\Rightarrow (x+5)(x-1) = 0$

$\Rightarrow x = 1 \text{ or } -5$

Hence, Negative root is -5.

Sol.76.(d) $2x^2 - 7x + 5 = 0$

$\Rightarrow 2x^2 - 5x - 2x + 5 = 0$

$\Rightarrow (2x-5)(x-1) = 0$

$\Rightarrow x = \frac{5}{2} \text{ or } 1$

Difference of roots = $\frac{5}{2} - 1 = \frac{3}{2}$

Sol.77.(b)

Put x = 2 + $\sqrt{5}$ and satisfy the option.

$x^2 - 4x - 1$

$= 4 + 5 + 4\sqrt{5} - 8 - 4\sqrt{5} - 1 = 0$

Sol.78.(d) $\sqrt{3}x^2 + 6x - \sqrt{3} = 0$

$b^2 - 4ac = 36 + 12 = 48 > 0$

So, roots are real and distinct.

Sol.79.(b) $2x^2$ - x - 3 = 0

$\Rightarrow 2x^2 - 3x + 2x - 3 = 0$

$\Rightarrow (2x-3)(x+1) = 0$

$\Rightarrow x = \frac{3}{2} \text{ or } -1$

Sol.80.(a)

a + b = 25 .....(1) and a - b = 13 .....(2)

On solving both the equations, a = 19 and b = 6

$(a+b)^2 = (19+6)^2 = 25^2 = 625$

Sol.81.(b) A quadratic equation is a second order equation written as ax² + bx + c = 0 where a, b, and c are coefficients of real numbers and a ≠ 0.

By option,

$\sqrt{2x^2 + 3x - 4} - 2x + 5 = 0$

is a quadratic equation.

Sol.82.(a) A quadratic equation is a second order equation written as ax² + bx + c = 0 where a, b, and c are coefficients of real numbers and a ≠ 0.

(m +1) - $\frac{1}{m+1} = 65 \Rightarrow m^2 + 1 + 2m - 1$

$= 65m + 65 \Rightarrow m^2 - 63m - 65 = 0$

It is a quadratic equation.

Sol.83.(b) If a quadratic equation has two roots a,b

Then equation, $x^2 - (a+b)x + ab = 0$

Put a = 15 and b = -16

$x^2 - (15-16)x + 15(-16) = 0$

x² + x - 240 = 0

Sol.84.(a) $a = 2 + \sqrt{3}$ *and* $b = 4 - 2\sqrt{3}$

Then quadratic equation ,

$x^2 - (a+b)x + ab = 0$

$\Rightarrow x^2 - (2 + \sqrt{3} + 4 - 2\sqrt{3})x +$

$(2 + \sqrt{3})(4 - 2\sqrt{3}) = 0$

$\Rightarrow x^2 - (6 - \sqrt{3})x + 2 = 0$

Sol.85.(a) $\sqrt{2}$x² - $2\sqrt{5}$x + $\sqrt{3}$ = 0

Sum of the roots

= $\frac{-b}{a} = -\frac{(-2\sqrt{5})}{\sqrt{2}} = \sqrt{10}$

Sol.86.(c) $\alpha = 3$ *and* $\beta = -2$

Quadratic equation

$\Rightarrow x^2 - (\alpha + \beta)x + \alpha\beta = 0$

$\Rightarrow x^2 - (3-2)x + (-6) = 0$

$\Rightarrow x^2 - x - 6 = 0$

Sol.87.(a) (x - 5)² = 5x + 11

$\Rightarrow x^2 + 25 - 10x - 5x - 11 = 0$

$\Rightarrow x^2 - 15x + 14 = 0$

$\Rightarrow x^2 - 14x - x + 14 = 0$

$\Rightarrow (x-14)(x-1) = 0$

$\Rightarrow x = 1 \text{ or } 14$

Sol.88.(b) For the nature of roots ,

D = b² - 4ac ⇒ b² - 4ac

4 (p + q)² - 4×2 (p + q)²

= - 4 (p + q)² ⇒ Here, D<0

Therefore, roots will be imaginary.

Sol.89.(d) By putting x = -1

3 × (- 1)² + p(- 1) + q =0

⇒ q - p = -3 .....(1)

By putting x = -2

3 ×(-2)² + p(-2) + q =0

⇒ q - 2p = -12 .....(2)

Adding equation (2) with (1)

q - p = -3

q - 2p = -12

2q - 3p = -15

By taking common of (-)

3p - 2q =15

Sol.90.(b) $6x^2 + x - 15 = 0$

Sum of the roots $(\alpha + \beta)$ = -(b/a)

= $\frac{-1}{6}$ *and* $\alpha\beta = (c/a) = \frac{-15}{6}$

$\alpha - \beta = \sqrt{(\alpha + \beta)^2 - 4\alpha\beta}$

$=\sqrt{\frac{1}{36} + 10} = \sqrt{\frac{361}{36}} = \frac{19}{6}$

Sol.91.(c) $x^2 - 4x + 4 = 0$

$\Rightarrow x^2 - 2x - 2x + 4 = 0$

$\Rightarrow (x - 2)(x - 2) = 0 \Rightarrow x = 2$

$Now,\ x^3 + x^2 + \frac{1}{x} + \frac{1}{x^2}$

$= 8 + 4 + \frac{1}{2} + \frac{1}{4} = 12.75$

Sol.92.(b) $x^2 - 2x + 1 = 0$

A quadratic equation always has 2 roots.

Sol.93.(d)

Put $x = in\ each\ option\ and\ check.$

Let's choose option (d), Put $x = 4 - 2\sqrt{5}$

$(4 - 2\sqrt{5})^2 - 8(4 - 2\sqrt{5}) - 4 = 0$

$36 - 16\sqrt{5} - 32 + 16\sqrt{5} - 4 = 0$

$36 - 32 - 4 = 0 \Rightarrow 0 = 0.$

Sol.94.(b) $4x^2 + bx + 1 = 0$

Equal roots$\rightarrow b^2 - 4ac = 0$

$b^2 - 4 \times 4 \times 1 = 0$

$b^2 = 16 \Rightarrow b = 4\ or\ -4$

Sol.95.(a) $5x^2 - 3x - 2 = 0$

$\Rightarrow 5x^2 - 5x + 2x - 2 = 0$

$\Rightarrow (5x + 2)(x - 1) = 0$

$\Rightarrow x = 1\ or \frac{-2}{5}$

$\alpha = 1\ and\ \beta = \frac{-2}{5}$

$(\alpha - 2\beta) = 1 + \frac{4}{5} = \frac{9}{5}$

Sol.96.(b) $x^2 + y^2 - 4x + 8y + 20 = 0$

$\Rightarrow (x^2 - 4x + 4) + (y^2 + 8y + 16) = 0$

$\Rightarrow (x - 2)^2 + (y + 4)^2 = 0$

$\Rightarrow x = 2,\ y = -4$

$x^2 + y^2 = 4 + 16 = 20$

Sol.97.(b)

$\frac{(15x-9)}{x} + \frac{(15y-9)}{y} + \frac{(15z-9)}{z} = 0$

$\Rightarrow \frac{(15x-9)yz + (15y-9)xz + (15z-9)xy}{xyz} = 0$

$\Rightarrow 15\ xyz - 9\ yz + 15\ xyz -$

$9\ xz + 15\ xyz - 9xy = 0$

$\Rightarrow 45\ xyz - 9(xy + yz + zx) = 0$

$\Rightarrow 45\ xyz = 9(xy + yz + zx)$

$\Rightarrow \frac{(xy + yz + zx)}{xyz} = 5$

Then the value of $\frac{1}{x} + \frac{1}{y} + \frac{1}{z}$

$= \frac{(xy + yz + zx)}{xyz} = 5$

Shortcut

$\frac{(15x - 9)}{x} + \frac{(15y - 9)}{y} + \frac{(15z - 9)}{z} = 0$

$15 - \frac{9}{x} + 15 - \frac{9}{y} + 15 - \frac{9}{y} = 0$

$45 = 9(\frac{1}{x} + \frac{1}{y} + \frac{1}{z})$

Then, $\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 5$

Sol.98.(c) $\alpha = -\frac{2}{3}\ and\ \beta = -\frac{3}{2}$

Quadratic equation

$\Rightarrow x^2 - (\alpha + \beta)x + \alpha\beta = 0$

$\Rightarrow x^2 - (\frac{-2}{3} + \frac{-3}{2})x + (\frac{-2}{3} \times \frac{-3}{2}) = 0$

$\Rightarrow x^2 + \frac{13}{6}x + 1 = 0$

$\Rightarrow 6x^2 + 13x + 6 = 0$

Sol.99.(a) $2x^2 + bx + 3 = 0$

Product of the roots = $\frac{c}{a} = \frac{3}{2}$

The other root = $\frac{3}{2} \div \frac{1}{2} = 3$

$\alpha = \frac{1}{2}\ and\ \beta = 3$

Quadratic equation

$\Rightarrow x^2 - (\alpha + \beta)x + \alpha\beta = 0$

$\Rightarrow x^2 - (\frac{1}{2} + 3)x + (\frac{1}{2} \times 3) = 0$

$\Rightarrow x^2 - \frac{7}{2}x + \frac{3}{2} = 0$

$\Rightarrow 2x^2 - 7x + 3 = 0$

Hence, value of b = -7

Another Method

$2x^2 + bx + 3 = 0$

On putting x = 0.5 = $\frac{1}{2}$ in the given equation, $2(\frac{1}{2})^2 + b(\frac{1}{2}) + 3 = 0$

$\frac{1}{2} + \frac{b}{2} + 3 = 0 \Rightarrow b = -7$

Sol.100.(c)

$(\frac{x^b}{x^c})^{b+c} \times (\frac{x^c}{x^a})^{c+a} \times (\frac{x^a}{x^b})^{a+b}$

$= x^{(b-c)(b+c)} \times x^{(c-a)(c+a)} \times x^{(a-b)(a+b)}$

$= x^{(b^2-c^2)} \times x^{(c^2-a^2)} \times x^{(a^2-b^2)}$

$= x^{(b^2-c^2+c^2-a^2+a^2-b^2)} = x^0 = 1$

Sol.101.(c) $4^x - 4^{x-1} = 24$

$\Rightarrow 4^x - \frac{4^x}{4} = 24 \Rightarrow \frac{4^x(4-1)}{4} = 24$

$\Rightarrow 4^x = \frac{24 \times 4}{3} \Rightarrow 2^{2x} = 2^5 \Rightarrow 2x = 5$

Now, $\frac{2x-1}{2x+3} = \frac{5-1}{5+3} = \frac{4}{8} = \frac{1}{2}$

Sol.102.(c) $(-7)^{2k+1}\ (-7)^5 = (-7)^{12}$

$\Rightarrow -7^{(2k+1+5)} = -7^{12}$

(Since the base are same)

$\Rightarrow 2k + 6 = 12 \Rightarrow 2k = 12 - 6$

$\Rightarrow 2k = 6 \Rightarrow k = 3$

Sol.103.(d) $x^2 + 3x - 4 = 0$

$\Rightarrow x^2 + 4x - x - 4 = 0$

$\Rightarrow (x + 4)(x - 1) = 0$

$\Rightarrow x = -4\ or\ 1$

a = -4 and b = 1 then $\frac{1}{a} + \frac{1}{b}$

$+ ab = \frac{-1}{4} + 1 + (-4) = \frac{-13}{4}$

Sol.104.(a) $x^2 - 4x + 3 = 0$

$\Rightarrow x^2 - 3x - x + 3 = 0 \Rightarrow x(x - 3) - 1(x - 3) = 0$

$\Rightarrow (x - 3)(x - 1) = 0$

So roots $\Rightarrow x = 3, 1$

Sol.105.(c)

$(\frac{x^a}{x^b})^c \times (\frac{x^b}{x^c})^a \times (\frac{x^c}{x^a})^b \Rightarrow \frac{x^{ac}}{x^{bc}} \times \frac{x^{ab}}{x^{ac}} \times \frac{x^{cb}}{x^{ab}} \Rightarrow \frac{x^{ab+bc+ca}}{x^{ab+bc+ca}} = 1$

Sol.106.(c) By taking options,

Put (x = 3) in both equations

$2x^2 - 5x - 3 = 0$

$2 \times 9 - 5 \times 3 - 3 = 0$

Now ,

$x^2 + x - 12 = 0$

$9 + 3 - 12 = 0$

It satisfies both the equations.

Hence, 3 is the right answer.

Sol.107.(a) $8x^2 + 22x - 21 = 0$

$8x^2 + 28x - 6x - 21 = 0$

$4x(2x + 7) - 3(2x + 7) = 0$

$(4x - 3)(2x + 7) = 0$

$X = \frac{3}{4}$ and $\frac{-7}{2}$

According to the question, $\beta > \alpha$

So, $\alpha = \frac{-7}{2}$ and $\beta = \frac{3}{4}$

Therefore $2\alpha + 3\beta = 2 \times \frac{-7}{2} + 3 \times \frac{3}{4}$

$\Rightarrow -7 + \frac{9}{4} \Rightarrow \frac{-19}{4}$

Sol.108.(d) $x^2 - \frac{11x}{2} + 6 = 0$

$\Rightarrow 2x^2 - 11x + 12 = 0$

$\Rightarrow 2x^2 - 8x - 3x + 12 = 0$

$\Rightarrow 2x(x - 4) - 3(x - 4) = 0$

$\Rightarrow (2x - 3)(x - 4) = 0$

So , $2x - 3 = 0$, $x - 4 = 0$

Therefore, roots (x) = $\frac{3}{2}$, 4

Sol.109.(a)

$P = \frac{x^4 - 8x}{2x^2 + 5x - 3} \times \frac{2x - 1}{x^2 + 2x + 4} \times \frac{x^2 - 9}{x^2 - 2x}$

$\Rightarrow \frac{x(x-2)(x^2+4+2x)}{(2x-1)(x+3)} \times \frac{2x-1}{x^2+2x+4} \times \frac{(x-3)(x+3)}{x(x-2)}$ So, P = x - 3

Now, $P^2 - 1 = (x - 3)^2 - 1$

$\Rightarrow x^2 - 6x + 9 - 1 = x^2 - 6x + 8$

Sol.110.(c) We know that,
$a^3 + b^3 = (a + b)^3 - 3ab(a + b)$
$a^3 + b^3 = (50 + 20)^3 - 3 \times 50 \times 20 (50 + 20)$
$a^3 + b^3 = 343000 - 3000 \times 70$
$a^3 + b^3 = 343000 - 210000 = 1,33,000$

Sol.111.(d) If roots are equal and real then, $b^2 - 4ac = 0$
Now, $k^2 - 4 \times 3 \times 2 = 0 \Rightarrow k^2 = 24$
So, $k = 2\sqrt{6}$
By putting the value of k in
$k^2 - \sqrt{6}k - 12 = 0$
$(2\sqrt{6})^2 - \sqrt{6} \times 2\sqrt{6} - 12$
$\Rightarrow 24 - 12 - 12 = 0$
It satisfies the equation in option (d). Therefore option (d) is the right answer

Sol.112.(b) $x^2 - 5x + 6 = 0$
$\Rightarrow x^2 - 5x + 6 = 0$
$\Rightarrow x^2 - 3x - 2x + 6 = 0$
$\Rightarrow x(x - 3) - 2(x - 3) = 0$
$\Rightarrow (x - 2)(x - 3) = 0$
So, $x - 2 = 0$ and $x - 3 = 0$
Therefore, roots of equation = 2 and 3

Sol.113.(c) we know that ,
$ax^2 + bx + c = 0$
Sum of roots = $\frac{-b}{a}$ and
product of root = $\frac{c}{a}$
now, $x^2 - 5x + 3 = 0$
$\alpha + \beta = 5$ and $\alpha\beta = 3$
So, $\alpha^2 + \beta^2 = 25 - 6 = 19 \Rightarrow \alpha^2\beta^2 = 9$
Therefore, we have to find equation having sum of roots 19 and product of roots 9
$x^2 - (sum\ of\ roots)x + product\ of\ roots = 0$
$x^2 - 19x + 9 = 0$
So, option (c) is the right answer

Sol.114.(d) Quadratic equation:
$x^2 - (sum\ of\ roots)x + product\ of\ roots = 0$
$x^2 - (2 - 3)x + 2 \times (-3) = 0$
$x^2 + x - 6 = 0$

Sol.115.(d) $P = (\frac{1}{x} - \frac{1}{y})[(x + y)^2 - xy] + (\frac{1}{x} + \frac{1}{y})[(x - y)^2 + xy]$
$P = \frac{(y - x)(x^2 + y^2 + xy) + (y + x)(x^2 + y^2 - xy)}{xy}$
$P = \frac{y^3 - x^3 + y^3 + x^3}{xy} = \frac{2y^3}{xy}$
As per the question,
$P \div Q = \frac{2y^3}{xy} \div \frac{y}{x} \Rightarrow \frac{2y^3}{xy} \times \frac{x}{y} = 2y$

Sol.116.(d) Let the roots of equation = $\alpha\ and\ \beta$
According to the question,
$\alpha = \frac{1}{\beta} \Rightarrow \alpha\beta = 1$
In equation ,
$4x^2 - 2x + k - 4 = 0$ Product of roots = $\frac{c}{a}$
$\alpha\beta = \frac{k - 4}{4} \Rightarrow \frac{k - 4}{4} = 1$
$(given,\ \alpha\beta = 1)$
So , $k = 4 + 4 \Rightarrow 8$ is the right answer

Sol.117.(a) $X^2 - 10x + 16 = 0$, then the value of $\alpha^4 - \beta^4$
$x^2 - 10x + 16 = 0$
$\Rightarrow x^2 - 8x - 2x + 16 = 0$
$\Rightarrow (x - 8)(x - 2) = 0 \Rightarrow x = 8\ or\ 2$
$\alpha = 8$ and $\beta = 2$ Now,
$\alpha^4 - \beta^4 = 8^4 - (2)^4 = 4096 - 16 = 4080$

Sol.118.(a) $2x^2 + 4 - 10x = 0$
$\Rightarrow 2x^2 - 10x + 4 = 0$
$a = 2$, $b = -10$, $c = 4$
$b^2 - 4ac = 100 - 32 = 68 > 0$
Hence, roots are real and distinct.

Sol.119.(a) $x^2 - 5x - 14 = 0$
$\Rightarrow x^2 - 7x + 2x - 14 = 0$
$\Rightarrow x(x - 7) + 2(x - 7) = 0$
$\Rightarrow (x - 7)(x + 2) = 0$
$\Rightarrow x = 7\ or\ -2$

Sol.120.(d) $x + y = 8, xy = 15$
$x^2 + y^2 = 64 - 2 \times 15 = 64 - 30 = 34$
$x^4 + y^4 = 34^2 - 2 \times 15^2$
$= 1156 - 450 = 706$

Sol.121.(b) $x^4 + \frac{1}{x^4} = 27$
$x^4 + \frac{1}{x^4} + 2 = 27 + 2$
$(x^2 + \frac{1}{x^2})^2 = 29 \Rightarrow x^2 + \frac{1}{x^2} = \sqrt{29}$

Sol.122.(a) $2x^2 + 9x + 15 = 0$
$D = b^2 - 4ac = 81 - 120 = -39 < 0$
D < 0, so both roots are imaginary or non-real.

Sol.123.(d) $11a^2 + 18a + 7 = 0$
$\Rightarrow 11a^2 + 11a + 7a + 7 = 0$
$\Rightarrow 11a(a + 1) + 7(a + 1) = 0$
$\Rightarrow (11a + 7)(a + 1) = 0$
$\Rightarrow a = -1, \frac{-7}{11}$

Sol.124.(b) We know, $p^3 + q^3 + r^3 - 3pqr = (p + q + r)[(p + q + r)^2 - 3(pq + qr + rq)]$
So, $p^3 + q^3 + r^3 - 3pqr = 13[13^2 - 3 \times 30]$
$\Rightarrow 13 \times 79 = 1027$

Sol.125.(b) As per the question,
Sum of roots = 4+ (- 5) = - 1
Product of roots = 4 × - 5 = - 20
We have to find the equation having sum of roots = -1 and product of roots = -20
By observing options ,
In the equation, $\Rightarrow x^2 + x - 20 = 0$
Sum of roots = $\frac{-b}{a} = \frac{-1}{1} = -1$ and
product of roots = $\frac{c}{a} = \frac{-20}{1} = -20$

Sol.126.(a) $(a + b)(a - b) = a^2 - b^2$
now,
$(4x - 5y)^2 + (5x + 4y)^2 + (4x + 5y)(4x - 5y)$
$\Rightarrow 16x^2 + 25y^2 - 40xy + 25x^2 + 16y^2 + 40xy + 16x^2 - 25y^2 \Rightarrow 57x^2 + 16y^2$

Sol.127.(c) $x(x + 3) - 8 = 2(x + 3)(x - 3)$
$x^2 + 3x - 8 = 2x^2 - 18 \Rightarrow x^2 - 3x - 10 = 0$
For the nature of roots
$b^2 - 4ac = 9 - 4 \times -10 \times 1$
$b^2 - 4ac = 49$
when $b^2 - 4ac > 0$ than Nature of roots are real and distinct
Therefore option c is the correct answer

Sol.128.(d) Sum of roots = $2 + (\frac{-1}{2}) = \frac{3}{2}$
Product of roots = $2 \times \frac{-1}{2} = -1$
By observing options, from option d
$2x^2 - 3x - 2 = 0$
Sum of roots = $\frac{-b}{a} = \frac{3}{2}$
Product of roots = $\frac{c}{a} = \frac{-2}{2} = -1$
It satisfies hence option d is the right answer

Sol.129.(a) $(a + b) = 11$ and $(a - b) = 3$
Adding after squaring both equations
$a^2 + b^2 + 2ab = 121$
$a^2 + b^2 - 2ab = 9$
$2(a^2 + b^2) = 130$
So, $a^2 + b^2 = 65$

Sol.130.(a) $\Rightarrow x^2 = 24 - 10x$
$\Rightarrow x^2 + 10x - 24 = 0$
$\Rightarrow x^2 + 12x - 2x - 24 = 0$
$\Rightarrow x(x + 12) - 2(x + 12) = 0$
$\Rightarrow (x - 2)(x + 12) = 0$
$\Rightarrow (x - 2) = 0, (x + 12) = 0$
Roots $\Rightarrow X = 2$ and -12

Sol.131.(d) $(a - b) = 8$
By squaring both side
$a^2 + b^2 - 2ab = 64 \Rightarrow 160 - 2ab = 64$
$\Rightarrow 2ab = 96 \Rightarrow$ so, $ab = 48$

Sol.132.(a) $11x^2 + 19x + 8 = 0$
$D = b^2 - 4ac = 361 - (4 \times 11 \times 8) = 9$
Roots = $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$= \frac{-19 \pm 3}{2 \times 11} = -1$ or $\frac{-16}{22}$
So, Both roots are negative real

Sol.133.(b) Let the numbers be x and y
ATQ, x + y = 34 and xy = 64
We know that, $(a + b)^2 - 4ab = (a - b)^2$
Now ,
$1156 - 4 \times 64 = (x - y)^2$ $(x - y)^2 = 900$
Therefore, x - y = 30

Sol.134.(a)

Roots of equation = $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
(where a = coefficient of x^2 , b = coefficient of x , c = constant)
So roots of $x^2 + 2x - 6$ is
$\Rightarrow \frac{-2 \pm \sqrt{2^2 - 4 \times 1 \times (-6)}}{2 \times 1}$
$= \frac{-2 \pm \sqrt{4 + 24}}{2} = \frac{-2 \pm 2\sqrt{7}}{2}$
$= -1 \pm \sqrt{7}$

Sol.135.(d) Here, Discrimination (D)
$= b^2 - 4ac = (1)^2 - 4(1)(12) = -47 < 0$
So the roots are imaginary or non-real.

Sol.136.(c) We know that,
In $ax^2 + bx + c = 0$, Sum of roots
$= \frac{-b}{a}$ and product of roots $\frac{-b}{a}$
By observing options, we can see in option (c) $5x^2 + 3x + 2 = 0$
Sum of roots = $\frac{-3}{5}$ and product of root
$= \frac{2}{5}$ In equation $5x^2 - 3x + 2 = 0$
sum of roots is $\frac{-3}{5}$
and product of roots is $\frac{2}{5}$.

Sol.137.(d) $(x + 2)^3 = x(x^2 - 1)$
$\Rightarrow x^3 + 6x^2 + 12x + 8 = x^3 - x$
$\Rightarrow 6x^2 + 13x + 8 = 0$

Sol.138.(c) $4x^2 - 7\sqrt{3}x + 12 = 0$
$D = b^2 - 4ac = 147 - 192 = -45 < 0$
$\Rightarrow D < 0$
Hence, this equation has no real roots.

Sol.139.(a) $4x^2 - 5x - 3 = 0$
discriminant of the equation
$= b^2 - 4ac = 25 + 48 = 73$

Sol.140.(d)
$16x^2 + 4y^2 + 25z^2 - 16xy + 20yz - 40zx$
$= (4x)^2 + (-2y)^2 + (-5z)^2 + (-5z) \times (-2y) + 2 \times 4x \times (-5z)$
$= (4x - 2y - 5z)^2$

Sol.141.(b) $\frac{2^{-2k} \times 4^{k+3}}{4^{-k+2}} = 2^{k-2}$
$\Rightarrow 2^{-2k} \times 4^{k+3-(-k+2)} = 2^{k-2}$
$\Rightarrow 2^{-2k} \times 4^{2k+1} = 2^{k-2}$
$\Rightarrow 2^{-2k} \times 2^{2(2k+1)} = 2^{k-2}$
$\Rightarrow 2^{-2k} \times 2^{4k+2} = 2^{k-2}$
$\Rightarrow 2^{2k+2} = 2^{k-2}$
$\Rightarrow 2k + 2 = k - 2 \Rightarrow k = -4$

Sol.142.(c)
$(x - y)(x + y) + (y - z)(y + z) + (z + x)(z - x)$
$= x^2 - y^2 + y^2 - z^2 + z^2 - x^2 = 0$

Sol.143.(a) $\Rightarrow x^2 - 10x + 21 = 0$
$\Rightarrow x^2 - 7x - 3x + 21 = 0$
$\Rightarrow (x - 7)(x - 3) = 0 \Rightarrow x = 7, 3$

Sol.144.(b) $\frac{1}{(125)^{-y}} = \frac{1}{(5)^{-4y+1}}$
$\Rightarrow (125)^{-y} = (5)^{-4y+1}$
$\Rightarrow 5^{-3y} = (5)^{-4y+1}$
$\Rightarrow -3y = -4y + 1 \Rightarrow y = 1$

Sol.145.(d) $\frac{5^{3n+2}}{5^{4n-1}} = 25$
$\Rightarrow 5^{3n+2-4n+1} = 5^2$
$\Rightarrow -n + 3 = 2 \Rightarrow n = 1$

Sol.146.(d) $x^2 + 10x + 21 = 0$
$\Rightarrow x^2 + 7x + 3x + 21 = 0$
$\Rightarrow (x + 7)(x + 3) = 0$
$\Rightarrow x = -3, -7$

Sol.147.(a)
$(a - b)^3 = a^3 - b^3 - 3ab(a - b)$
$999^3 = (1000 - 1)^3 = (1000)^3 - 1^3 - 3 \times 1000 \times 1(1000 - 1)$
$= 1000000000 - 1 - 3000(1000 - 1)$
$= 997002999$

Sol.148.(b) $49a^2 + 70ab + 25$
$b^2 = (7a)^2 + 2 \times 7a \times 5b + (5b)^2$
$= (7a + 5b)^2$
$(a + b)^2 = a^2 + 2ab + b^2$

Sol.149.(d) $\sqrt{3}x^2 - 8x + 5\sqrt{3} = 0$
$\Rightarrow \sqrt{3}x^2 - 5x - 3x + 5\sqrt{3} = 0$
$\Rightarrow x(\sqrt{3}x - 5) - \sqrt{3}(\sqrt{3}x - 5) = 0$
$\Rightarrow (\sqrt{3}x - 5)(x - \sqrt{3}) = 0$
$\Rightarrow x = \sqrt{3}$ or $\frac{5}{\sqrt{3}}$

Sol.150.(a)
Put $x = \frac{-2}{3}$ in $kx^2 - 13x - 10 = 0$
$\Rightarrow \frac{4}{9}k + \frac{26}{3} - 10 = 0$
$\Rightarrow \frac{4}{9}k = 10 - \frac{26}{3} \Rightarrow \frac{4}{9}k = \frac{4}{3} \Rightarrow k = 3$

Sol.151.(c)
$a^3 + b^3 = (a + b)(a^2 + b^2 - ab)$
$\frac{0.064 + 0.008}{0.16 + 0.04 - 0.08}$
$= \frac{0.4^3 + 0.2^3}{0.4^2 + 0.2^2 - 0.4 \times 0.02}$
$= \frac{(0.4 + 0.2)(0.4^2 + 0.2^2 - 0.4 \times 0.02)}{0.4^2 + 0.2^2 - 0.4 \times 0.02}$
$= 0.4 + 0.2 = 0.6$

Sol.152.(b) According to the formula $(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac$ Therefore,
$(3a + 4b + 5c)^2 = 9a^2 + 16b^2 + 25c^2 + 24ab + 40bc + 30ac$

Sol.153.(d) $\frac{2 + \sqrt{3}}{2 - \sqrt{3}} + \frac{2 - \sqrt{3}}{2 + \sqrt{3}} + 11$
$= \frac{4 + 3 + 4\sqrt{3} + 4 - 4\sqrt{3} + 3}{(2 - \sqrt{3})(2 + \sqrt{3})} + 11$
$= \frac{14}{4 - 3} + 11 = 25$
Now, Square root of 25 = $\sqrt{25} = 5$

Sol.154.(c) In the following equation
$\Rightarrow x^2 + 7x - 60$
$D = b^2 - 4ac$
$= 49 + 240 = 289 > 0$
Since, D > 0 ; So this equation has two real and unequal roots.

Sol.155.(d) $(\frac{y^{b+c}}{y^{2a}})(\frac{y^{c+a}}{y^{2b}})(\frac{y^{a+b}}{y^{2c}})$
$= (\frac{y^{a+b+c+a+b+c}}{y^{2a+2b+2c}})$
$= (\frac{y^{2(a+b+c)}}{y^{2(a+b+c)}}) = 1$

Sol.156.(b) $(x + 1)^2 - 2(x + 1)$
$\Rightarrow x^2 - 1 = 0 \Rightarrow x = -1$ or $+1$
So, this equation has only two real roots.

Sol.157.(b) $a^2 - b^2 = (a + b)(a - b)$
$(6 + 2\sqrt{3})(6 - 2\sqrt{3})$
$= 36 - 12 = 24$ Now, $\sqrt{24} = 2\sqrt{6}$

Sol.158.(d) $a^2 - b^2 = (a + b)(a - b)$
$984^2 - 16^2 = (984 + 16)(984 - 16)$
$= 1000 \times 968 = 968000$

Sol.159.(a) $D = b^2 - 4ac$
$3x^2 - 4x + 10 = 0$
D = 16 - 120 = -104 < 0
Since, D < 0, this equation has no real roots.

Sol.160.(b) $x^2 - 11x + 18 = 0$
$\Rightarrow x^2 - 9x - 2x + 18 = 0$
$\Rightarrow (x - 9)(x - 2) = 0$

$\Rightarrow x = 9\ or\ 2$
$\alpha = 9\ and\ \beta = 2$
$then,\ \alpha^2 + \beta^2 = 81 + 4 = 85$

Sol.161.(b) $2x^2 - 3x - 35 = 0$
$\Rightarrow 2x^2 - 10x + 7x - 35 = 0$
$\Rightarrow (x - 5)(2x + 7) = 0$
$\Rightarrow x = 5\ or\ \frac{-7}{2}$
$\alpha = 5\ and\ \beta = \frac{-7}{2}$
$then,\ \alpha^3 + \beta^3 = 125 - \frac{343}{8} = \frac{657}{8}$

Sol.162.(a) $25 - (x^2 - 9) = (81)^{\frac{1}{2}}$
$\Rightarrow 25 - (x^2 - 9) = 9$
$\Rightarrow (x^2 - 9) = 25 - 9 \Rightarrow (x^2 - 9) = 16$
$\Rightarrow x^2 = 25 \Rightarrow x = 5$

Sol.163.(d)
$(x^2 + 1)(x - 1) = (x^2 - 3)(x + 3)$
$\Rightarrow (x^3 - x^2 + x - 1) = (x^3 + 3x^2 - 3x - 9)$
$\Rightarrow 4x^2 - 4x - 8 = 0$

Sol.164.(a) If discriminant = 0
Then the quadratic equation has two equal roots.

Sol.165.(c) Equation = $2x^2 - 4x - 3 = 0$
Comparing with $ax^2 + bx + c$
a = 2, b = -4, c = -3
$D = b^2 - 4ac = (-4)^2 - 4(2)(-3)$
= 16 + 24 = 40

Sol.166.(d) $3x^2 - 9x + 8 = 0$
Sum of roots = $\frac{-b}{a} = \frac{-(-9)}{3} = 3$
Product of roots = $\frac{c}{a} = \frac{8}{3}$
$a^2 + b^2 = (a + b)^2 - 2ab = (3)^2 - 2 \times \frac{8}{3}$
$= 9 - \frac{16}{3} = \frac{11}{3}$
$(\frac{\alpha}{\beta} + \frac{\beta}{\alpha}) + 4(\frac{1}{\alpha} + \frac{1}{\beta}) =$
$\frac{\alpha^2 + \beta^2}{\alpha\beta} + 4(\frac{\alpha+\beta}{\alpha\beta}) = \frac{11}{3 \times \frac{8}{3}} + 4\ (\frac{3}{\frac{8}{3}})$
$= \frac{11}{8} + \frac{9}{2} = \frac{47}{8} = 5.875$

Sol.167.(b) $x + \frac{10}{X} = 7$
$x^2 - 7x + 10 = 0$
$x^2 - 5x - 2x + 10 = 0$
$x(x - 5) - 2(x - 5) = 0$
$(x - 2)(x - 5) = 0 \Rightarrow x = 2$ and 5
So, roots are 5 and 2.

Sol.168.(d) $\frac{c}{d} + \frac{d}{c} = 1 \Rightarrow c^2 + d^2 = cd$
Then the value of
$\frac{c^3 - d^3}{dc^2 - cd^2} = \frac{(c - d)(c^2 + d^2 + cd)}{cd(c - d)}$
$= \frac{cd + cd}{cd} = 2$

Sol.169.(c) $3x^2 - 2\sqrt{6}x + 2 = 0$
$\Rightarrow 3x^2 - \sqrt{6}x - \sqrt{6}x + 2 = 0$
$\Rightarrow \sqrt{3}x(\sqrt{3}x - \sqrt{2}) - \sqrt{2}(\sqrt{3}x - \sqrt{2}) = 0$
$\Rightarrow (\sqrt{3}x - \sqrt{2})(\sqrt{3}x - \sqrt{2}) = 0$
$\Rightarrow x = \frac{\sqrt{2}}{\sqrt{3}}, \frac{\sqrt{2}}{\sqrt{3}}$

Sol.170.(d) Let the roots of the quadratic equation be $\alpha\ and\ \beta$.
$\alpha = \frac{1}{\sqrt{2}}\ and\ \beta = \frac{1}{\sqrt{2}}$
Now, equation of the quadratic equation
$= x^2 - (\alpha + \beta)x + \alpha\beta$
$= x^2 - (\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}})x + \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}}$
$= x^2 - \sqrt{2}x + \frac{1}{2} \Rightarrow 2x^2 - 2\sqrt{2}x + 1 = 0$

Sol.171.(c) $x^2 - px + q = 0$
Sum of the roots = $\frac{-b}{a} = \frac{p}{1} = p$

Sol.172.(a) Put x = 3
$x^2 - px + 15 = 0 \Rightarrow 9 - 3p + 15 = 0$
$\Rightarrow 3p = 24 \Rightarrow p = 8$
Now, $x^2 + px + q = 0$; for equal roots,
$D = b^2 - 4ac = 0 \Rightarrow x^2 + 8x + q = 0$
$D = 8^2 - 4q$
$0 = 64 - 4q \Rightarrow q = \frac{64}{4} = 16$

Sol.173.(a)
Standard form of a quadratic equation = $ax^2 + bx + c = 0$
Now, from option $5x^2 + 3x - 1 = 0$ is a quadratic equation.

Sol.174.(b)
$(64x^6 - y^6) = [(4x^2)^3 - (y^2)^3]$
$= \{(4x^2) - y^2\} \times [16x^4 + y^4 + 4x^2y^2]$
$\{(x^4 + y^4 + x^2y^2)$
$= (x^2 + y^2 + xy)(x^2 + y^2 - xy)\}$
$= (2x - y)(2x + y)$
$(4x^2 + 2xy + y^2)(4x^2 - 2xy + y^2)$

Sol.175.(a) (x - 4) (x + 1) = 2
$= x^2 - 3x - 4 - 2 = 0 \Rightarrow x^2 - 3x - 6 = 0$

Sol.176.(a) $D = b^2 - 4ac$
$5x^2 + 7x + 4 = 0$
D = 49 - 80 = -31 < 1
Here, D < 1 so, this equation has no real roots.

Sol.177.(c)
$(x + 1)^3 - (x - 1)^3 = 0$
$\Rightarrow (x^3 + 1 + 3x^2 + 3x) -$
$(x^3 - 1 - 3x^2 - 3x) = 0$
$\Rightarrow 3x^2 + 3x + 1 + 1 + 3x^2 + 3x = 0$
$\Rightarrow 6x^2 + 6x + 2 = 0$
$\Rightarrow 3x^2 + 3x + 1 = 0$
$\Rightarrow 3x^2 + 3x + 1 = 0$
$D = b^2 - 4ac < 0$; 9 - 12 = -3 < 0
Here, D < 0 So, this quadratic equation has non- real roots.

Sol.178.(b)
$px^2 + qx + r = 0$, α and β are the roots of the equation.
$\alpha + \beta = \frac{-q}{p}\ and\ \alpha\beta = \frac{r}{p}$
Then $\alpha^2 + \beta^2$
$= (\alpha + \beta)^2 - 2\alpha\beta = (\frac{-q}{p})^2 - 2\frac{r}{p}$
$= \frac{q^2}{p^2} - \frac{2r}{p} = \frac{q^2 - 2pr}{p^2}$

Sol.179.(a) $a^2 - 4a + 1 = 0$
Dividing both sides by a,
$a + \frac{1}{a} = 4$, then $a^2 + \frac{1}{a^2} = 4^2 - 2 = 14$

Sol.180.(b)
$a = \frac{x}{2x + y + z} = \frac{y}{x + 2y + z} = \frac{z}{x + y + 2z}$
Let x = y = z = 1
$a = \frac{1}{4} = \frac{1}{4} = \frac{1}{4}$
Hence, the value of a = $\frac{1}{4}$

Sol.181.(b) $x^2 + 4\sqrt{3}x + 3 = 0$
$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
$= \frac{-4\sqrt{3} \pm \sqrt{(4\sqrt{3})^2 - 4 \times 1 \times 3}}{2 \times 1}$
$= \frac{-4\sqrt{3} \pm 6}{2 \times 1} = 2\sqrt{3} \pm 3$
So, two roots are = $3 + 2\sqrt{3}$ and $3 - 2\sqrt{3}$
So, roots are unequal and irrational

Sol.182.(d) $2^{2x} - 10 \times 2^x + 16 = 0$
$\Rightarrow 2^{2x} - 8 \times 2^x - 2 \times 2^x + 16 = 0$
$\Rightarrow 2^x(2^x - 8) - 2(2^x - 8) = 0$
$\Rightarrow (2^x - 8)(2^x - 2) = 0$
Now, we have $2^x = 8$ and $2^x = 2$
$\Rightarrow 2^x = 2^3$ and $2^x = 2^1$
So, x = 3 or 1
Therefore, the roots of the equation $2^{2x} - 10 \times 2^x + 16 = 0$ are 3 and 1

Sol.183.(a) $4x^2 - 1 = 0$

$\Rightarrow 4x^2 = 1 \Rightarrow x = \sqrt{\frac{1}{4}} = \frac{1}{2}$

Sol.184.(b) In a quadratic equation, when one of roots is a rational coefficient

$(2 + \sqrt{3})$ then the other root = $(2 - \sqrt{3})$

Let the two roots of the quadratic equation be $\alpha \; and \; \beta$.

Now, required equation,

$x^2 - (\alpha + \beta)x + \alpha\beta = 0$

$\Rightarrow x^2 - (2 + \sqrt{3} + 2 - \sqrt{3})x +$

$(2 + \sqrt{3}) \times (2 - \sqrt{3}) = 0$

$\Rightarrow x^2 - 4x + 1 = 0$

Sol.185.(a) (x + y + z) = 0

and $x^2 + y^2 + z^2 = 36$,

$(x + y + z)^2 = x^2 + y^2 + z^2 +$

$2(xy + yz + zx)$

0 = 36 + 2 (xy + yz + zx)

2 (xy + yz + zx) = -36 ⇒ xy + yz + zx = -18

Sol.186.(d)

$a^3 + b^3 = (a + b)(a^2 + b^2 - ab)$

$(x^{\frac{2}{3}} - x^{\frac{1}{3}}y^{\frac{1}{3}} + y^{\frac{2}{3}})(x^{\frac{1}{3}} + y^{\frac{1}{3}})$

$= x^{\frac{1}{3} \times 3} + y^{\frac{1}{3} \times 3} = x + y$

Sol.187.(c) Let the roots are

$\alpha = -3 \; and \; \beta = 3$

Quadratic equation ;

$x^2 - (\alpha + \beta)x + \alpha\beta$

$= x^2 - (-3 + 3)x + \{(-3) \times 3\}$

$= x^2 - 9 = 0$

Sol.188.(c) $x^2 - 5x + 6 = 0$,

$\Rightarrow x^2 - 3x - 2x + 6 = 0$

$\Rightarrow (x - 3)(x - 2) = 0$

$\Rightarrow x = 2 \; or \; 3$

then $a^2 + b^2 - ab = 4 + 9 - 6 = 7$

Sol.189.(a) $ax^2 + bx + c = 0$

$is \; a \; standard \; form \; of \; quadratic \; equation$ 6√3x² + 3√3 + 5x = 0

$\Rightarrow 6\sqrt{3}x^2 + 5x + 3\sqrt{3} = 0$

Product of the numbers

$= \frac{c}{a} = \frac{3\sqrt{3}}{6\sqrt{3}} = \frac{1}{2}$

Sol.190.(b) roots of 5x² - 3x - 4 = 0

Let α and β are two roots of the equation

$\Rightarrow \alpha + \beta = \frac{3}{5}$ and $\alpha \times \beta = \frac{-4}{5}$

Sum of reciprocal of two roots = $\frac{1}{\alpha} + \frac{1}{\beta}$

$= \frac{\alpha + \beta}{\alpha \times \beta} = \frac{-3}{4}$ And $\frac{1}{\alpha\beta} = \frac{-5}{4}$

Therefore, the new equation

$\Rightarrow x^2 + \frac{3}{4}x - \frac{5}{4} = 0 \Rightarrow 4x^2 + 3x - 5 = 0$

Sol.191.(b) We know that,

(a + b)³ = a³ + b³ + 3ab(a + b)

As per the question,

8x³ + 27y³ + 36x²y + 54xy²

⇒ (2x)³ + (3y)³ + 3 × 2x × 3y(2x + 3y)

By applying formula ,

(2x)³ + (3y)³ + 3 × 2x × 3y(2x + 3y)

= (2x + 3y)³

Sol.192.(a)

Given, sum of roots = $\frac{-b}{a} = -7$

and products of roots = $\frac{c}{a}$ = - 12

Therefore Equation → x² +($\frac{-b}{a}$)x + $\frac{c}{a}$ = 0

⇒ x² + (7)x + (- 12) = 0 ⇒ x² + 7x - 12 = 0

So, option a is the right answer.

Sol.193.(d) We know that

(a + b)³ = a³ + b³ + 3a²b + 3ab²

Now ,

(x - y)³ + (x + y)³ + 3(x - y)(x² - y²) + 3 (x + y)(x² - y²)

⇒ (x - y)³ + (x + y)³ + 3(x - y)(x - y)(x + y) + 3(x + y)(x + y)(x - y)

By applying formula,

(x - y)³ + (x + y)³ + 3(x - y)²(x + y) + 3 (x + y)²(x - y) =(x - y + x + y)³ = (2x)³= 8x³

Sol.194.(a) a + b + c = 0 ⇒ b = - (a + c)

By quadratic equation formula

$= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Put value of b in equation

$= \frac{(a + c) \pm \sqrt{(a + c)^2 - 4ac}}{2a}$

$= \frac{(a + c) \pm \sqrt{((a^2 + c^2 + 2ac) - 4ac}}{2a}$

$= \frac{(a + c) + \sqrt{(a - c)^2}}{2a}$ or

$\frac{(a + c) - \sqrt{(a - c)^2}}{2a}$

$= \frac{a + c + a - c}{2a} = \frac{a + a}{2a} = 1$ or

$\frac{a + c - a + c}{2a} = \frac{2c}{2a} = \frac{c}{a}$

So root of equation is = 1 , $\frac{c}{a}$

Sol.195.(c) $(x + 4)(x - 4) = 0$

$\Rightarrow x^2 - 16 = 0$

$D = b^2 - 4ac = 0 + 64 \Rightarrow D = 64$

Sol.196.(d) $(7x - 1)^3 + (7x + 1)^3$

$= 343x^3 - 1 - 147x^2 + 21x + 343x^3 + 1 + 147x^2 + 21x$

$= 686x^3 + 42x$

Sol.197.(c) For the quadratic equation to have real roots, the discriminant must be greater than or equal to zero.

For the first equation

K² - 4(1)(64) ≥ 0

(discriminant = b² - 4ac) ⇒ K² - 256 ≥ 0

⇒ (k - 16)(k + 16) ≥ 0 ⇒ k ≥ 16 and k ≤ -16 For the second equation

64 - 4k ≥ 0 ⇒ k ≤ 16

The value of k that satisfies both the condition is k = 16

Sol.198.(c) $x^2 + 3a^2 = 4ax$

$\Rightarrow x^2 - 4ax + 3a^2 = 0$

Sum of the roots = $\frac{-b}{a} = 4a$

Sol.199.(b) Put x = - 2

$3x^2 + px + 2 = 0$

$\Rightarrow 12 - 2p + 2 = 0 \Rightarrow p = 7$

$Now, \; 7x^2 + px + k = 0$

$\Rightarrow For \; equal \; roots, \; D = 0$

$\Rightarrow b^2 - 4ac = 0 \Rightarrow 7^2 - 28k = 0$

$\Rightarrow k = \frac{49}{28} \; or \; \frac{7}{4}$

Sol.200.(a) $x^2 - kx + 169 = 0$

For equal roots, D = $b^2 - 4ac = 0$

$\Rightarrow k^2 = 169 \times 4 \Rightarrow k = \pm 26$

Sol.201.(c) $(\frac{1}{2}x + 3y - \frac{1}{3}z)^2$.

Using identity : $(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$

$(\frac{1}{2}x + 3y - \frac{1}{3}z)^2 = (\frac{1}{2}x)^2 + (3y)^2 + (-\frac{1}{3}z)^2 + 2(\frac{1}{2}x \times 3y + 3y \times \frac{-1}{3}z + \frac{-1}{3}z \times \frac{1}{2}x)$

$= \frac{1}{4}x^2 + 9y^2 + \frac{1}{9}z^2 + 2(\frac{3}{2}xy - yz - \frac{1}{6}zx)$

$= \frac{1}{4}x^2 + 9y^2 + \frac{1}{9}z^2 + 3xy - 2yz - \frac{1}{3}zx$

Sol.202.(d) $2x^2 - 3x - 5 = 0$

$\Rightarrow 2x^2 - 5x + 2x - 5 = 0$

$\Rightarrow (2x - 5)(x + 1) = 0$

$\Rightarrow x = -1 \; or \; \frac{5}{2}$

$\alpha = -1$ and $\beta = \frac{5}{2}$

Now, $\frac{\alpha}{\beta} = \frac{-2}{5}$ and $\frac{\beta}{\alpha} = \frac{-5}{2}$

Quadratic equation,

$x^2 - (\alpha + \beta)x + \alpha\beta = 0$

$\Rightarrow x^2 - (\frac{-2}{5} + \frac{-5}{2})x + 1 = 0$

$\Rightarrow x^2 + \frac{29x}{10} + 1 = 0$

$\Rightarrow 10x^2 + 29x + 10 = 0$

Sol.203.(a) x² + 19x + 60 = 0

Standard equation : $a^2 + bx + c = 0$

Sum of the roots = $\frac{-b}{a} = -19$

Sol.204.(a) ATQ,

Sum of roots = $\frac{-b}{a} = \frac{5}{3} + (\frac{-3}{4}) = \frac{11}{12}$

Product of roots= $\frac{c}{a} = \frac{5}{3} \times \frac{-3}{4} = \frac{-5}{4}$

Now, $x^2 - (\frac{-b}{a})x + \frac{c}{a} = 0$

Therefore equation = $x^2 - (\frac{11}{12})x + \frac{-5}{4} = 0$

$\Rightarrow 12x^2 - 11x - 15 = 0$

Sol.205.(a) $x^2 - px + 6 = 0$

ATQ, $2^2 - p \times 2 + 6 = 0$

$4 + 6 - 2p = 0 \Rightarrow 2p = 10$, so $p = 5$

Again according to the question ,

For equal roots, $b^2 - 4ac = 0$

$\Rightarrow x^2 + 2px + q = 0$ ...(1)

By putting value of p in equation (1)

Now, $x^2 + 10x + q = 0$

For equal roots we know that

$b^2 - 4ac = 0 = 100 - 4 \times 1 \times q = 0$

$4q = 100$ = Therefore, $q = 25$

Sol.206.(a) $a^2 - b^2 = (a + b)(a - b)$

ATQ,

$(x^2 + xy + y^2)^2 - (x^2 - xy + y^2)^2$

By applying the formula,

$(x^2 + xy + y^2 + x^2 - xy + y^2)(x^2 + xy + y^2 - x^2 + xy - y^2) = 4(xy)(x^2 + y^2)$

Sol.207.(c)

$$\frac{(5p-q)^3-(3p-2q)^3-(q+2p)^3}{13pq-15p^2-2q^2}$$

$$= \frac{3 \times (5p-q)(3p-2q)(q+2p)}{13pq-15p^2-2q^2}$$

$$= \frac{3 \times (15p^2-13pq+2q^2)(q+2p)}{13pq-15p^2-2q^2}$$

$= -3(q + 2p) = -6p - 3q$

Sol.208.(c) $x^2 - 3x + 2 = 0$

Sum of roots (r + s) = $\frac{-b}{a} = 3$

Products of roots (rs) = $\frac{c}{a} = 2$

Now, $(rs)^2 = (2)^2 = 4$ and

$\rightarrow (r + s)^2 = r^2 + s^2 + 2rs$

$r^2 + s^2 = 9 - 4 = 5$

Now, equation having roots

$(r + s)^2$ and $(rs)^2$

$x^2 - (sum\ of\ roots)x + product\ of\ roots = 0$

$x^2 - (5 + 4)x + (5 \times 4) = 0$

$x^2 - (9)x + (20) = 0$

Sol.209.(d) When a + b + c = 0

Then, $a^3 + b^3 + c^3 = 3abc$

$(y - z)^3 + (z - x)^3 + (x - y)^3 = 3(x - y)(y - z)(z - x)$

Sol.210.(a) x = b + c , y = c - a , z = a - b,

$x^2 + y^2 + z^2 - 2xy - 2xz + 2yz = (y + z - x)^2$

Now, put the value of x , y and z

$x^2 + y^2 + z^2 - 2xy - 2xz + 2yz =$

$(c - a + a - b - b - c)^2$

$= (-2b)^2 = 4b^2$

Sol.211.(c) $5x^2 + 4x - 2 = 7x$

$\Rightarrow 5x^2 + 4x - 7x - 2 = 0$

$\Rightarrow 5x^2 - 3x - 2 = 0$

Sol.212.(c) $[(x - y) + \frac{y^2}{x+y}] \div [x^2 + y^2 + \frac{y^4}{x^2-y^2}] \times \frac{y^2}{x-y}$

$= [\frac{x^2-y^2+y^2}{x+y} \div \frac{x^4-y^4+y^4}{x^2-y^2}] \times \frac{y^2}{x-y}$

$= [\frac{x^2}{x+y} \times \frac{x^2-y^2}{x^4}] \times \frac{y^2}{x-y}$

$= \frac{x-y}{x^2} \times \frac{y^2}{x-y} = \frac{y^2}{x^2}$

Sol.213.(d) Put $x = \frac{2}{3}$ in quadratic equation $7x^2 + kx - 3 = 0$

$\Rightarrow \frac{28}{9} + \frac{2k}{3} - 3 = 0$

$\Rightarrow \frac{2k}{3} = 3 - \frac{28}{9}$

$\Rightarrow \frac{2k}{3} = -\frac{1}{9} \Rightarrow k = -\frac{1}{6}$

Now, from options, $12k^2 - 4k - 1 = 0$, this equation satisfies the value of x.

Sol.214.(d) Given expression,

$x^2 + 3x + 12 - 2(x^3 - x + 4)$

$= x^2 + 3x + 12 - 2x^3 + 2x - 8$

$= 4 + 5x + x^2 - 2x^3$

Sol.215.(c) $x^2 + 4x - 21 = 0$

$\Rightarrow x^2 + 7x - 3x - 21 = 0$

$\Rightarrow (x + 7)(x - 3) = 0 \Rightarrow x = -7\ or\ 3$

Now, p = -7 or q = 3

New roots,

$\alpha = p - 1 = -8\ and\ \beta = q + 1 = 4$

Standard quadratic equation, a

$x^2 - (\alpha + \beta)x + \alpha\beta = 0$

$= x^2 - (-8 + 4)x - 32 = 0$

$= x^2 - (-4)x - 32 = 0$

$= x^2 + 4x - 32 = 0$

Sol.216.(b) $x^2 - 5x - 6 = 0$

$\Rightarrow x^2 - 6x + x - 6 = 0$

$\Rightarrow (x - 6)(x + 1) = 0$

$\Rightarrow x = 6\ or\ -1$

a = 6 and b = -1

Then, $(a - b)^2 = (6 - (-1))^2 = 49$

Sol.217.(d) For equal roots, D = 0 ;

$D = b^2 - 4ac = ax^2 - 4x + 1 = 0$

$\Rightarrow D = b^2 - 4ac \Rightarrow 16 - 4a = 0$

$\Rightarrow a = 4$

Sol.218.(b) $x + y = 5\ \ and\ \ xy = 4$

$x^2 + y^2 = 25 - 8 = 17$

Then, $x^3 + y^3 = (x + y)(x^2 + y^2 - xy)$

$= 5 \times (17 - 4) = 65$

Sol.219.(a) $X + \frac{20}{x} = 9$

$\Rightarrow \frac{x^2 + 20}{x} = 9 \Rightarrow x^2 - 9x + 20 = 0$

$\Rightarrow x^2 - 5x - 4x + 20 = 0$

$\Rightarrow x(x - 5) - 4(x - 5) = 0$

$\Rightarrow (x - 5)(x - 4) = 0$

Hence roots of the equation (x) = 4 , 5

Sol.220.(c) In the equation $x^2 + 5x + 6 = 0$

Sum of roots ($\alpha + \beta$) = $\frac{-b}{a} = -5$

Product of roots ($\alpha\beta$) = $\frac{c}{a} = 6$

ATQ, $\alpha\beta - (\frac{1}{\alpha} + \frac{1}{\beta}) \Rightarrow \alpha\beta - (\frac{\alpha + \beta}{\alpha\beta})$

Now ,

$\Rightarrow 6 - (\frac{-5}{6}) = 6 + \frac{5}{6} = \frac{41}{6}$

Sol.221.(d) Let the number be x and y

Given, x - y = 4 and xy = 32

Now,

$(x - y)^3 = x^3 - y^3 - 3xy(x - y)$

$\Rightarrow x^3 - y^3 = (x - y)^3 + 3xy(x - y)$

$\Rightarrow x^3 - y^3 = 4^3 + 3 \times 32 \times 4$

So, $x^3 - y^3 = 64 + 384 = 448$

Sol.222.(c) Sum of roots = 2 - 3 = -1 and product of roots = $2 \times -3 = -6$

Now ,

$x^2 - (\text{Sum of roots})x + \text{product of roots} = 0$

$\Rightarrow x^2 - (-1)x + -6 = 0$

Therefore, equation will be

$x^2 + x - 6 = 0$

Sol.223.(a) $\frac{1}{x+3} + \frac{1}{x+5} = \frac{1}{6}$

$\Rightarrow \frac{x+5+x+3}{(x+3)(x+5)} = \frac{1}{6}$

$\Rightarrow \frac{2x+8}{x^2+5x+3x+15} = \frac{1}{6}$

$\Rightarrow 12x + 48 = x^2 + 5x + 3x + 15$

$\Rightarrow x^2 - 4x - 33 = 0$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = \frac{4 \pm \sqrt{16 + 4 \times 33}}{2}$

$x = \frac{4 \pm \sqrt{148}}{2} \Rightarrow x = \frac{4 \pm 2\sqrt{37}}{2}$

So, $x = 2 \pm \sqrt{37}$

Sol.224.(a) $2(2x - 3) + 4(\frac{x^2}{2} - 3x + 4)$

$\Rightarrow 4x - 6 + 2x^2 - 12x + 16$

$\Rightarrow 4x - 6 + 2x^2 - 12x + 16$

⇒ 2x² - 8x +10

Sol.225.(b) Given, y = 2^{3x}

$4^{3x} - 8^{x+1} + 16 = 0$

$(2^{3x})^2 - 8 \times 8^x + 16 = 0$

Now, by putting the value of 2^{3x}

y² - 8y + 16 = 0

Sol.226.(d) a = 28 - 5√12 = 28 - 10√3

b = 2 + √3

a√3 + b = (28 - 10√3) × √3 + 2 + √3

a√3 + b = 28√3 - 30 + 2 + √3

a√3 + b = 29√3 - 28 or -28 + 29√3

Sol.227.(a)

$x^2y - xy^2 : yz(x - y) :: xa^2 - xb^2 : w$

$\frac{x^2y - xy^2}{yz(x-y)} = \frac{xa^2 - xb^2}{w}$

$\frac{xy(x-y)}{yz(x-y)} = \frac{x(a^2 - b^2)}{w}$

$\frac{1}{z} = \frac{(a^2 - b^2)}{w}$

⇒ w = z(a² - b²) or za² - zb²

Sol.228.(d) If one root = 4 + √3 then another root = 4 - √3 (always)

Sum of roots = 4 + √3 + 4 - √3 = 8

Product of roots = (4 + √3) (4 - √3) = 13

Hence, equation = x² - 8x + 13 = 0

Sol.229.(a) Sum of roots

= 3 + $2\sqrt{2}$ +3 - $2\sqrt{2}$ = 6

Product of roots

= (3 + $2\sqrt{2}$)(3 - $2\sqrt{2}$) = 1

Now,

x² - (Sum of roots) x + Product of roots = 0

x² - 6x + 1 = 0

So , option (a) is the right answer.

Sol.230.(a) $2xy^2 : 2x^2y :: 2x^2y : z$

$\frac{2xy^2}{2x^2y} = \frac{2x^2y}{z}$

$\frac{y}{x} = \frac{2x^2y}{z}$ ⇒ z = 2x³

Sol.231.(b) Let the roots of the equation be α and β

ATQ, α = $\frac{1}{\beta}$ So, αβ =1

Now , from equation,

$(k+1)x^2 - 13kx + 7 - 2k = 0$

Product of roots (αβ) = $\frac{c}{a} = \frac{7-2k}{k+1}$

By equating the value of αβ

⇒ $\frac{7-2k}{k+1}$ = 1

⇒ 7 − 2k = k + 1 ⇒ 3k = 6 So , k = 2

Sol.232.(c) $x = \sqrt{13 + 2\sqrt{40}}$

= $\sqrt{(\sqrt{8} + \sqrt{5})^2}$ = √8 + √5

$y = \sqrt{13 - 2\sqrt{40}}$, = $\sqrt{(\sqrt{8} - \sqrt{5})^2}$

= √8 - √5

x - y = (√8 + √5) - (√8 - √5)

= √8 + √5 - √8 + √5 = 2√5

Sol.233.(a) a = $(\frac{3}{7})^2 \div (\frac{9}{7})^0$

We know, a^0 = 1 (always)

a = $\frac{9}{49} \div 1$ a = $\frac{9}{49}$

$a^{-2} = (\frac{49}{9})^2 = \frac{2401}{81}$

Sol.234.(a)

$(5x^2 - 5) + 5(-x^2 + 2x - 7) = 0$

5x² - 5 - 5x² + 10x - 35 = 0

⇒10x = 40 ⇒ x = 4

Sol.235.(b) x = 2

$\sqrt{(4x)(x) + 4x + 1}$ + 5x

$\sqrt{(4\times2)(2) + 4(2) + 1}$ + 5(2)

$\sqrt{16 + 8 + 1}$ + 10 = 5 + 10 = 15

Sol.236.(d) Equation = 2x² + 9x - 5 =0

Discriminant = b² – 4ac

= (9)² – 4 × 2 × (- 5) = 81 + 40 = 121

Sol.237.(c) Let the number = x, then

reciprocal = $\frac{1}{x}$

x + $\frac{1}{x}$ = -2 ⇒ x² + 1 = -2x

x² + 2x + 1 = 0 [Quadratic equation]

(x + 1)² = 0 ⇒ x = -1

So, required equation = x² + 2x + 1 = 0 and x = -1

Sol.238.(d) Formula

→ $(a^3 - b^3) = (a - b)(a^2 + ab + b^2)$

$(x^{\frac{2}{3}} - x^{\frac{-2}{3}})(x^{\frac{4}{3}} + 1 + x^{\frac{-4}{3}})$

= $(x^2 - x^{-2}) = (x^2 - \frac{1}{x^2})$

Sol.239.(a) 4a + 3b = 2c

Put a = 1, b = 2

4a + 3b = 2c

4(1) + 3(2) = 2c C = 5

Now, put values of a, b and c

(4a)³ + (3b)³ + (-2c)³

64 × (1)³ + 27 × (2)³ - 8(5)³

64 + 216 - 1000 = -720

Now, go through options

-72abc = -72 × 1 × 2 × 5 = -720 (Satisfy)

Sol.240.(c) Roots = (√3 + 1) and (√3 - 1)

Sum of roots = √3 + 1 + √3 - 1 = 2√3

Product of roots = (√3 + 1) × (√3 - 1) = 2

Equation = ax² - bx + c

So, required equation = x² - 2√3x + 2

Sol.241.(a)

$x^4 - (x^2 - 2)^2 + (2 - x) = 0$ is x⁴ - x⁴ - 4 + 4x² + 2 - x = 0

4x² - x - 2 = 0

Hence, on solving the following, we get the quadratic equation.

Sol.242.(d) Equation = ax² - bx + c

Sum of roots = b = m + n

Product of roots = c = mn

So, required equation

= x² - (m + n)x + mn=0

Sol.243.(a) y³ - xy² - x²y + x³

y² (y - x) - x² (y - x) ⇒ (y² - x²)(y - x)

(y - x)(y + x)(y - x) ⇒ (y - x)² (y + x)

Sol.244.(a) (x + 2y - 3z)²

By formula of (a + b -c)²

x² + (2y)² + (3z)² + 2 × 2xy - 2 × 2y × 3z - 2 × 3z × x

x² + 4y² + 9z² + 4xy - 12yz - 6xz

Sol.245.(a) (x - y)² = x² + y² - 2xy

9² = x² + y² - 2 × 16

81 = x² + y² - 32

x² + y² = 113

Sol.246.(d) (u - v)² = u²+ v² - 2uv

4² = u²+ v² - 2(20)

16 = u²+ v² - 40 ⇒ u²+ v² = 56

u³ - v³ = (u - v)(u² + v² + uv)

u³ - v³ = 4(56 + 20) = 304

Sol.247.(d) Number = 1155 = 33 × 35

If x is smaller number then x = 33

Now, put the value of x in the given options, From option (d),

x² + 2x - 1155 = 0(33)² + 2(33) - 1155 = 0

1089 + 66 - 1155 = 0 ⇒ 1155 - 1155 = 0

0 = 0 (satisfy)

Sol.248.(c) If u + v = − 2 and u² + v² = 16,

(u + v)² = u² + v² + 2uv

(−2)² = 16 + 2uv

uv = −6

(u − v)² = (u + v)² − 4uv

(u − v)² = (−2)² − 4(− 6)

(u − v)² = 4 + 24 = 28

Sol.249.(c) $(x+1)(x-1)(x^2+1)$

Using identity: (a - b)(a + b) = (a² - b²)

$(x^2 - 1)(x^2 + 1) = (x^4 - 1)$

Sol.250.(a) (x − m)(x − n) = k

⇒$x^2 - x(m+n) + mn = k$

⇒$x^2 - x(m+n) + (mn - k) = 0$

Sum of roots (a+b) = m+n

Product of roots (ab)

= (mn - k) ..... e.q .(1)

Now ,

(x − a)(x − b) = −k

⇒$x^2 - x(a+b) + ab = -k$

$\Rightarrow x^2 - x(a + b) + ab + k = 0$
On substituting values from eq(i)
$\Rightarrow x^2 - x(m + n) + mn = 0$
Sum of roots = m+n
Product of roots = mn
Clearly , Roots are m and n .

Sol.251.(a) Let the number = x
$x + \frac{1}{x} = 7 \Rightarrow x^2 - 7x + 1 = 0$
$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
$= \frac{7 \pm \sqrt{(-7)^2 - 4(1)(1)}}{2 \times 1}$
$= \frac{7 + 3\sqrt{5}}{2}$ or $\frac{7 - 3\sqrt{5}}{2}$
So, option (a) is correct.

Sol.252.(d) Let the numbers are a and b
According to question,
a + b = 25 , ab = 136
By hit and trial method, a = 17 and b = 8
$a^3 + b^3 = 17^3 + 8^3 = 4913 + 512 = 5425$

Sol.253.(c) $(y^2x)^4 \times (y^2x)^{-4}$
$(y^2x)^4 \times \frac{1}{(y^2x)^4} = 1$

Sol.254.(b)
$2(x^2 + y^2)^2 - 3xy(x^2 + y^2) - 2x^2y^2$
By solving we get,
$2(x^4 + y^4 + 2x^2y^2) - 3x^3y - 3xy^3 - 2x^2y^2$
$2x^4 + 2y^4 + 4x^2y^2 - 3x^3y - 3xy^3 - 2x^2y^2$
$2x^4 + 2y^4 + 2x^2y^2 - 3x^3y - 3xy^3$
.....(1)
Now applying hit and trial method in all options we found only (b) satisfies so as per that,
$(2x^2 + 2y^2 + xy)(x^2 + y^2 - 2xy)$
$2x^4 + 2x^2y^2 - 4x^3y + 2x^2y^2 +$
$2y^4 - 4xy^3 + x^3y + xy^3 - 2x^2y^2$
By solving we get,
$2x^4 + 2y^4 + 2x^2y^2 - 3x^3y - 3xy^3$
..... (2)
Hence equation (1) and (2) is equal hence option (b) is the right answer.

Sol.255.(b) $\frac{z(x^3 - y^3)}{x^2 + xy + y^2} + \frac{x(y^3 - z^3)}{y^2 + yz + z^2} + \frac{y(z^3 - x^3)}{z^2 + zx + x^2}$
$= \frac{z(x - y)(x^2 + xy + y^2)}{x^2 + xy + y^2} + \frac{x(y - z)(y^2 + yz + z^2)}{y^2 + yz + z^2} + \frac{y(z - x)(z^2 + zx + x^2)}{z^2 + zx + x^2}$
z(x - y) + x(y - z) + y(z - x)
zx - zy + xy - xz + yz - xy = 0

Sol.256.(b) $x^2 + 5x + 4 = 0$
$x^2 + 4x + x + 4 = 0$
x(x + 4) + 1(x + 4) = 0
(x + 1)(x + 4) = 0
x = -1 and -4
So, a = -1 and b = -4
$\frac{a^3 + b^3}{a^2 + b^2 - 4} = \frac{(-1)^3 + (-4)^3}{(-1)^2 + (-4)^2 - 4}$
$= \frac{-65}{13} = -5$

Sol.257.(d) $\frac{x^2 + 3x - 10}{x^2 - 25} \times \frac{x^2 + 3x + 2}{x^2 - 4} \times \frac{x(x + 2)}{(x + 1)^2 + (x + 1)}$
$= \frac{(x + 5)(x - 2)}{(x + 5)(x - 5)} \times \frac{(x + 2)(x + 1)}{(x + 2)(x - 2)} \times \frac{x(x + 2)}{x^2 + 3x + 2} = \frac{(x + 1)}{(x - 5)} \times \frac{x(x + 2)}{x^2 + 3x + 2}$
$= \frac{(x + 1)}{(x - 5)} \times \frac{x(x + 2)}{x^2 + 2x + x + 2}$
$= \frac{(x + 1)}{(x - 5)} \times \frac{x(x + 2)}{x(x + 2) + 1(x + 2)}$
$= \frac{(x + 1)}{(x - 5)} \times \frac{x(x + 2)}{(x + 2)(x + 1)} = \frac{x}{(x - 5)}$

Sol.258.(a) $x^2 - 6x + 5 = 0$
$x^2 - 5x - x + 5 = 0$
$x(x - 5) - 1(x - 5) = 0$
$(x - 5)(x - 1) = 0$
$x = 5$ and 1
So, roots are 5 and 1

Sol.259.(b) $\frac{(3x^2)^5}{(6x^{-2})^2} = \frac{(3)^5(x^2)^5}{(6\frac{1}{x^2})^2}$
$= \frac{(3)^5(x^2)^5}{36(\frac{1}{x^2})^2} = \frac{243 \times (x^2)^5}{36(\frac{1}{x^2})^2} = \frac{27x^{14}}{4}$

Sol.260.(a) $y = \sqrt[3]{6} - 4$
$y + 4 = \sqrt[3]{6}$
On cubing both the sides, we get
$y^3 + 64 + 12y(y + 4) = 6$
$y^3 + 64 + 12y^2 + 48y = 6$
So, $y^3 + 12y^2 + 48y + 100$
$= [y^3 + 64 + 12y^2 + 48y] + [36]$
$= 6 + 36 = 42$

Sol.261.(a) $x = \frac{2 + \sqrt{3}}{2 - \sqrt{3}}$,
$x = \frac{2 + \sqrt{3}}{2 - \sqrt{3}} \times \frac{2 + \sqrt{3}}{2 + \sqrt{3}} = (2 + \sqrt{3})^2$
$= 4 + 3 + 4\sqrt{3}$, $x = 7 + 4\sqrt{3}$
$(x - 7)^2 = (7 + 4\sqrt{3} - 7)^2$
$= (4\sqrt{3})^2 = 48$

Sol.262.(b) a = 6, b = -13 and c = 6
We know,
Product of the root = $\frac{c}{a} = \frac{6}{6} = 1$

Sol.263.(c) $x^4 - 6x^2 - 1 = 0$
On dividing by x^2, $x^2 - \frac{1}{x^2} = 6$
On cubing both sides,
$(x^2)^3 - (\frac{1}{x^2})^3 = 6^3$
$x^6 - \frac{1}{x^6} - 3 \times x^2 \times \frac{1}{x^2}(x^2 - \frac{1}{x^2}) = 216$
$x^6 - \frac{1}{x^6} - 3 \times 6 = 216 \Rightarrow x^6 - \frac{1}{x^6} = 234$
Again,
$x^2 - \frac{1}{x^2} = 6$ (On squaring both sides)
$(x^2)^2 - (\frac{1}{x^2})^2 = 6^2$
$x^4 + \frac{1}{x^4} - 2 = 36 \Rightarrow x^4 + \frac{1}{x^4} = 38$
$(x^6 - \frac{1}{x^6}) - 3(x^4 + \frac{1}{x^4}) = 234 - 3(38) = 120$

Sol.264.(c) Equation = $2y^2 - 6y - 7 = 0$
Here, a = 2, b = -6
Sum of solution = $\frac{-b}{a} = \frac{-(-6)}{2} = 3$

Sol.265.(a) (y + z) = 8 and yz = 6
$(y - z)^2 = (y + z)^2 - 4yz$
$= 64 - 24 = 40$

Sol.266.(c) $x(x + y + z) = 30$..... (1)
$y(x + y + z) = 64$..... (2)
$z(x + y + z) = 50$..... (3)
Adding eq . (1), (2) and (3);
Taking $(x + y + z)$ common
(x + y + z) (x + y + z) = 144
$(x + y + z)^2 = 144$
2 (x + y + z) = 2 × 12 = 24

Sol.267.(b) By option, $x^2 + 4x + 5 = 0$
$D = b^2 - 4ac = 16 - 20 = -4 < 0$
This equation cannot have real roots.

Sol.268.(b) $x + \frac{1}{x} = 4$
Then , $\frac{4x^2 + 4}{9x^2 + 10x + 9} = \frac{4x(x + \frac{1}{x})}{x[9(x + \frac{1}{x}) + 10]}$
$= \frac{4 \times 4}{9 \times 4 + 10} = \frac{16}{46} = \frac{8}{23}$

Sol.269.(d) $y^2 - z^2 = (y + z)(y - z)$
$y - z = \frac{225}{25} = 9$ ..... (1)
$y + z = 25$ ..... (2)
On solving eq .(1) and (2), we get
z = 8

Sol.270.(d) Let the roots be α and 2α

According to question,

$\alpha + 2\alpha = \frac{-(-3)}{2} = \frac{3}{2}$

$3\alpha = \frac{3}{2} \Rightarrow \alpha = \frac{1}{2}$.....(1)

and $\alpha \times 2\alpha = \frac{a}{2} \Rightarrow 2\alpha^2 = \frac{a}{2} \Rightarrow a = 4\alpha^2$

$a = 4 \times \frac{1}{4} = 1$.... (from eq . 1)

Sol.271.(d) $9(x+9)^2 = 441$

$(x+9)^2 = 49 \Rightarrow (x+9) = \pm 7$

$x = -2, -16$

Sol.272.(a)

$a^3 - b^3 = 625$, $a^2 - b^2 = 25$ and $a + b = 5$

We know, $a^2 - b^2 = (a+b)(a-b)$

$\Rightarrow (a+b)(a-b) = 25$

$\Rightarrow (a-b) = 5$

Again we know,

$a^3 - b^3 = (a-b)(a^2 + ab + b^2)$

$\Rightarrow (a-b)(a^2 + ab + b^2) = 625$

$\Rightarrow a^2 + ab + b^2 = \frac{625}{5}$

$\Rightarrow a^2 + ab + b^2 = 125$

Sol.273.(d) If $x^2 - 2x + 1 = 0$,

$\Rightarrow x^2 + 1 = 2x \Rightarrow x + \frac{1}{x} = 2$

$\Rightarrow x - \frac{1}{x} = 0$ .....

$(x - \frac{1}{x}) = \sqrt{(x + \frac{1}{x})^2 - 4}$

Then the value of $x^3 - \frac{1}{x^3} = (x - \frac{1}{x})$

$(x^2 + \frac{1}{x^2} + 1) = 0$

Short Tricks :-

When , $x^2 - 2x + 1 = 0$

$\Rightarrow x + \frac{1}{x} = 2$, clearly the value of x = 1

Putting the value of x in given equation :-

$x^3 - \frac{1}{x^3} = 1 - 1 = 0$

Sol.274.(d)

Given, a + b = 8 and $a^2 + b^2 = 12$,

So, $a^2 + b^2 = (a+b)^2 - 2ab$

$\Rightarrow 2ab = 64 - 12 \Rightarrow ab = 26$

Again we know, if a + b = x,

then $a^3 + b^3 = x^3 - 3ab$,

So, $a^3 + b^3 = 8^3 - 3 \times 8 \times 26$

$\Rightarrow a^3 + b^3 = 512 - 624 \Rightarrow -112$

Sol.275.(a) As we know, if a + b + c = 0 then $a^3 + b^3 + c^3 = 3abc$.

Here, a = (x - y), b = (y - z), c = (z - x) and (x - y) + (y - z) + (z - x) = 0,

So, $(x-y)^3 + (y-z)^3 + (z-x)^3 = 3(x-y)(y-z)(z-x)$.

Sol.276.(b) $\sqrt{1225 \times \sqrt{32 \div x}} = 70$

Squaring both sides we get,

$\Rightarrow 1225 \times \sqrt{32 \div x} = 70 \times 70$

$\Rightarrow \sqrt{32 \div x} = 4 \Rightarrow \frac{32}{x} = 16 \Rightarrow x = 2$

Sol.277.(b) Given, $x^4 + \frac{1}{x^4} = 194$

$\Rightarrow (x^2 + \frac{1}{x^2})^2 - 2 = 194$

$\Rightarrow (x^2 + \frac{1}{x^2}) = 14 \Rightarrow (x + \frac{1}{x})^2 - 2 = 14$

$\Rightarrow (x + \frac{1}{x}) = 4$

So, $x^3 + \frac{1}{x^3} = (x + \frac{1}{x})^3 - 3(x + \frac{1}{x})$

= 64 -12 = 52

Sol.278.(a) As we know,

$\Rightarrow a^2 + b^2 = (a+b)^2 - 2ab$, & $a^3 + b^3$

$= (a+b)^3 - 3ab$

So, $a^2 + b^2 = 10^2 - 2ab = 68 \Rightarrow ab = 16$

$a^3 + b^3 = (a+b)^3 - 3ab(a+b)$

$= 10^3 - 3 \times 16(10) = 1000 - 480 = 520$

Sol.279.(b) Let xy = X

Now we have, $X^2 + \frac{1}{X^2} = 83$

$\therefore (X - \frac{1}{X})^2 = X^2 + \frac{1}{X^2} - 2 = 83 - 2 = 81$

So, $X - \frac{1}{X} = 9 \quad \Rightarrow \quad \therefore xy - \frac{1}{xy} = 9$

Sol.280.(d) $\sqrt{x} = 8$

Squaring both sides,

x = 64 and, $x^2 = 4096$

Given, $x^2 + y = 4112$

$\Rightarrow 4096 + y = 4112 \Rightarrow y = 16 \Rightarrow \sqrt{y} = 4$

Sol.281.(b) x = 2 and y = 5,

$\Rightarrow 5xy - y^2 = 50 - 25 = 25$

Sol.282.(b) $\frac{1}{5\sqrt{2} - 7} = a\sqrt{2} + b$

$\frac{5\sqrt{2}+7}{5\sqrt{2}+7} \times \frac{1}{5\sqrt{2}-7} = a\sqrt{2} + b$

$\frac{5\sqrt{2}+7}{50-49} = a\sqrt{2} + b$

$5\sqrt{2} + 7 = a\sqrt{2} + b$

On comparing we get,

a = 5 and b = 7

Sol.283.(b) $8m^3 - n^3$

$= (2m)^3 - n^3$

$= (2m - n)(4m^2 + n^2 + 2mn)$

Sol.284.(b) The given quadratic equation is $2x^2 - 8x - m = 0$,

Now let the roots are α & β.

We know that, $\alpha + \beta = \frac{-b}{a}$ &

$\alpha\beta = \frac{c}{a}$

[where a = 2, b = - 8, c = - m]

$\Rightarrow \alpha + \beta = 4$ & $\alpha\beta = \frac{-m}{2}$

As one root of the equation is $\alpha = \frac{5}{2}$

$\Rightarrow \beta = (4 - \frac{5}{2}) = \frac{3}{2}$

$\Rightarrow m = -2\alpha\beta = -2 \times \frac{5}{2} \times \frac{3}{2}$

$= -\frac{15}{2}$

Sol.285.(a) $P = 2 + \sqrt{3}$ $Q = 2 - \sqrt{3}$,

then $\frac{P}{Q} = \frac{2+\sqrt{3}}{2-\sqrt{3}}$

After rationalization,

$= \frac{2+\sqrt{3}}{2-\sqrt{3}} \times \frac{2+\sqrt{3}}{2+\sqrt{3}}$

$= \frac{7+4\sqrt{3}}{4-3} = \frac{7+4\sqrt{3}}{1}$

Sol.286.(a) $x\sqrt{12} = 4 + x\sqrt{3}$

$\Rightarrow 2x\sqrt{3} = 4 + x\sqrt{3}$

$\Rightarrow x\sqrt{3} = 4 \Rightarrow x = \frac{4}{\sqrt{3}}$

So, the value of x is $\frac{4}{\sqrt{3}}$

Sol.287.(a) Given equations are

$2x^2 + px - 15 = 0$ and $P(kx^2 + x) = 0$

-5 is a root of both the given equations so it must satisfy the equations.

Put x = -5 in first equation,

$\Rightarrow 2 \times (-5)^2 + p(-5) - 15 = 0$

$\Rightarrow 50 - 5p - 15 = 0 \Rightarrow 35 - 5p = 0$

$\Rightarrow 35 = 5p \Rightarrow p = 7$

Now put x = -5 and p = 7 in second equation,

$\Rightarrow 7\{k(-5)^2 + (-5)\} = 0$

$\Rightarrow 7(25k - 5) = 0 \Rightarrow 25k = 5$

$\Rightarrow k = \frac{5}{25} = 0.2$

Sol.288.(b) $(a+b)^2 = a^2 + b^2 + 2ab$

$\Rightarrow (a+b)^2 = 82 + 2 \times 9$

$\Rightarrow (a+b)^2 = 100 \Rightarrow (a+b) = 10$

Now, $(a+b)^3 = a^3 + b^3 + 3ab(a+b)$

$\Rightarrow 10^3 = a^3 + b^3 + 3 \times 9 \times 10$

$\Rightarrow 1000 = a^3 + b^3 + 270$

$\Rightarrow a^3 + b^3 = 1000 - 270 = 730$

Sol.289.(b) Given, $x^4 + x^{-4} = 1154$

$\Rightarrow x^4 + \frac{1}{x^4} = 1154$

$\therefore x^2 + \frac{1}{x^2} = \sqrt{1154 + 2} = \sqrt{1156} = 34$

Now, $x + \frac{1}{x} = \sqrt{34 + 2} = \sqrt{36} = 6$

Sol.290.(c) a = 17, b = 15 and c = -32
a + b + c = 0
$a^3 + b^3 + c^3 - 3abc$ = (a + b + c)
$[(a + b + c)^2$ - 3(ab + bc + ca)]
$a^3 + b^3 + c^3$ - 3abc = 0

Sol.291.(c) $x = 2 - \sqrt{3}$ then $\frac{1}{x} = 2 + \sqrt{3}$

$\Rightarrow x - \frac{1}{x} = 2 - \sqrt{3} - (2 + \sqrt{3}) = -2\sqrt{3}$

Sol.292.(d) $a = \frac{\sqrt{3}+1}{\sqrt{3}-1} \times \frac{\sqrt{3}+1}{\sqrt{3}+1}$
(using rationalisation)
$= \frac{4 + 2\sqrt{3}}{2} = 2 + \sqrt{3}$
$b = 2 - \sqrt{3} = \frac{1}{a}$
$a + \frac{1}{a} = 2 + \sqrt{3} + 2 - \sqrt{3} = 4$
$= a^2 + b^2 - 4 = a^2 + \frac{1}{a^2} - 4 = 14 - 4 = 10$

Sol.293.(d) Sum of zeroes = $\alpha + \beta = -9$
Product of zeroes = $\alpha\beta = 3k$
And given that, $\alpha^2 + \beta^2 = 21$
$(\alpha + \beta)^2 = \alpha^2 + \beta^2 + 2\alpha\beta$
$\Rightarrow 81 = 21 + 2 \times 3k$
$\Rightarrow 6k = 60 \quad \Rightarrow k = 10$

Sol.294.(c)
Sum of zeroes = $\alpha + \beta = 5$ ------ (1)
Product of zeroes = $\alpha\beta$ = m --------(2)
And given that, $\alpha - \beta = 1$ ----------(3)
On solving equation (1) and (3), we get
$\alpha = 3$ and $\beta = 2$
From equation (3)
m = 3 × 2 = 6

Sol.295.(a) For equal roots D = 0
$b^2 - 4ac = 0$ ------ (1)
Given equation is
$(4 + m)x^2 + (m + 1)x + 1 = 0$
Here a = 4 + m, b = m + 1, c = 1
From equation (1)
$(m + 1)^2$ - 4(4 + m) × 1 = 0
$\Rightarrow m^2 + 2m + 1 - 16 - 4m = 0$
$\Rightarrow m^2 - 2m - 15 = 0$
$\Rightarrow m^2 - 5m + 3m - 15 = 0$
$\Rightarrow$ m(m - 5) + 3(m - 5) = 0
$\Rightarrow$ (m - 5) (m + 3) = 0
Either m - 5 = 0 or m + 3 = 0
m = 5 , -3

Sol.296.(d) $(a + b)^2 = a^2 + b^2 + 2ab$
Given that $(a + b)^2 = a^2 + b^2$
$a^2 + b^2 = a^2 + b^2 + 2ab \Rightarrow 2ab = 0$
$\Rightarrow$ a = 0 or b = 0
so (0, b) or (a , 0)
therefore, value of a and b can be infinite.
So, it may be true for infinite number of (a,b)

Sol.297.(a)
2x - (a - 4)y = 2b + 1, 4x - (a - 1)y = 5b - 1
If equation has infinite solution than we know that $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$
In this type of question we can solve it using option test
If we take the first option i.e. (a = 7 and b = 3) it satisfies the two equations
So a = 7 & b = 3.

Sol.298.(d) As α and β are the zeros of the polynomial $f(x) = kx^2 + 4x + 4$
$\Rightarrow \alpha + \beta = \frac{-4}{k}$, $\alpha\beta = \frac{4}{k}$
Given : $\alpha^2 + \beta^2 = 24$
$\Rightarrow (\alpha + \beta)^2 = \alpha^2 + \beta^2 + 2\alpha\beta$
$\Rightarrow 3k^2 + k - 2 = 0$
$\Rightarrow k = -1, \frac{2}{3}$
Then the positive value of k is $\frac{2}{3}$.

Sol.299.(b) The expression
(12.95 x 12.95 + 12.95 × x + 0.03 x 0.03) = $(12.95 + 0.03)^2$ will be a perfect square if $x = 2 \times 0.03 = 0.06$.

Sol.300.(b) $f(x) = x^2 - 8x + k$
Let α and β are the zeros of the given polynomial. Given that, $\alpha^2 + \beta^2 = 40$
We have,
$\alpha + \beta = 8$ And $\alpha\beta = k$
$(\alpha + \beta)^2 = \alpha^2 + \beta^2 + 2\alpha\beta$
$\Rightarrow$ 64 = 40 + 2k $\Rightarrow$ 24 = 2k
$\Rightarrow$ k = 12

Sol.301.(a) $\Rightarrow x^2 + 1 = 2x$
$\Rightarrow x + \frac{1}{x} = 2$ (both side divided by x)
Then find the value of
$x - \frac{1}{x} = 2^2 - 4 = 0$

Sol.302.(d) As we know when two quadratic equations have common root then the condition is :

$$\begin{vmatrix} a1 & c1 \\ a2 & c2 \end{vmatrix}^2 = \begin{vmatrix} a1 & b1 \\ a2 & b2 \end{vmatrix} \begin{vmatrix} b1 & c1 \\ b2 & c2 \end{vmatrix}$$

For the equation $x^2 + ax + b = 0$ and $x^2 + bx + a = 0$
a1 = a2 = 1, b1 = a, b2 = b, c1 = b, c2 = a ;
So from the above condition we get :
$(a - b)^2 = (b - a)(a^2 - b^2)$
[where a is not equal to b]
$\Rightarrow (a + b) = -1$

Sol.303.(d) Given that, $x = \sqrt{3} + \sqrt{2}$
Then, $\frac{1}{x} = \frac{1}{(\sqrt{3} + \sqrt{2})}$
$\frac{1}{x} = \sqrt{3} - \sqrt{2} \Rightarrow x + \frac{1}{x} = 2\sqrt{3}$
Now, $x^2 + \frac{1}{x^2} = (2\sqrt{3})^2 - 2$
= 12 - 2 $\Rightarrow$ 10

Sol.304.(a) $4x^4 + 9y^2 - 12x^2y = (2x^2 - 3y)^2$
Now, x = 5 and y = 2
$(2x^2 - 3y)^2 = (50 - 6)^2 = 1936$

Sol.305.(b)
The Value of $16x^4 + 25y^2 - 40x^2y$ at x = 5 and y = 2 is :
$= 4x^2(4x^2 - 10y) + 25y^2$
$= (4x^2 - 5y)^2 \Rightarrow (100 - 10)^2 = 8100$

Sol.306.(d)
$(x + 3)^3 = x^3 + 3^3 + 9x(x + 3)$
$= x^3 + 27 + 9x^2 + 27x$
Coefficient of x = 27

Sol.307.(a) $-3 \times \sqrt{196} + \sqrt{x} = 8 \times 3 - 2$
$\Rightarrow -3 \times 14 + \sqrt{x} = 24 - 2$
$\Rightarrow$ -42 + $\sqrt{x} = 22$
$\Rightarrow \sqrt{x} = 64 \quad \Rightarrow x = 4096$

Sol.308.(d) $\Rightarrow \frac{\sqrt{5} + \sqrt{2}}{\sqrt{5} - \sqrt{2}} = a + b\sqrt{10}$
$\Rightarrow \frac{\sqrt{5} + \sqrt{2}}{\sqrt{5} - \sqrt{2}} \times \frac{\sqrt{5} + \sqrt{2}}{\sqrt{5} + \sqrt{2}}$
$= a + b\sqrt{10} = \frac{7 + 2\sqrt{10}}{3}$, $a = \frac{7}{3}$, $b = \frac{2}{3}$

Sol.309.(a) Let a number = x
According to the question, the second number = 75 -x
$x^2 - (75 - x)^2 = 300$
$\Rightarrow x^2 - (5625 + x^2 - 150x) = 300$
$\Rightarrow 150x = 300 + 5625$
$\Rightarrow x = \frac{5925}{150} = 39.5$
second number= 75 - 39.5 = 35.5
difference between the two numbers= 39.5 - 35.5 = 4

Sol.310.(c) $\frac{x}{5} = \frac{y}{6} = \frac{z}{11}$
$\Rightarrow \frac{x}{y} = \frac{5}{6}$ and $\frac{y}{z} = \frac{6}{11}$
$x = 5, y = 6$ and $z = 11$
Now, $\frac{x + y + z}{z} = \frac{5 + 6 + 11}{11} = \frac{22}{11} \Rightarrow 2$

Sol.311.(b) $(1 - \frac{1}{x+1})(1 - \frac{1}{x+2})$
$(1 - \frac{1}{x+3})$ ... . $(1 - \frac{1}{2x})$

$= \frac{x}{x+1} \times \frac{x+1}{x+2} \times \frac{x+2}{x+3}$

$\times \ldots\ldots\ldots\ldots \times \frac{2x-1}{2x} = \frac{x}{2x} = \frac{1}{2}$

Sol.312.(b) $if\ a = x + y,\ b = x - y\ and\ c = 2x - 1$

Now

$\Rightarrow a^2 + b^2 + c^2 - 2ab + 2ac - 2bc$

$= (a - b + c)^2$ .....e.q .(1)

Putting the value of a , b and c in equation (1) ,

$(a - b + c)^2$

$\Rightarrow (x + y - x + y + 2x - 1)^2$

$= (2x + 2y - 1)^2$

Sol.313.(d) $\frac{\sqrt{7}+\sqrt{2}}{\sqrt{7}-\sqrt{2}} = x + y\sqrt{14}$

$\Rightarrow \frac{\sqrt{7}+\sqrt{2}}{\sqrt{7}-\sqrt{2}} \times \frac{\sqrt{7}+\sqrt{2}}{\sqrt{7}+\sqrt{2}} = x + y\sqrt{14}$

$\Rightarrow \frac{9+2\sqrt{14}}{5} = x + y\sqrt{14}$

$\Rightarrow \frac{9}{5} + \frac{2}{5}\sqrt{14} = x + y\sqrt{14}$

Where $x = \frac{9}{5}$, $y = \frac{2}{5}$

Sol.314.(c) $x = \frac{\sqrt{3}+1}{\sqrt{3}-1}$ and $y = \frac{\sqrt{3}-1}{\sqrt{3}+1}$

$x^2 + y^2 = \left(\frac{\sqrt{3}+1}{\sqrt{3}-1}\right)^2 + \left(\frac{\sqrt{3}-1}{\sqrt{3}+1}\right)^2$

$= \frac{4+2\sqrt{3}}{4-2\sqrt{3}} + \frac{4-2\sqrt{3}}{4+2\sqrt{3}}$

$= \frac{(4+2\sqrt{3})^2 + (4-2\sqrt{3})^2}{16-12}$

$x^2 + y^2 = \frac{2(16+12)}{4} = \frac{56}{4} = 14$

Sol.315.(d) $\frac{3\sqrt{2}-2\sqrt{3}}{3\sqrt{2}+2\sqrt{3}} = a + b\sqrt{6}$

$\Rightarrow \frac{(3\sqrt{2}-2\sqrt{3})^2}{(3\sqrt{2}+2\sqrt{3})(3\sqrt{2}-2\sqrt{3})} = a + b\sqrt{6}$

$\Rightarrow \frac{18+12-12\sqrt{6}}{18-12} = a + b\sqrt{6}$

$\Rightarrow \frac{30-12\sqrt{6}}{6} = a + b\sqrt{6}$

$\Rightarrow 5 - 2\sqrt{6} = a + b\sqrt{6}$

On comparing both sides we get, b = - 2

Sol.316.(d) Given that, x^2 = y + z,

y^2 = z + x and z^2 = x + y,

x^2 + x = x + y + z,

$\rightarrow$ x(x + 1) = x + y + z

$\rightarrow \frac{1}{x+1} = \frac{x}{(x+y+z)}$.....(i)

y^2 + y = z + x + y

y(y +1) = x + y + z

$\frac{1}{y+1} = \frac{y}{(x+y+z)}$..(ii)

z^2 + z = x + y + z

z(z + 1)= x + y + z

$\frac{1}{z+1} = \frac{z}{(x+y+z)}$ .....(iii)

From equation (i), (ii) and (iii)

$\frac{1}{x+1} + \frac{1}{y+1} + \frac{1}{z+1}$

$= \frac{x}{(x+y+z)} + \frac{y}{(x+y+z)} + \frac{z}{(x+y+z)}$

$= \frac{x+y+z}{(x+y+z)} = 1$

Sol.317.(d) $\frac{3\sqrt{5}-5}{3\sqrt{5}+5}$ = a + b$\sqrt{5}$

= $\frac{3\sqrt{5}-5}{3\sqrt{5}+5} \times \frac{3\sqrt{5}-5}{3\sqrt{5}-5}$ = a + b$\sqrt{5}$

= $\frac{45+25-30\sqrt{5}}{45-25}$ = a + b$\sqrt{5}$

= $\frac{70-30\sqrt{5}}{20}$ = a + b$\sqrt{5}$

= $\frac{70}{20} - \frac{30\sqrt{5}}{20}$ = a + b$\sqrt{5}$

= $\frac{7}{2} - \frac{3\sqrt{5}}{2}$ = a + b$\sqrt{5}$

So , b = - $\frac{3}{2}$

Sol.318.(c) $x^4 + \frac{1}{x^4} = 322$

$\Rightarrow x^2 + \frac{1}{x^2} = \sqrt{322 + 2} = 18$

$\Rightarrow x^2 + \frac{1}{x^2} = 18$

$\Rightarrow x - \frac{1}{x} = \sqrt{18 - 2} = 4$

$\Rightarrow x^3 - \frac{1}{x^3} = 4^3 + 3 \times 4 = 64 + 12 = 76$

Sol.319.(d) Let, $\sqrt{\frac{x}{144}} = \frac{27}{12}$ ---------(i)

Squaring both sides in equation (i)

$\Rightarrow \sqrt{\frac{x}{144}} = \frac{27}{12} \Rightarrow \frac{x}{144} = \frac{27 \times 27}{12 \times 12}$

$\Rightarrow x = 729$

Sol.320.(b)

$x + \frac{1}{x} = 5 \Rightarrow x^2 + 1 = 5x$

Now,

$\frac{3x}{2x^2 + 2 - 5x} = \frac{3x}{2(x^2+1) - 5x}$

= $\frac{3x}{10x - 5x} = \frac{3x}{5x} = \frac{3}{5}$

Sol.321.(b) $\frac{\sqrt{2401}}{x} = \frac{x}{6.25}$

$\Rightarrow \frac{49}{x} = \frac{x}{6.25}$

$\Rightarrow x^2 = 49 \times 6.25$

$\Rightarrow x = 7 \times 2.5 = 17.5$

Sol.322.(d) a + b + c = 0

Number of equation = 1

Number of variables = 3

The value of one variable will be fixed but the other two variables can be put anything.

Note:- Denominator should not be 0.

Let a = 1 and b = 1

From given equation, c = -2

Now, $\frac{(a^2+b^2+c^2)^2}{a^2b^2 + b^2c^2 + c^2a^2}$

= $\frac{(1^2 + 1^2 + (-2)^2)^2}{1^2 \times 1^2 + 1^2 \times (-2)^2 + (-2)^2 \times 1^2}$

= $\frac{(1+1+4)^2}{1+4+4} = \frac{6^2}{9} = \frac{36}{9} = 4$

Sol.323.(a) $\frac{2\sqrt{2}+\sqrt{7}}{2\sqrt{2}-\sqrt{7}} = x + y\sqrt{14}$

$\Rightarrow \frac{(2\sqrt{2}+\sqrt{7})^2}{(2\sqrt{2}-\sqrt{7})(2\sqrt{2}+\sqrt{7})} = x + y\sqrt{14}$

$\Rightarrow \frac{8+7+4\sqrt{14}}{8-7} \Rightarrow = x + y\sqrt{14}$

$\Rightarrow 15 + 4\sqrt{14} = x + y\sqrt{14}$

On comparing, we get y = 4

Sol.324.(b) $a^{\frac{1}{3}} = 6$

$a = 6^3 = 216 \Rightarrow a^2 - 36a = 46656 - 36 \times 216$

= 46656 -7776 = 38880

Sol.325.(d) $x = 7 + 4\sqrt{3}$

$\frac{1}{x} = 7 - 4\sqrt{3} \rightarrow x + \frac{1}{x} = 14$

So, $\sqrt{x} + \frac{1}{\sqrt{x}} = \sqrt{14 + 2} = 4$

Sol.326.(b) $\sqrt{\frac{x}{1-x}} + \sqrt{\frac{1-x}{x}} = \frac{25}{12}$

$\Rightarrow \frac{x + (1-x)}{\sqrt{(1-x)x}} = \frac{25}{12}$

$\Rightarrow \frac{1}{x(1-x)} = \frac{625}{144}$

$\Rightarrow 144 = 625x - 625x^2$

$\Rightarrow 625x^2 - 625x + 144 = 0$

$\Rightarrow 625x^2 - 400x - 225x + 144 = 0$

$\Rightarrow 25x(25x - 16) - 9(25x - 16) = 0$

$\Rightarrow (25x - 16)(25x - 9) = 0$

$x = \frac{16}{25}\ or\ \frac{9}{25}$

Sol.327.(b) $\frac{x^2}{yz} + \frac{y^2}{zx} + \frac{z^2}{xy}$

= $\frac{x^3 + y^3 + z^3}{xyz} = \frac{3xyz}{xyz} = 3$

Sol.328.(d)

$(1 + \frac{1}{x})(1 + \frac{1}{x+1})(1 + \frac{1}{x+2})$

$(1 + \frac{1}{x+3})$

$= \left(\frac{x+1}{x}\right)\left(\frac{x+2}{x+1}\right)\left(\frac{x+3}{x+2}\right)\left(\frac{x+4}{x+3}\right) = \frac{x+4}{x}$

Sol.329.(b) If a + b + c = 0

Then $a^3 + b^3 + c^3 = 3abc$

Sol.330.(d) $2^{x+y} = 16 \Rightarrow 2^{x+y} = 2^4$
x + y = 4 _____ (1)
And, $64^{x-y} = 2 \Rightarrow 2^{6(x-y)} = 2$
6 (x - y) = 1 _____ (2)
On solving equation (1) and (2), we get
X = $\frac{25}{12}$ and y = $\frac{23}{12}$ Unique solution.

Sol.331.(b) Square root of $(x^2 - 14x + 49)(x^2 + 6x + 9)$
$= (x - 7)(x + 3)$

Sol.332.(b) Given - x=12 and y=7
Now $(\frac{x^2+y^2-xy}{x^3+y^3})$
$= (\frac{x^2+y^2-xy}{(x+y)(x^2+y^2-xy)})$
$= (\frac{1}{(x+y)}) = (\frac{1}{(12+7)}) = \frac{1}{19}$

Sol.333.(d) Given ,
11= $\frac{11x}{1-x}$ $\Rightarrow$ 11 (1 - x) = 11x
$\Rightarrow$ 11 - 11x = 11x $\Rightarrow$ 22x= 11
$\Rightarrow$ x = $\frac{11}{22}$ $\Rightarrow$ $\frac{1}{2}$
Putting the value of x in $(2x)^2$ then we get $(2x)^2$ = 1

Sol.334.(b) x^2 - x - 20 = 0
x^2 - 5x + 4x - 20 = 0
x(x - 5)+ 4 (x -5) = 0
(x + 4) (x - 5) = 0
So, (x - 5) is a factor of the polynomial.

Sol.335.(d) $\frac{x}{\sqrt{128}} = \frac{\sqrt{162}}{x}$
$x \times x = \sqrt{128} \times \sqrt{162} \Rightarrow$ x = 12

Sol.336.(a) Let , the numbers are = x and y
A/Q , x + y = 27 and $x^2 - y^2$ = 243
We know that - (x + y) (x - y) = $x^2 - y^2$
So that , 27 (x - y) = 243
(x - y) = 9
Hence , The difference between the numbers = 9

Sol.337.(b) $\frac{4}{5} + (-\frac{3}{10}) = x + 1\frac{1}{2}$
$\frac{4}{5} - \frac{3}{10} = x + \frac{3}{2}$ $\Rightarrow$x = - 1

Sol.338.(b) Let , the numbers are = x and y
A/Q , Sum of two number
= x + Y = 30 -----(i)
sum of their reciprocals
= $\frac{1}{X} + \frac{1}{Y} = \frac{6}{25} \Rightarrow$ xy = 5 × 25 -----(ii)
From equation (i) and (ii) we get two numbers are = 5 and 25

Sol.339.(a) Let the numbers be a and b
A/Q, a + b = 20
And ab= 96
$(a - b)^2 = (a + b)^2 - 4ab$
= $20^2 - 4 \times 96$= 400 - 384 = 16
$a - b = 4$

Sol.340.(c) $\sqrt{1 + \frac{x}{144}} = \frac{13}{12}$.
$= \sqrt{\frac{144+x}{144}} = \frac{13}{12} \Rightarrow x = 25$

Sol.341.(c) $x \times y = x + y + \sqrt{xy}$
6 × 24 = 6 + 24 +
$\sqrt{6 \times 24} = 30 + 12 = 42$

Sol.342.(a) x^2 - 7x + 12= 0
$\Rightarrow x^2 - 4x - 3x + 12 = 0$
$\Rightarrow x(x - 4) - 3(x - 4)$
$\Rightarrow (x - 4)(x - 3)$
$\Rightarrow x = 4 \ or \ x = 3$

Sol.343.(a) $(\frac{1}{5}x - \frac{1}{6}y)$ (5x+6y)
$= (\frac{5}{5}x^2 + \frac{6xy}{5} - \frac{5xy}{6} - \frac{6}{6}y^2)$
$= x^2 + \frac{11xy}{30} - y^2$

Sol.344.(a) a + b + c = 8
b and c are greater than 0. For maximum value of a take b and c is equal to 1
a = 8 - 2 = 6

Sol.345.(a) 1.5 x = 0.04y $\Rightarrow \frac{X}{Y} = \frac{4}{150}$
$\frac{y-x}{y+x} = \frac{150-4}{150+4} = \frac{146}{154} = \frac{73}{77}$

Sol.346.(d) a : b : c = 4 : 3 : 2
Let a = 4k, b = 3k, c = 2k
4k + 3k + 2k = 27$\sqrt{29}$
K = 3$\sqrt{29}$
a =12$\sqrt{29}$, b = 9$\sqrt{29}$, c = 6$\sqrt{29}$
$\sqrt{a^2 + b^2 + c^2}$
$= \sqrt{(12\sqrt{29})^2 + (9\sqrt{29})^2 + (6\sqrt{29})^2}$
$= \sqrt{29 \times (144 + 81 + 36)}$
$= \sqrt{29 \times 9 \times 29}$
= 87

Sol.347.(b)
$(2a^3 - 3)(5a^3 - 2)$= 10 a^6 + ? + 6
10a^6 - 4 a^3-15a^3+6 =10 a^6 + ? + 6
? = -19a^3

Sol.348.(c) $\frac{144}{0.144} = \frac{14.4}{x}$
$\Rightarrow x = \frac{14.4 \times 0.144}{144} = 0.0144$

Sol.349.(a) $\frac{x}{y} = \frac{6}{5}$
Now,
$\frac{x^2 + y^2}{x^2 - y^2} = \frac{36 + 25}{36 - 25} = \frac{61}{11}$

Sol.350.(a)
x = $\frac{\sqrt{3}+1}{\sqrt{3}-1}$ and y = $\frac{\sqrt{3}-1}{\sqrt{3}+1}$
$\Rightarrow (x + y)^2 = x^2 + y^2 + 2xy$
$\Rightarrow x^2 + y^2 = (x + y)^2$- 2xy
$\Rightarrow x^2 + y^2 = (\frac{\sqrt{3}+1}{\sqrt{3}-1} + \frac{\sqrt{3}-1}{\sqrt{3}+1})^2 - 2$
$\times \frac{\sqrt{3}+1}{\sqrt{3}-1} \times \frac{\sqrt{3}-1}{\sqrt{3}+1}$
$= (\frac{3+1+2\sqrt{3}+3+1-2\sqrt{3}}{3-1})^2 - 2$
$= (\frac{8}{2})^2 - 2 = 4^2$ - 2 = 16 - 2 = 14

Sol.351.(b) $y\sqrt{y^3 - y^2}$
$= y\sqrt{y^2(y-1)} \Rightarrow y^2\sqrt{(y-1)}$
Put y = 26
$= 26^2(\sqrt{26-1}) = 676 \times 5 = 3380$

Sol.352.(b) $2\frac{1}{2} + 3\frac{1}{2} + 4\frac{1}{2}$ = x
X = $\frac{5}{2} + \frac{7}{2} + \frac{9}{2} = \frac{21}{2}$
A/Q , x - $5\frac{1}{2} = \frac{21}{2} - \frac{11}{2} = \frac{10}{2}$ = 5

Sol.353.(b) $\frac{x-y}{3} = \frac{x+y}{5} = \frac{xy}{8}$
$\Rightarrow 5x - 5y = 3x + 3y \Rightarrow 2x = 8y$
$\Rightarrow x = 4y$_____(1)
Now take last 2 pairs of given ratio
8x + 8y=5xy
32y + 8y = 5xy {from equation (1)}
40y = 5xy $\Rightarrow$ X = 8
From (1) y = 2
xy = 16

Sol.354.(d) $\sqrt{x} + \frac{2}{5} \times 70 = 20 \times \frac{1}{4} \times 7$
$\Rightarrow \sqrt{x} + 28 = 35 \Rightarrow \sqrt{x} = 7 \Rightarrow x = 49$

Sol.355.(d) Let the numbers are x and y
A/Q, x + y = 20 —-------(i)
And $x^2 - y^2 = 80$ —--------(ii)
Put x = 20 - y in equation (ii)
$(20 - y)^2 - y^2 = 80$
$\Rightarrow$ 400 + y^2- 40y - y^2= 80
$\Rightarrow 40y = 320 \Rightarrow y = 8$
And x = 20 - 8 = 12

Sol.356.(a) $x^2 - 1$ is a factor of
$(ax^4 + bx^3 + cx^2 + dx + e)$
So, we will put value of $x = \pm 1$
So, we get $ax^4 + bx^3 + cx^2 + dx + e = 0$
$a(\pm 1)^4 + b(\pm 1)^3 + c(\pm 1)^2 + d(\pm 1) + e = 0$
On solving, possible relation we get,

a + b + e = b + d

Sol.357.(c) $x + \frac{1}{x} = \sqrt{29}$,

we know that , $x + \frac{1}{x} = K$

then $x - \frac{1}{x} = \sqrt{K^2 - 4}$

Now , $x - \frac{1}{x} = \sqrt{29 - 4} = 5$

Sol.358.(c) $\frac{x+y}{x-y} = \frac{7}{3}$

x + y = 7 -----(i) ⇒ X + y = 3 -----(ii)

From equation (i) & (ii)

X = 5 , y = 2

Now , $(x^2 + y^2) : (x^2 - y^2) = 29 : 21$

Sol.359.(a) 2x - 3y = 7 -----(i)

$\frac{x}{x+y} = \frac{5}{6} \Rightarrow 6x = 5x + 5y \Rightarrow x = 5y$ -----(ii)

From equation (i) and (ii)

2 × 5y - 3y = 7

10 y - 3y = 7 ⇒ y = 1 And x = 5

Now , x - y = 5 -1 = 4

Sol.360.(a)

a = $\frac{3+\sqrt{5}}{3-\sqrt{5}}$ and b = $\frac{3-\sqrt{5}}{3+\sqrt{5}}$

Putting the value a and b in $a^2 + b^2$-ab

Then , $\left[\frac{3+\sqrt{5}}{3-\sqrt{5}}\right]^2 + \left[\frac{3-\sqrt{5}}{3+\sqrt{5}}\right]^2 - \frac{3+\sqrt{5}}{3-\sqrt{5}} \times \frac{3-\sqrt{5}}{3+\sqrt{5}}$ = 46

Sol.361.(a)

$\frac{3+\sqrt{5}}{3-\sqrt{5}} + \frac{3-\sqrt{5}}{3+\sqrt{5}} + \frac{\sqrt{5}-1}{\sqrt{5}+1}$

=

$\frac{(3+\sqrt{5})(3+\sqrt{5}) + (3-\sqrt{5})(3-\sqrt{5})}{(3-\sqrt{5})(3+\sqrt{5})}$

$+ \frac{\sqrt{5}-1}{\sqrt{5}+1}$

$= 7 + \frac{(6-2\sqrt{5})}{4} \Rightarrow \frac{17-\sqrt{5}}{2}$

Sol.362.(b) $a^2 + b^2 + c^2 + 3$

$= 2(a + b + c)$

$\Rightarrow (a^2 - 2a + 1) + (b^2 - 2b + 1)$

$+ (c^2 - 2c + 1) = 0$

$\Rightarrow (a-1)^2 + (b-1)^2 + (c-1)^2 = 0$

So, $a = 1,\ b = 1\ and\ c = 1$

Now,

$a + b + c = 1 + 1 + 1 = 3$

Sol.363.(d)

$x^3 - 9x^2 - 26x - 24$ Put x = 1

1 - 9 - 26 - 24 ⇒1 - 59 = - 58 ≠ 0

Sol.364.(b) x² - 3x + 1=0

Dividing by x

$x + \frac{1}{x} = 3 \Rightarrow x^2 + \frac{1}{x^2} = 3^2 - 2 = 7$

Now,

X² + x + $(\frac{1}{x}) + (\frac{1}{x^2})$

$= x + \frac{1}{x} + x^2 + \frac{1}{x^2} = 3 + 7 = 10$

Sol.365.(c) x = $\frac{\sqrt{5}+1}{\sqrt{5}-1}$ and y = $\frac{1}{x}$

x + y = $\frac{\sqrt{5}+1}{\sqrt{5}-1} + \frac{\sqrt{5}-1}{\sqrt{5}+1}$

$= \frac{5 + 1 + 2\sqrt{5} + 5 + 1 - 2\sqrt{5}}{5-1} = \frac{12}{4} = 3$

x² +y² = $3^2 - 2 = 7$

Sol.366.(b)

a=0.1 + $\sqrt{0.9}$ and b=0.1 - $\sqrt{0.9}$

$a^2 + b^2 = (a + b)^2 - 2ab$

$=(0.1 + \sqrt{0.9} + 0.1 - \sqrt{0.9})^2 - 2[$

$0.1^2 - 0.9] = 0.2^2 - 2 \times (0.01 - 0.9)$

= 0.04 + 1.78 = 1.82

Sol.367.(d) $\sqrt{1+x} = \sqrt{1 + \frac{\sqrt{3}}{2}}$

$= \sqrt{\frac{2+\sqrt{3}}{2}} = \sqrt{\frac{4+2\sqrt{3}}{4}} = \frac{\sqrt{3}+1}{2}$

$\sqrt{1-x} = \frac{\sqrt{3}-1}{2}$

Now,

$\frac{\sqrt{3}+1}{2} + \frac{\sqrt{3}-1}{2} = \frac{2\sqrt{3}}{2} = \sqrt{3}$

Sol.368.(d) $\frac{1}{a} + \frac{1}{b} + \frac{1}{c} = 1$

$\Rightarrow \frac{bc + ac + ab}{abc} = 1$

$\Rightarrow ab + bc + ca = abc$

$(a + b + c)^2 = a^2 + b^2 + c^2 + 2$

(ab + bc + ca)

$\Rightarrow 3^2 = 6 + 2abc \Rightarrow 2abc = 3$

$\Rightarrow abc = \frac{3}{2}$

Sol.369.(b) Given , a = 2b = 3c

The ratio between a , b and c = 6x : 3x: 2x

And a + b + c = 121 ------(i)

Putting the value of a , b and c in equation (i)

6x + 3x + 2x = 121

11x = 121 ⇒ x = 11

Now , a = 66 , b = 33 , c = 22

$\sqrt{a^2 + b^2 + c^2}$

$= \sqrt{66^2 + 33^2 + 22^2} = 77$

Sol.370.(c) Given , x + y + z = 0

$\frac{x^2}{yz} + \frac{y^2}{zx} + \frac{z^2}{xy} = \frac{x^3 + y^3 + z^3}{xyz}$

$= \frac{3xyz}{xyz} = 3$

Sol.371.(a)

$(1 + x)(1 - x)(1 + x^2)(1 + x^4)(1 + x^8)$

$= (1 - x^2)(1 + x^2)(1 + x^4)(1 + x^8)$

$= (1 - x^4)(1 + x^4)(1 + x^8)$

$= (1 - x^8)(1 + x^8) = (1 - x^{16})$

Sol.372.(c) a = $\frac{b^2}{(b-a)}$

$\Rightarrow a(b - a) = b^2 \quad \Rightarrow ab = a^2 + b^2$

Now,

$a^3 + b^3 = (a + b)(a^2 + b^2 - ab)$

$= (a + b)(a^2 + b^2 - a^2 - b^2) = 0$

Sol.373.(a) 3x + y = 5 .....(1)

4x - 3y = 2 .....(2)

On solving both of the equation

we get, x = $\frac{17}{13}$, and y = $\frac{14}{13}$

Now , x : y = 17 : 14.

Sol.374.(b) Putting x = -1,

y = $\frac{1}{2}$, z = 2 .

Equation satisfied, so xyz = -1

Sol.375.(a)

Given , ab = 10 and a² + b² = 29

We know that

, $(a - b)^2 = a^2 + b^2 - 2ab$ ----(i)

Putting the given value in equation (i)

(a - b)² = 29 - 2 × 10 ⇒ (a - b)² = 9

Sol.376.(c) $(\sqrt{5}+1)^2 = a + b\sqrt{5}$

$5 + 1 + 2\sqrt{5} = a + b\sqrt{5}$

$6 + 2\sqrt{5} = a + b\sqrt{5}$

Only possible condition a = 6 , b = 2 where (a>b)

Sol.377.(b) 2x - 3y = -1

$\Rightarrow 2x = 3y - 1$

$\Rightarrow x = \frac{3y-1}{2}$ ____ (1)

Now,

$\frac{x}{x+y} = \frac{7}{12} \Rightarrow 12x = 7x + 7y$

$\Rightarrow 5x = 7y$

Putting the value of x from equation (1)

$\Rightarrow 5(\frac{3y-1}{2}) = 7y$

$\Rightarrow 15y - 5 = 14y \Rightarrow y = 5$

From (1), x =7 ⇒2xy = 2 × 7 × 5 = 70

Sol.378.(a) 4x² + 4xy + y² = $(2x + y)^2$

$= (2 \times 3 + 5)^2 = 11^2 = 121$

Sol.379.(a) $(x + y)^2 = x^2 + y^2 + 2xy$

$\Rightarrow (x + y)^2 = 41 + 2 \times 20 = 81$

$\Rightarrow x + y = 9$

Now, $\frac{1}{x} + \frac{1}{y} = \frac{x+y}{xy} = \frac{9}{20}$

Sol.380.(b) (x + 1) and (x + 2) are factors of $ax^3 + 3x^2 + bx$
So that , x = -1 and x = -2
When we put x = -1
a + b = 3.....(i)
When we put x = -2
-8a - 2b = -12
4a + b = 6.....(ii)
From both the equations,
a = 1 and b = 2

Sol.381.(d) Given,
a - b = 4 and $a^2 + b^2 = 10$
$(a - b)^2 = a^2 + b^2 - 2ab \Rightarrow 16 = 10 - 2ab$
ab = -3
We know that ,

$(a - b)^3 = a^3 - b^3 - 3ab(a - b)$

$64 = a^3 - b^3 - 3(-3) \times 4$
$a^3 - b^3 = 64 - 36 = 28$

Sol.382.(d) 2a = 3b = 4c
a : b : c = 12 : 8 : 6 = 6 : 4 : 3
$6x + 4x + 3x = 13\sqrt{2}$
$13x = 13\sqrt{2} \Rightarrow x = \sqrt{2}$
So, $a = 6\sqrt{2}$, $b = 4\sqrt{2}$ $c = 3\sqrt{2}$
$a^2 + b^2 + c^2 = 72 + 32 + 18 = 122$

Sol.383.(c) $x^4 + \frac{1}{x^4} = 322$

$\Rightarrow x^2 + \frac{1}{x^2} = \sqrt{322 + 2} = \sqrt{324} = 18$

$\Rightarrow x - \frac{1}{x} = \sqrt{18 - 2} = \sqrt{16} = 4$

Sol.384. (d)

$= (1 + \frac{1}{x+1})(1 + \frac{1}{x+2})(1 + \frac{1}{x+3})(1 + \frac{1}{x+4})$

$= (\frac{x+1+1}{x+1})(\frac{x+2+1}{x+2})(\frac{x+3+1}{x+3})(\frac{x+4+1}{x+4})$

$= (\frac{x+2}{x+1})(\frac{x+3}{x+2})(\frac{x+4}{x+3})(\frac{x+5}{x+4})$

$= \frac{(x+2)(x+3)(x+4)(x+5)}{(x+1)(x+2)(x+3)(x+4)} = \frac{x+5}{x+1}$

Sol.385.(c) $(a + b + c)^2$
$= a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$
$(6)^2 = 2 + 2(ab + bc + ca)$
36 - 2 = $2(ab + bc + ca)$
$(ab + bc + ca) = \frac{34}{2} = 17$

Sol.386.(a) $(\sqrt{2} + 1)^3 = a + b\sqrt{2}$
$(\sqrt{2})^3 + 1^3 + 3 \times (\sqrt{2})^2 \times 1 + 3 \times (\sqrt{2}) \times 1$
$= a + b\sqrt{2}$
$2\sqrt{2} + 1 + 3 \times 2 + 3\sqrt{2} = a + b\sqrt{2}$
$5\sqrt{2} + 7 = a + b\sqrt{2}$
$7 + 5\sqrt{2} = a + b\sqrt{2}$
Where , a = 7 and b = 5
Hence , we can say that , a - b = 2

Sol.387.(a) $2^x = 4^{y+1} \Rightarrow x = 2y + 2$
$3^y = 3^{x-9} \Rightarrow y = x - 9$
Then solving these two equations we get
x = 16, y = 7 ;

Sol.388.(c) $x^2 + 25y^2 = 10xy$
$x^2 + 25y^2 - 10xy = 0$
$(x - 5y)^2 = 0 \Rightarrow X = 5y$
$\frac{X}{Y} = \frac{5}{1}$

Sol.389.(d) Given , x + y = 9 and xy = 18
We know that ,
$(x + y)^2 = x^2 + y^2 + 2xy$-----(i)
Putting the given values in equation (i)
$9^2 = x^2 + y^2 + 2 \times 18$
$81 = x^2 + y^2 + 36$
$x^2 + y^2 = 45$

Sol.390.(b) Given , $x = 2 + \sqrt{5}$
$(x - \frac{1}{x})^3 = (\frac{x^2 - 1}{x})^3$

$= (\frac{9 + 4\sqrt{5} - 1}{2 + \sqrt{5}})^3 = (\frac{8 + 4\sqrt{5}}{2 + \sqrt{5}})^3 = 64$

Sol.391.(a) $4x^2 - 8x + 3 = 0$
$\Rightarrow 4x^2 - 6x - 2x + 3 = 0$
$\Rightarrow 2x(2x - 3) - 1(2x - 3) = 0$
$\Rightarrow (2x - 3)(2x - 1) = 0$
Either 2x - 3 = 0 or 2x - 1 = 0
$x = \frac{3}{2} = 1.5 \; or \; x = \frac{1}{2} = 0.5$

Sol.392.(b) $\frac{a^2 - 1}{a} = 5, \Rightarrow a - \frac{1}{a} = 5$

$\frac{a^6 - 1}{a^3} = a^3 - \frac{1}{a^3} = (5)^3 + 3 \times 5 = 140$

Sol.393.(d) $2^x = 4^{y+1}$ and $3^y = 3^{x-9}$,
$2^x = 2^{2y+2}$
On comparing
$x = 2y + 2$ _(1) $\Rightarrow x - 9 = y$
$x = y + 9$ _(2)
From (1) and (2) we get
$2y + 2 = y + 9 \Rightarrow y = 7$
From (2) $\Rightarrow x = 16$

Sol.394.(d) 3 (5x + 2) - 4 = 2 (1 - 4x)
15x + 6 - 4 = 2 - 8x
15x + 2 = 2 - 8x
15x + 8x = 0 $\Rightarrow$ 23x = 0 $\Rightarrow$ X = 0

Sol.395.(d)
$(x - y)^3 = x^3 - y^3 - 3xy(x - y)$
$\Rightarrow 1 = x^3 - y^3 - 3xy \times 1$
$\Rightarrow x^3 - y^3 - 3xy = 1$

Sol.396.(a)

$\frac{1 - x^4}{1 + x} \div \frac{1 + x^2}{x} \times \frac{1}{x(x-1)}$

$\Rightarrow \frac{(1 - x^2)(1 + x^2)}{(1 + x)} \times \frac{x}{(1 + x^2)}$

$\times \frac{1}{x(x-1)} = \frac{(1 - x)(1 + x)}{(1 + x)(x - 1)} = -1$

Sol.397. (a) $x = \frac{\sqrt{3} + 1}{\sqrt{3} - 1}$ and $y = \frac{\sqrt{3} - 1}{\sqrt{3} + 1}$

$y = \frac{1}{x} \Rightarrow x + \frac{1}{x} = \frac{\sqrt{3}+1}{\sqrt{3}-1} + \frac{\sqrt{3}-1}{\sqrt{3}+1}$

$= \frac{3 + 1 + 2\sqrt{3} + 3 + 1 - 2\sqrt{3}}{3 - 1} = \frac{8}{2} = 4$

$x^2 + y^2 = x^2 + \frac{1}{x^2} = 16 - 2 = 14$

Sol.398.(a) Given
,$x = \frac{\sqrt{3}+1}{\sqrt{3}-1}$, $y = \frac{\sqrt{3}-1}{\sqrt{3}+1}$
Now putting the value of x and y in 3(x+y)

$= 3\{(\frac{\sqrt{3}+1}{\sqrt{3}-1}) + (\frac{\sqrt{3}-1}{\sqrt{3}+1})\}$

$= 3 \times (\frac{(\sqrt{3}+1)(\sqrt{3}+1) + (\sqrt{3}-1)(\sqrt{3}-1)}{(\sqrt{3}-1)(\sqrt{3}+1)})$

$= 3 \times (\frac{3 + 1 + 2\sqrt{3} + 3 + 1 - 2\sqrt{3}}{2}) = 12$

Sol.399. (a) Given , a - 5 = b ,
a - b = 5 , $\Rightarrow$ b - a = - 5
$|a - b| + |b - a|$
= | 5 | + |− 5| = 5 + 5 $\Rightarrow$ = 10

Sol.400. (b)
5Y6 + 6X7 + 3Z8 = 1511 ----- (i)
Let , Y = 0 , Z = 0 and X = 9 (single digit maximum value)
Putting the value of X , Y and Y
506 + 697 + 308 = 1511
1511 = 1511
(LHS = RHS)
Hence , X = 9

Sol.401.(a)

$\sqrt{x^2 - 2xy + y^2} = \sqrt{(x - y)^2} = x - y = 12$

Sol.402.(d) $a^{2x} = b, \; b^{2y} = c, \; c^{2z} = a$
Number of repetition of a, b and c is equal number of times
So we can put a = b = c
$a^{2x} = b$ = a $\Rightarrow$ 2x = 1 $\Rightarrow x = \frac{1}{2}$
Similarly , $y = \frac{1}{2}$ and $z = \frac{1}{2}$
$xyz = \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{8}$

Sol.403.(d) $99^3 = 99 \times 99 \times 99 = 970299$

Sol.404.(c) 2x + 3y = 23
$\Rightarrow 2 \times 4 + 3y = 23 \Rightarrow 8 + 3y = 23$
$\Rightarrow 3y = 15 \Rightarrow y = 5$

Sol.405.(d)
$$\frac{(p-q)^3 + (q-r)^3 + (r-p)^3}{9(p-q)(q-r)(r-p)}$$
We, know that, If a + b + c = 0 then
$a^3 + b^3 + c^3 = 3abc$
$$= \frac{3(p-q)(q-r)(r-p)}{9(p-q)(q-r)(r-p)} = \frac{1}{3}$$

Sol.406.(c) $a^4 + b^4 = 17$ and $a + b = 1$
Put a = 2 and b = -1
The value of a and b satisfies the given equations
Now, $a^2b^2 - 2ab$
$= 2^2 \times (-1)^2 - 2 \times 2 \times (-1)$
$= 4 \times 1 + 4 = 4 + 4 = 8$

Sol.407.(c) $\frac{(a^2-b^2)}{(a^2-ab)} = \frac{(a^3+b^3)}{?}$
$$\frac{(a+b)}{a} = \frac{(a+b)(a^2+b^2-ab)}{?}$$
$? = a(a^2 + b^2 - ab)$

Sol.408.(b) $x + y$
$$= \frac{\sqrt{2}+\sqrt{3}}{\sqrt{2}-\sqrt{3}} + \frac{\sqrt{2}-\sqrt{3}}{\sqrt{2}+\sqrt{3}}$$
$$= \frac{5 + 2\sqrt{6} + 5 - 2\sqrt{6}}{-1} = -10$$
Now,
$(x + y)^2 = (-10)^2 = 100$

Sol.409.(c)
$(x^3 + 4x^2 + 6x - 2) \div (x + 5)$
x + 5 = 0 = x = -5
Put the value of x,
$(x^3 + 4x^2 + 6x - 2)$ = -125 + 100 - 30 - 2 = -57 Hence, remainder = - 57

Sol.410.(b) $x - \frac{1}{x} = \sqrt{21}$
$$\left(x - \frac{1}{x}\right)^2 = 21 \Rightarrow \left(x^2 + \frac{1}{x^2}\right) = 23$$
$$x^2 + \frac{1}{x^2} + 2 = 25 \Rightarrow x + \frac{1}{x} = 5$$
$$\left(x^2 + \frac{1}{x^2}\right)\left(x + \frac{1}{x}\right) = 23 \times 5 = 115$$

Sol.411.(c) $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} = a + b\sqrt{15}$
$$\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} \times \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}+\sqrt{3}} = a + b\sqrt{15}$$
$$\frac{5 + 2\sqrt{15} + 3}{5 - 3} = a + b\sqrt{15}$$
$$\frac{8 + 2\sqrt{15}}{2} = a + b\sqrt{15}$$
$4 + \sqrt{15} = a + b\sqrt{15} \Rightarrow a = 4$

Sol.412.(a) $x^3 + y^3 + z^3 - 3xyz$
$= (x + y + z)[(x + y + z)^2$
$- 3(xy + yz + zx)$
$\Rightarrow x^3 + y^3 + z^3 - 3xyz$
$= 16 \times (16^2 - 3 \times 78)$
$= 16 \times (256 - 234) = 16 \times 22 = 352$

Sol.413.(c) x + y = 1
$(x + y)^3 = x^3 + y^3 + 3xy(x + y)$
$\Rightarrow 1^3 = x^3 + y^3 + 3xy \times 1$
$x^3 + y^3 + 3xy = 1$

Sol.414.(d) (a + 1)(1 - a)(1- a + a^2)(1 + a + a^2)(1 + a^6)
$(1 - a^2)(1 + a^4 + 2a^2 - a^2)(1 + a^6)$
$(1 - a^2)(1 + a^4 + a^2)(1 + a^6)$
$(1 - a^6)(1 + a^6) \rightarrow 1 - a^{12}$

Sol.415. (d) x = a(b - c), y = b(c - a) and z = c(a - b)
$\frac{x}{a} = b - c, \frac{y}{b} = c - a, \frac{x}{c} = a - b$
$\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 0$
$\left(\frac{x}{a}\right)^3 + \left(\frac{y}{b}\right)^3 + \left(\frac{z}{c}\right)^3 = \frac{3xyz}{abc}$

Sol.416.(a)
$x^2 = y + z, y^2 = z + x, z^2 = x + y$
Put x = y = z = 2
$$\frac{1}{x+1} + \frac{1}{y+1} + \frac{1}{z+1}$$
$$= \frac{1}{2+1} + \frac{1}{2+1} + \frac{1}{2+1} = 1$$

Sol.417.(b) $\Rightarrow \frac{\alpha^2}{\beta\gamma} + \frac{\beta^2}{\gamma\alpha} + \frac{\gamma^2}{\alpha\beta}$
Here LCM is $\alpha\beta\gamma$
$$\Rightarrow \frac{\alpha^2}{\beta\gamma} + \frac{\beta^2}{\gamma\alpha} + \frac{\gamma^2}{\alpha\beta} = \frac{\alpha^3 + \beta^3 + \gamma^3}{\alpha\beta\gamma}$$
Since, $\alpha + \beta + \gamma = 0$
So, $\alpha^3 + \beta^3 + \gamma^3 = 3\alpha\beta\gamma$
Now, $\frac{\alpha^3 + \beta^3 + \gamma^3}{\alpha\beta\gamma} = \frac{3\alpha\beta\gamma}{\alpha\beta\gamma} = 3$
Short Trick:
Given , $\alpha + \beta + \gamma = 0$
Let , $\alpha = -2, \beta = \gamma = 1$
- 2 + 1 + 1 = 0 (satisfy)
now , $\frac{\alpha^2}{\beta\gamma} + \frac{\beta^2}{\gamma\alpha} + \frac{\gamma^2}{\alpha\beta}$
$$= \frac{(-2)^2}{1} + \frac{1^2}{-2} + \frac{1^2}{-2} = 3$$

Sol.418.(c) Given , x = 2 + $\sqrt{2}$
Putting the value of x in $x^2 - 4x + 4$
$= (2 + \sqrt{2})^2 - 4(2 + \sqrt{2}) + 4$
$= 4 + 2 + 4\sqrt{2} - 8 - 4\sqrt{2} + 4 = 2$

Sol.419.(b) a = -5 and b = 5
$a^2 - b^2 = (-5)^2 - 5^2 = 25 - 25 = 0$

Sol.420.(c) 2x + y - 3 = 0
$\Rightarrow 2x + y = 3$
Now,
$(2x + y)^3 = 8x^3 + y^3 + 6xy(2x + y)$
$\Rightarrow 3^3 = 8x^3 + y^3 + 6xy \times 3$
$\Rightarrow 27 = 8x^3 + y^3 + 18xy$
$8x^3 + y^3 + 18xy - 27 = 0$

Sol.421.(d) $\frac{7 + 2\sqrt{5}}{11 + 3\sqrt{5}} = a + b\sqrt{5}$
$$\Rightarrow \frac{7 + 2\sqrt{5}}{11 + 3\sqrt{5}} \times \frac{11 - 3\sqrt{5}}{11 - 3\sqrt{5}} = a + b\sqrt{5}$$
$$\Rightarrow \frac{77 - 21\sqrt{5} + 22\sqrt{5} - 30}{121 - 45} = a + b\sqrt{5}$$
$$\Rightarrow \frac{47 + \sqrt{5}}{76} = a + b\sqrt{5}$$
On comparing we get
a = $\frac{47}{76}$ and b = $\frac{1}{76}$

Sol.422.(b) Let the roots be 2p and 3p
So, sum of roots = 5p = $\frac{-m}{12}$ ....(1)
Product of roots = $6p^2 = \frac{1}{2} \Rightarrow P^2 = \frac{1}{12}$
so, $p = \pm\frac{1}{\sqrt{12}}$
Putting the negative value of p in equation (1)
$m = -60p = -60 \times \frac{-1}{\sqrt{12}} = 5\sqrt{12} = 10\sqrt{3}$

Sol.423.(c) x = 3 + $\sqrt{5}$ and y = 3 - $\sqrt{5}$
$x^2 = 9 + 5 + 6\sqrt{5}$
$y^2 = 9 + 5 - 6\sqrt{5}$
$x^2 + y^2 = 14 + 14 = 28$

Sol.424.(c)
$$\Rightarrow \left(\frac{3}{5}\right)^{2x-1} \times \left(\frac{3}{5}\right)^4 = \left(\frac{3}{5}\right)^{15}$$
$$\Rightarrow \left(\frac{3}{5}\right)^{2x-1+4} = \left(\frac{3}{5}\right)^{15}$$
$\Rightarrow 2x + 3 = 15 \Rightarrow 2x = 12 \Rightarrow x = 6$

Sol.425.(c)
$\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} = a + b\sqrt{15}$

$\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} \times \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}+\sqrt{3}} = a + b\sqrt{15}$

$\frac{5+\sqrt{15}+\sqrt{15}+3}{5-3} = a + b\sqrt{15}$

$\frac{8+2\sqrt{15}}{2} = a + b\sqrt{15}$

$4 + \sqrt{15} = a + b\sqrt{15}$

hence , a = 4 and b = 1

Sol.426.(b) Let , x = 2 , y = -1 , z = $\frac{1}{2}$

For 1st case

,x + $\frac{1}{y}$ = 1 = 2 + $\frac{1}{(-1)}$ = 1

⇒ 2 - 1 = 1 ⇒ 1 = 1 (satisfied)

For 2nd case , y + $\frac{1}{z}$ = 1 ,

(-1) + $\frac{1}{1/2}$ = 1

⇒ -1 + 2 = 1 ⇒ 1 = 1 (satisfied)

Hence z + $\frac{1}{x}$ = $\frac{1}{2}$ + $\frac{1}{2}$ = 1

Sol.427.(a) Given , a + b +c = 0

Put a = 1, b = -1 , c=0

$\frac{a^2+b^2+c^2}{a^2-bc} = \frac{1^2+(-1)^2+0}{1^2-0}$ = 2

Sol.428.(a) $\frac{1+\sqrt{3}}{1-\sqrt{3}} + \frac{1-\sqrt{3}}{1+\sqrt{3}}$

$= \frac{(1+\sqrt{3})^2+(1-\sqrt{3})^2}{1-3}$

$= \frac{1+3+2\sqrt{3}+1+3-2\sqrt{3}}{-2} = \frac{8}{-2} = -4$

Sol.429.(d) $27^{1.5} \times 9^{1.25} \div 3^5 = 3^n$

$\Rightarrow 3^{4.5} \times 3^{2.5} \div 3^5 = 3^n \Rightarrow 3^7 \div 3^5 = 3^n$

$\Rightarrow 3^2 = 3^n \Rightarrow n = 2$

Sol.430.(b) $\sqrt{2} = 2^{\frac{1}{2}} = 2^{\frac{12}{2}} = 2^6 = 64$

$\sqrt[3]{3} = 3^{\frac{1}{3}} = 3^{\frac{12}{3}} = 3^4 = 81$

$\sqrt[4]{4} = 4^{\frac{1}{4}} = 4^{\frac{12}{4}} = 4^3 = 64$

And $\sqrt[6]{5} = 5^{\frac{1}{6}} = 5^{\frac{12}{6}} = 5^2 = 25$

Hence , $\sqrt[3]{3}$ *has maximum value.*

Sol.431.(c) $\frac{1}{x} + \frac{2}{3} = \frac{1}{2x} + \frac{3}{4}$

$\Rightarrow \frac{1}{x} - \frac{1}{2x} = \frac{3}{4} - \frac{2}{3}$

$\Rightarrow \frac{2-1}{2x} = \frac{9-8}{12}$

$\Rightarrow \frac{1}{2x} = \frac{1}{12} \Rightarrow 2x = 12 \Rightarrow x = 6$

Sol.432.(a) By the option

Option (i) is satisfied with the given statement. 15× 2 = 30 ,

16 × 3 = 48 , 17 × 4 = 68 , 18 × 5 = 90

Sum of the result = 30 + 48 + 68 + 90

= 236 (satisfied)

Sol.433.(c)

Given, x + y + z = 5 and xy + yz + zx = 8

$x^3 + y^3 + z^3 - 3xyz$

$=(x + y + z) [(x + y + z)^2 - 3 (xy + yz + zx)]$

$x^3 + y^3 + z^3 - 3xyz = 5 [(5)^2 - 24]$

$x^3 + y^3 + z^3 - 3xyz = 5$

Sol.434.(a) As $\frac{\sqrt{7}-1}{\sqrt{7}+1} - \frac{\sqrt{7}+1}{\sqrt{7}-1}$

= a + b$\sqrt{7}$,

$\Rightarrow \frac{7-2\sqrt{7}+1-(7+2\sqrt{7}+1)}{6}$

$= a + b\sqrt{7} \Rightarrow a + b\sqrt{7}$

$= -\frac{2\sqrt{7}}{3}$ So, a = 0 and b = - $\frac{2}{3}$

Sol.435.(d) Polynomial = x^2 + 8x + 15k

Let the roots of the given polynomial = a and b Given that

$a^2 + b^2 = 34$

Sum of roots = a + b = -8

Product of roots = ab = 15k

Now,

$(a + b)^2 = a^2 + b^2 + 2ab$

$\Rightarrow 64 = 34 + 2 \times 15k$

$\Rightarrow 30 = 30k \Rightarrow k = 1$

Sol.436.(a) $(a + b + c)^2$

$= a^2 + b^2 + c^2 + 2(ab + bc + ca)$

$\Rightarrow 5^2 = 29 + 2(ab + bc + ca)$

$\Rightarrow 25 - 29 = 2(ab + bc + ca)$

$\Rightarrow -4 = 2(ab + bc + ca)$

$\Rightarrow ab + bc + ca = -2$

Sol.437.(a) Given, a + b = ab

Then , b = ab-a , b= a(b - 1)

a : b = 1 : (b-1)

Sol.438.(b) Given : 2a + $\frac{1}{2a} = 6$

$\Rightarrow (2a)^2 + \frac{1}{(2a)^2} = 34$

$64a^6 + \frac{1}{64a^6} = (34)^3 - 3 \times 34$

$= 39202$

Sol.439.(b) $(\frac{7}{2} - \frac{x}{3} - \frac{1}{5}x^2)$ -

$(\frac{9}{2} + \frac{x}{2} + \frac{3}{5}x^2 + \frac{7}{4}x^3)$

$= -1 - \frac{5x}{6} - \frac{4}{5}x^2 - \frac{7}{4}x^3$

Sol.440.(a) Given that,

$\frac{x}{a} + \frac{Y}{b} + \frac{z}{c}$

$= \sqrt{3}$ & $\frac{a}{x} + \frac{b}{y} + \frac{c}{z} = 0$

Put a = b = c = 1

Now we have, x + y + z = $\sqrt{3}$.....(i)

$\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 0$

⇒xy + yz + zx = 0.....(ii)

Then, ' $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2}$ = ?

⇒ $x^2 + y^2 + z^2$ = ?

So,

⇒$(x + y + z)^2 = x^2 + y^2 z^2 + 2(xy + yz + zx)$

⇒$(\sqrt{3})^2 = x^2 + y^2 + z^2 + 2 \times 0$

⇒$x^2 + y^2 + z^2 = 3$

Sol.441.(b) The system of equations

2x + ky=11, 5x - 7y=5

For no solution,

$\frac{a_1}{a_2} = \frac{b_1}{b_2} \Rightarrow \frac{2}{5} = \frac{k}{-7}$

⇒ 5k = - 14 ⇒ $k = \frac{-14}{5}$

Sol.442.(d) Given equation : x^2 - 4x + 4b = 0

For real solution, ⇒ D = b^2 - 4ac > 0

$\Rightarrow 16 - 16b > 0$

$\Rightarrow 16 > 16b \Rightarrow 1 > b$

So, the value of b is less than 1.

Sol.443.(c) $x = 3 - \sqrt{2}$

Then, $3x^2 + 2x - 4$

$= 3(3 - \sqrt{2})^2 + 2(3 - \sqrt{2}) - 4$

$= 3(11 - 6\sqrt{2}) + 6 - 2\sqrt{2} - 4$

$= 33 - 18\sqrt{2} + 2 - 2\sqrt{2} = 35 - 20\sqrt{2}$

Sol.444.(c) $\frac{a}{b} + \frac{b}{a} = 1$

$\Rightarrow \frac{a^2+b^2}{ab} = 1 \Rightarrow a^2 + b^2 = ab$

Now, $a^3 + b^3 = (a + b)(a^2 + b^2 - ab)$

$\Rightarrow a^3 + b^3 = (a + b)(a^2 + b^2 - a^2 - b^2)$

$\Rightarrow a^3 + b^3 = (a + b)(a^2 + b^2 - a^2 - b^2)$

$\Rightarrow a^3 + b^3 = (a + b) \times 0 = 0$

Sol.445.(d) $\frac{x}{x^2-1} = \frac{A}{x-1} + \frac{B}{x+1}$

$\Rightarrow \frac{x}{x^2-1} = \frac{A(x+1)+B(x-1)}{(x-1)(x+1)}$

$\Rightarrow \frac{x}{x^2-1} = \frac{A(x+1)+B(x-1)}{(x^2-1)}$

$\Rightarrow x = Ax + A + Bx - B$

$\Rightarrow x = (A + B)x + (A - B)$

On comparing both sides, we get

A + B = 1 ..... e.q .(1)
A - B = 0 ..... E.q .(2)
Solving eq . (1) and (2) we get,
A = $\frac{1}{2}$ and B = $\frac{1}{2}$

Sol.446.(d) Given,
$x^3 + 5x^2 - 2x - 24$ ..... (1)
and one zero i.e. α = 2
We have to find other zeros i.e. β and γ
Now comparing equn. (1) with standard equn $ax^3 + bx^2 + cx + d = 0$ we get,
a = 1, b = 5, c = -2 and d = - 24
So α + β + γ = $\frac{-b}{a} = \frac{-5}{1}$ = - 5 .....(2)
αβ + βγ + αγ = $\frac{c}{a} = \frac{-2}{1}$ = - 2 .....(3)
and αβγ = $\frac{-d}{a} = \frac{-(-24)}{1}$ = 24 .....(4)
Putting value of α in equn. (4) we get,
(2) βγ = 24 ⇒ βγ = 12 ..... (5)
Now putting value of βγ and α in equn. (3) we get, (2)β + 12 + (2)γ = - 2
β + γ = - 7 ..... (6)
So from options only possible values of β and γ are - 3 and - 4.

Sol.447.(a) y = $3 + 2\sqrt{2}$
y = $2 + 1 + 2\sqrt{2}$
y = $\left(\sqrt{2}\right)^2 + (1)^2 + 2 \times \sqrt{2} \times 1$
y = $\left(\sqrt{2} + 1\right)^2 \Rightarrow \sqrt{y} = \sqrt{2} + 1$

Sol.448.(b) $x^3 + y^3$ = 9 and x + y = 3
By hit and trial method ,
Put x = 1 and y = 2 , we get
(x + y) = 1 + 2 = 3
$x^3 + y^3 = 1^3 + 2^3$ = 9 ... satisfied.
Then , $x^2 + y^2 = 1^2 + 2^2$ = 5

Sol.449.(b) 3x - y = 5 ⇒ 3x = y + 5
Therefore, $\frac{8^x}{2^y} = \frac{(2)^{3x}}{2^y} = \frac{(2)^{y+5}}{2^y}$
= $(2)^5$ ⇒ 32

Sol.450.(d) $(a - b)^2 = a^2 + b^2 - 2ab$
Given equation →
(10.24 × 10.24) - (10.24 × A) + (0.24 × 0.24)
$(10.24)^2 + (0.24)^2 - 2(10.24 \times 0.24)$
Value of A → 2 × 0.24 ⇒ 0.48

Sol.451.(a) $3x^2 - 5x + 2 = 0$
$3x^2 - 3x - 2x + 2 = 0$
3x(x - 1) - 2(x - 1) = 0
$(3x - 2)(x - 1) = 0$
x = $\frac{2}{3}$, and x = 1
then value of $\frac{a}{b} + \frac{b}{a} = \frac{2}{3} + \frac{3}{2} = \frac{13}{6}$

Sol.452.(a)
$\frac{1}{\sqrt{7}-\sqrt{3}} = \frac{1}{\sqrt{7}-\sqrt{3}} \times \frac{\sqrt{7}+\sqrt{3}}{\sqrt{7}+\sqrt{3}} = \frac{\sqrt{7}+\sqrt{3}}{4}$
= $\frac{(2.6457 + 1.732)}{4} = \frac{4.3777}{4}$ ⇒ 1.0944

Sol.453.(b) $3\sqrt{5} + \sqrt{125}$ = 17.88
→ $3\sqrt{5} + 5\sqrt{5}$ = 17.88
→ $\sqrt{5} = \frac{17.88}{8}$ ---- eq .(1)
$\sqrt{80} + 6\sqrt{5} = 4\sqrt{5} + 6\sqrt{5}$
= $\sqrt{5} \times 10$ -----eq .(2)
Put the value of eq .(1) into eq .(2)
$\sqrt{5} \times 10 = \frac{17.88}{8} \times 10$ = 22.35

Sol.454.(d) Given that a + b + c = 0 value putting a = 1, b = 1 and c = - 2
$\frac{(1-2)^2}{-2} + \frac{(-2+1)^2}{-2} + \frac{(2)^2}{1}$
= $-\frac{1}{2} - \frac{1}{2} + 4 = 3$

Sol.455.(b) $2x^2 + 19x + 45 = 0$
⇒ $2x^2 + 10x + 9x + 45 = 0$
⇒ 2x(x + 5) + 9(x + 5) = 0
⇒ (2x + 9) (x + 5) = 0
x = $-\frac{9}{2}$, x = - 5 e.q - 1
$2y^2 + 11y + 12 = 0$
⇒ $2y^2 + 8y + 3y + 12 = 0$
⇒ (2y + 3) (y + 4) = 0
y = $-\frac{3}{2}$, y = - 4 e.q - 2
Equation 1 and 2 equate we have x < y

Sol.456.(a) 2x + y = 35 ------eq .(1)
3x + 4y = 65 ----eq .(2)
Divide the eq .(1) and eq .(2)
$\frac{2x + y}{3x + 4y} = \frac{35}{65} \rightarrow \frac{2x + y}{3x + 4y} = \frac{7}{13}$
$(26x + 13y) = (21x + 28y)$
5x = 15y ⇒ $\frac{x}{y}$ = 3

Sol.457.(a) The variance of a set of value $x_1, x_2, \ldots x_n$ is given by the formula
$\sigma^2 = \frac{\Sigma x^2}{n} - (\frac{\Sigma x}{n})^2$

Sol.458.(a) $(x + y)^2 = x^2 + y^2 + 2xy$
$x^2 + y^2 = (\frac{\sqrt{3}+1}{\sqrt{3}-1} + \frac{\sqrt{3}-1}{\sqrt{3}+1})^2 - 2$
$x^2 + y^2 = (\frac{(\sqrt{3}+1)^2 + (\sqrt{3}-1)^2}{2})^2 - 2$
$x^2 + y^2 = (\frac{2\left((\sqrt{3})^2 + 1\right)}{2})^2 - 2$
$x^2 + y^2 = (\frac{8}{2})^2 - 2 \Rightarrow x^2 + y^2 = 14$

Sol.459.(d) Square root of $\frac{a^2}{b^2} + \frac{b^2}{a^2} + 2$
$\Rightarrow \sqrt{\frac{a^4+b^4+2a^2b^2}{a^2b^2}} \Rightarrow \sqrt{\frac{(a^2+b^2)^2}{a^2b^2}}$
$\Rightarrow \frac{a^2+b^2}{ab} \Rightarrow \frac{a}{b} + \frac{b}{a}$

Sol.460.(c) Sum of roots
= $(a + \sqrt{b}) + (a - \sqrt{b})$ = 2a
Product of roots = $(a + \sqrt{b})(a - \sqrt{b})$
= $(a^2 - b)$ Equation,
= x^2 - (sum of roots)x + (product of roots)
= $x^2 - (2a)x + (a^2 - b)$

Sol.461.(b)
$(a + b)^3 = a^3 + b^3 + 3ab(a + b)$

Sol.462.(c) $\frac{p}{b-c} = \frac{q}{c-a} = \frac{r}{a-b}$ = k
Therefore, p = k(b - c), q = k(c - a),
r = k(a - b)
p + q + r = k(b - c) + k(c - a) + k(a - b)
⇒ kb - kc + kc - ka + ka - kb ⇒ 0

Sol.463.(d) Standard equation of a quadratic equation = $ax^2 - bx + c = 0$
Where a, b and c are the natural numbers. Now from option , $-3x^2 + 4x - 7$ is a quadratic equation.

Sol.464.(a) A polynomial can have more than one term. An algebraic expression $p(x) = a_0x^n + a_1x^{n-1} + a_2x^{n-2} \ldots\ldots\ldots a_n$, where, a_0 , a_1 , a_2 are real numbers and n is a non - negative integer.
Now, check option one by one,
Here, option (a)is not a polynomial because the first term has y^0 and the second term has y^{-1}.

Sol.465.(d) $x^2 + 8x + 12 = 0$
⇒ $x^2 + 6x + 2x + 12 = 0$
⇒ $(x + 6)(x + 2) = 0$
⇒ $x = -2, -6$

Sol.466.(d)
$a^3 + b^3 + c^3$ = 3abc (when a + b + c = 0)
So, $(a^3 + b^3 + c^3)^2 = (3abc)^2 = 9a^2b^2c^2$

Sol.467.(c)
The given expression is in the form of $a_1x + b_1y + C_1 = 0$ and $a_2x + b_2y + C_2 = 0$
So,we have $\frac{a1}{a2} = \frac{b1}{b2} = \frac{c1}{c2} = \frac{1}{2}$
Hence, there are infinitely many solutions to the pair of linear equations.

Sol.468.(a) $3x^2$ - ax + 6 - ax^2 - 2x - 2 = 0
$3x^2 - ax^2 - ax - 2x + 4 = 0$
$x^2(3 - a) - x(a + 2) + 4 = 0$
Since, the given quadratic equation has equal roots.so, discriminant should be zero. b^2 - 4ac = 0

$\Rightarrow (a + 2)^2 - 4 \times (3 - a) \times 4 = 0$

$\Rightarrow a^2 + 4 + 4a - 16(3 - a) = 0$

$\Rightarrow a^2 + 4 + 4a - 48 + 16a = 0$

$\Rightarrow a^2 + 20a - 44 = 0$

$\Rightarrow a^2 + 22a - 2a - 44 = 0$

$\Rightarrow a(a + 22) - 2(a + 22) = 0$

$\Rightarrow (a + 22)(a - 2) = 0$

$\Rightarrow a = -22$ or 2 So, $a = 2$

Sol.469.(a) Since, 3 is the root of the given expression, we have :

$\Rightarrow 3^2 - 3a + b = 0 \Rightarrow 9 - 3a + b = 0$

$\Rightarrow 3a - b = 9$ ------- (1)

Since, 4 is the root of the given expression, we have :

$\Rightarrow 4^2 - 4a + b = 0 \Rightarrow 16 - 4a + b = 0$

$\Rightarrow 4a - b = 16$ ------- (2)

Subtracting eqn(2) from (1) we get

$a = 7$ and $b = 12$

Sol.470.(b) Let α, β be the roots of the given equation

$X^2 - 4X + K = 0$

$\alpha + \beta = 4$, $3 + \beta = 4 \Rightarrow \beta = 4 - 3 = 1$ So, the other root of the given equation is 1.

Sol.471.(c) $f(x) = (k - 1)x^2 + kx + 1$

Since, -3 is zero of the given polynomial.

Then, $f(-3) = 0$

$(k - 1)9 - 3k + 1 = 0$

$\Rightarrow 9k - 9 - 3k + 1 = 0 \Rightarrow 6k - 8 = 0 \Rightarrow 6k = 8$

$k = \frac{8}{6} = \frac{4}{3}$

Sol.472.(a) A quadratic equation has no solution, if Discriminant (D) < 0

$D < 0 \Rightarrow k^2 - 4k < 0 \Rightarrow k(k - 4) < 0$

$k > 0$ and $k - 4 < 0 \Rightarrow 0 < k < 4$

Sol.473.(d)

For two distinct real solution, $D > 0$

$k^2 - 4 \times 1 \times k > 0$

$k^2 - 4k > 0 \Rightarrow k(k - 4) > 0 \Rightarrow k < 0$ or $k > 4$

Sol.474.(b) Since ,

4 is the root of $x^2 + ax + b$ then, Using remainder theorem.we have ;

$4^2 + 4a + b = 32 \Rightarrow 16 + 4a + b = 32$

$4a + b = 16$ --------- (1)

Again, 4 is the root of $x^2 + bx + a$ then, Using remainder theorem.we have ;

$4^2 + 4b + a = 35 \Rightarrow 16 + 4b + a = 35$

$4b + a = 19$ --------- (2)

Subtracting eqn (1) from (2) × 4. we get:

$b = 4$ and $a = 3$

$a + b = 3 + 4 = 7$

Sol.475.(a) Since, the given quadratic equation $x^2 + kx + k = 0$ has equal roots.

$\Rightarrow D = 0 \Rightarrow k^2 - 4 \times 1 \times k = 0$

$k^2 - 4k = 0 \Rightarrow k(k - 4) = 0$ So, $k = 0$ or $k = 4$

Sol.476.(a) Let the two roots of the given equation be α, β

$x^2 - 6x + k = 0$

Sum of the roots $(\alpha + \beta) = 6$

$2 + \beta = 6 \Rightarrow \beta = 6 - 2 = 4$ So,

the other root of the given equation is 4

Sol.477.(a) Since, the given equation is in the form of $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$

For no solution, $\frac{a1}{a2} = \frac{b1}{b2} \neq \frac{c1}{c2}$.

so, $\frac{6}{15} = \frac{-5}{k} \Rightarrow 6k = -15 \times 5 = -75$

$k = -\frac{75}{6} = -12.5$

Sol.478.(c) Let α & β are the two roots of the given polynomial $f(x) = 5x^2 - 7x + 2$

So, $\alpha + \beta = \frac{7}{5}$ and $\alpha\beta = \frac{2}{5}$

Now, $\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha + \beta}{\alpha\beta} = \frac{\frac{7}{5}}{\frac{2}{5}} = \frac{7}{2}$

Sol.479.(b) Since, the given quadratic equation $4x^2 + 4\sqrt{3}x + k = 0$ has equal roots. $\Rightarrow D = 0$

$b^2 - 4ac = 0 \Rightarrow (4\sqrt{3})^2 - 4 \times 4 \times k = 0$

$48 - 16k = 0 \Rightarrow 48 = 16k \Rightarrow k = \frac{48}{16} = 3$

Sol.480.(a) $3x^2 + kx + k = 0$

If Equation has no solution

$\Rightarrow b^2 - 4ac < 0$

Here, $a = 3$, $b = k$, $c = k$

$\Rightarrow k^2 - 4 \times 3k < 0$

$\Rightarrow k^2 - 12k < 0$

$\Rightarrow k(k - 12) < 0$

$\Rightarrow k > 0, k - 12 < 0$

$\Rightarrow 0 < k < 12$

Sol.481.(d)

$12x^2 - ax + 7 = ax^2 + 9x + 3$

$\Rightarrow 12x^2 - ax^2 - ax - 9x + 7 - 3 = 0$

$\Rightarrow (12 - a)x^2 - (a + 9)x + 4 = 0$

For one solution, $D = b^2 - 4ac = 0$

$\Rightarrow (a + 9)^2 - 4(12 - a) \times 4 = 0$

$\Rightarrow a^2 + 81 + 18a - 192 + 16a = 0$

$\Rightarrow a^2 + 34a - 111 = 0$

$\Rightarrow (a + 37)(a - 3) = 0 \Rightarrow a = 3$

Ratio & Proportion

Key-points:-

1) What are antecedent and consequent?
In the form $x: y$; x is called the *antecedent* and y is called *consequent*.

2) $x: y$ can also be written as $\frac{x}{y}$

3) Duplicate ratio (square) :-

Duplicate ratio of x : y will be $x^2 : y^2$

4) Sub-duplicate Ratio (square root):-
Sub-duplicate Ratio of x : y will be $\sqrt{x}: \sqrt{y}$

5) Triplicate Ratio (cube) :-

Triplicate ratio of x : y will be $x^3 : y^3$

6) Sub-triplicate Ratio (cube root)

Sub-triplicate Ratio of x : y will be $\sqrt[3]{x}: \sqrt[3]{y}$

7) Inverse ratio :- $x : y$ will be $y : x$

8) Compound Ratio : If two or more ratios are given, then the antecedent of one is multiplied with antecedent of the other and respective consequents are also multiplied.

If a : b, c : d and e : f are three ratios, then their compound ratio will be $\frac{ace}{bdf}$.

9) 3rd Proportional:- 3rd proportion of a and b i.e. a : b :: b : x ⇒

Then , $x = \frac{b^2}{a}$

10) 4th Proportional: 4th proportional of a, b and c i.e. a : b :: c : x ⇒

Then , $x = \frac{b \times c}{a}$

11) Componendo and dividendo rule:

If a : b :: c : d , Then ⇒ $\frac{a+b}{a-b} = \frac{c+d}{c-d}$

12) Mean Proportion : Mean proportion of two numbers, a and b, is given by $\sqrt{ab}$.

Partnership

Concept 1

The ratio of profits of two or more partners will be equal to the ratio of their respective equivalent investment ratio.

Equivalent investment = (Amount Invested) × (Time for which the amount is invested).

We will take some examples to understand the concepts of partnership.

Example 1: A invests Rs. 10,000 and B invests Rs. 20,000 for a period of 1 year each. The profit, after 1 year will be divided in the ratio:

$$\frac{Profit\ of\ A}{Profit\ of\ B} = \frac{10000 \times 12}{20000 \times 12} = \frac{1}{2}$$

Example 2: A invests Rs.100 in a business. After 6 months B joins with an investment of Rs. 200. At the end of 1 year C joins with an investment of Rs.100. What will be the ratio of profit after 3 years?

	A	B	C
Amount(Rs.)	100	200	100
Time(month)	36	30	24
Equivalent Investment	3600 :	6000 :	2400
Profit Ratio	3 :	5 :	2

Example 3: In the previous case if the total profit after 3 years is 10,000. What will be the share of A?

Share of A in total profit =

$\frac{3}{3+5+2} \times 10{,}000 = \frac{3}{10} \times 10000$

$\Rightarrow 3 \times 1000 = 3000$

Note: In case someone invests in-between the total period of time, just take care for what time an amount is invested. Similarly there can be a case when someone opts out in that case also, the time for which the amount was invested will be taken into consideration and not the full period.

Concept 2

If $\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \frac{f}{g}$ = K, where K is constant . Then , K = $\frac{a+c+e+f}{b+d+f+g}$

Example : $\frac{1+x}{2-x} = \frac{9-x}{3+x}$ = K, Find the value of K ?

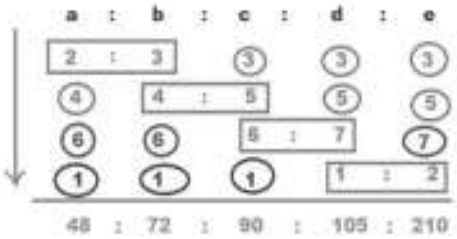
K = $\frac{1+x+9-x}{2-x+3+x} = \frac{10}{5} = 2$

Concept 3

If two or three ratios are given , and we have to find an individual ratio of all of them, then we take LCM of the common entities and then balancing the common entities ,we get the required ratio.

E.g. a : b = 3 : 4 , b : c = 6 : 7.
LCM of the common entities i.e
b = (4. 6) =12
a : b = 3 : 4) × 3 = 9 : 12
b : c = 6 : 7) × 2 = 12 : 14
So, a : b : c = 9 : 12 : 14

Note : In case there are more than three ratios given , then the LCM approach will be tedious in finding the individual ratio of the given entities.
Alternative method
If a : b = 2 : 3, b : c = 4 : 5
c : d = 6 : 7, d : e = 1 : 2



To understand this concept we will take some examples

Example 1 : ₹5600 is to be divided among A, B, C & D in such a way that the ratio of share of A : B is 1 : 2, B : C is 3 : 1 , C : D is 2 : 3, find the share of A and B taken together ?
Share of A : B = 1 : 2
Share of B : C = 3 : 1
Share of C : D = 2 : 3
A : B : C : D →
1 × 3 × 2 : 2 × 3 × 2 : 2 × 1 × 2 : 2 × 1 × 3
= 6 : 12 : 4 : 6 or 3 : 6 : 2 : 3
Sum of the share of all of them
= 3 + 6 + 2 + 3 = 14 unit
Total share of (A + B) = $\frac{6+3}{14}$ × 5600
= 9 × 400 = ₹3600

Example 2 : Sum of ₹ x is divided among A, B, C such that the ratio of the shares of A and B is 6 : 7 and that of B and C is 3 : 2. If the difference of the share of A and C is ₹540 . Find the value of x
Share of A and B = 6 : 7
Share of B and C = 3 : 2
Ratio of the shares of A, B and C = 6 × 3 : 3 × 7 : 7 × 2 = 18 : 21: 14
Diff. of A and C = 18 - 14 = 4 unit, which corresponds to ₹540
Total share of A, B and C = 18 + 21 + 14
= 53 unit = $\frac{540}{4}$ × 53 = ₹ 7155

Concept 4

If numerator and denominator of a ratio is multiplied and divided by same number, the ratio remains unchanged .e.g

$\frac{a}{b} = \frac{a \times k}{b \times k} = \frac{\frac{a}{k}}{\frac{b}{k}}$

Ratio is independent of change in scale only and not of origin.

Concept 5

If there is 'n' number of unequal fractions such as $\frac{a1}{b1}, \frac{a2}{b2}, \frac{a3}{b3}, \frac{a4}{b4}$..... $\frac{an}{bn}$ then the ratio of $(a_1 + a_2 + a_3 + ..a_n)$ and $(b_1 + b_2 + b_3 .. b_n)$ lies between lowest and highest values of these fractions.

Example:

three unequal fractions are $\frac{1}{2}, \frac{2}{3}, \frac{4}{7}$.
So, the ratio of (1 + 2 + 4) : (2 + 3 + 7)

= 7 : 12. Among these fractions, lowest fraction is $\frac{1}{2}$ and the highest fraction is $\frac{2}{3}$ so, the required value lies between $\frac{1}{2}$ and $\frac{2}{3}$.

Concept 6:
If aA = bB = cC, where a,b,c are constants and A, B, C are variables. Then the ratio of A : B : C = b × c : c × a : a × b.
Example: if 3A = 4B = 5C, then find A:B:C
The ratio of A : B : C = 4 × 5 : 5 × 3 : 3 × 4 = 20 : 15 : 12

Variety Questions

Q.1. If 5 + x, 2x + 7, 6x + 9, and y are in proportion when x = 2, find the value of y.
Group D 17/08/2022 (Evening)
(a) 33 (b) 28 (c) 42 (d) 45

Q.2. If 9 : 12 :: 12 : x, and 28 : 42 :: 42 : y, then the value of 2x + y is:
Group D 18/08/2022 (Morning)
(a) 95 (b) 79 (c) 69 (d) 84

Q.3. If three numbers are in the ratio 5 : 6 : 8 and the sum of their squares is 1250, then the product of those numbers is:
Group D 18/08/2022 (Morning)
(a) 2400 (b) $2400\sqrt{10}$
(c) 1200 (d) $1200\sqrt{10}$

Q.4. The monthly incomes of two friends Anuj and Mathew, are in the ratio 5:7 and each of them saves ₹10,000 every month. If the ratio of their expenditure is 2:3, find the income of Anuj.
Group D 22/08/2022 (Evening)
(a) ₹5,000 (b) ₹20,000
(c) ₹50,000 (d) ₹15,000

Q.5. A sum of money is to be distributed among four members A, B, C, D in the ratio 4 : 7 : 9 : 3. If C gets ₹720 more than D. Find D's share.
Group D 23/08/2022 (Morning)
(a) ₹240 (b) ₹160 (c) ₹360 (d) ₹480

Q.6. If 48 : x :: x : 75, and x > 0, then what is the value of x?
Group D 23/08/2022 (Afternoon)
(a) 57 (b) 51 (c) 63 (d) 60

Q.7. If x = 3, then find the fourth proportional of x + 7x, x + 5 and x + 6.
Group D 24/08/2022 (Afternoon)
(a) 8 (b) 9 (c) 24 (d) 3

Q.8. A 3-digit number is such that the ratio of its units digit, tens digit and hundreds digit is 1 : 2 : 3. The sum of this number and the reversed number obtained by reversing the order of its digits is 1332. Find the number ?
Group D 26/08/2022 (Evening)
(a) 246 (b) 414 (c) 123 (d) 963

Q.9. If 12 : x :: x : 27, and 25 : y :: y : 36, when x and y are both positive numbers, find x : y.
Group D 29/08/2022 (Evening)
(a) 7 : 9 (b) 3 : 5 (c) 4 : 7 (d) 5 : 6

Q.10. A vessel is one-fourth full of water. After adding 10 cups of water to it, the vessel gets three-fourth full. Find the capacity of the vessel in cups.
Group D 30/08/2022 (Evening)
(a) 20 (b) 25 (c) 27 (d) 22

Q.11. Two numbers are in the ratio 5 : 8. If the first number increases by 40% and second number decreases by 15%, the new ratio becomes _____.
Group D 01/09/2022 (Morning)
(a) 37 : 39 (b) 35 : 34
(c) 23 : 26 (d) 12 : 17

Q.12. The third proportional of (a + b) and $(a + b)^2$ is
Group D 01/09/2022 (Afternoon)
(a) $(a + b)^3$ (b) (a + b) (c) a (d) b

Q.13. Krishna has a few coins of 1 rupee, 50 paise and 25 paise in the ratio: $\frac{1}{4} : \frac{1}{2} : \frac{1}{2}$ If the number of 25 paise coins is 100, then the total amount with Krishna is:
Group D 01/09/2022 (Evening)
(a) ₹100 (b) ₹75 (c) ₹125 (d) ₹120

Q.14. The ratio of the income of Seema and Darshan is 7 : 5. They save ₹12,000 and ₹9,000 respectively. If the ratio of their expenses is 17 : 12, then find the total expenditure (in Rs) of Seema and Darshan.
Group D 06/09/2022 (Morning)
(a) 93,000 (b) 81,000
(c) 87,000 (d) 75,000

Q.15. Find the ratio between the third proportional of 20 and 50 and the mean proportion of 9 and 16.
Group D 06/09/2022 (Afternoon)
(a) 25 : 2 (b) 12: 125
(c) 32 : 25 (d) 125 : 12

Q.16. When x is added to each of 11, 14, 31 and 38, then the numbers so obtained, in this order, are in proportion. Then, if 3x : y :: y : (8x - 5), and y> 0, what is the value of y ?
Group D 08/09/2022 (Afternoon)
(a) 12 (b) 18 (c) 15 (d) 16

Q.17. The third proportional to $(x^3 - y^3)$ and (x - y) is:
Group D 08/09/2022 (Evening)
(a) $\frac{x-y}{x^2+xy+y^2}$ (b) $\frac{(x-y)^2}{x^2+xy+y^2}$
(c) $\frac{x-y}{x^2-xy+y^2}$ (d) $\frac{(x-y)^2}{x^2+xy+y^2}$

Q.18. A sum of ₹4,800 is divided between A, B and C such that the ratio of the share of A to the combined share of B and C is 3 : 5 and C receives $\frac{5}{7}$ of what A and B together receive. The difference (in ₹) of A's share and B's share is;
Group D 09/09/2022 (Morning)
(a) 1,000 (b) 800 (c) 900 (d) 850

Q.19. The two numbers whose mean proportional is 14 and third proportional is 4802 are:
Group D 12/09/2022 (Afternoon)
(a) 2 and 98 (b) 8 and 24
(c) 7 and 28 (d) 4 and 49

Q.20. The mean proportional between 8 + 4√2 and 6 - 3√2 is:
Group D 13/09/2022 (Morning)
(a) 3√6 (b) √6 (c) 2√6 (d) 4√6

Q.21. The sum of two numbers is 20 and their difference is 16. The ratio of the larger number to the smaller number is:
Group D 15/09/2022 (Evening)
(a) 9 : 1 (b) 2 : 11 (c) 1 : 9 (d) 11 : 2

Q.22. The distance between two points on a map is 5 cm. The scale of the map is 1 : 400000. The actual distance between the two points (in km) is:
Group D 16/09/2022 (Evening)
(a) 200 (b) 20 (c) 2000 (d) 20000

Q.23. Given that c is the third proportional of 15 and b. If b is the sum of first three odd natural numbers, then the value of c is:
Group D 17/09/2022 (Afternoon)
(a) $\frac{29}{5}$ (b) $\frac{27}{5}$ (c) $\frac{26}{5}$ (d) $\frac{28}{5}$

Q.24. ₹2,000 is divided among A, B and C such that half of A's part, one-third of B's part and one-fifth of C's part are equal. What is A's part (in₹) ?
Group D 17/09/2022 (Evening)
(a) 600 (b) 400 (c) 1000 (d) 200

Q.25. From a book containing 264 pages, the teacher taught of $\frac{2}{3}$ the total number of pages and the children

studied $\frac{1}{8}$ of the remaining pages at home. How many pages were yet to be either taught by the teacher or studied on their own by the students ?
Group D 18/09/2022 (Morning)
(a) 80 (b) 55 (c) 88 (d) 77

Q.26. If a : b :: b : c ; c = 4a; and b = 6, find the positive value of c.
Group D 18/09/2022 (Evening)
(a) 7 (b) 12 (c) 8 (d) 9

Q.27. ₹651 is divided among A, B, C in such a way that twice of A's share, thrice of B's and five times of C's share are equal. Find C's share.
Group D 20/09/2022 (Afternoon)
(a) ₹150 (b) ₹210 (c) ₹315 (d) ₹126

Q.28. If $x^3y : xy :: xy : a$, then which of the options below gives the value of a ?
Group D 20/09/2022 (Evening)
(a) $\frac{y^2}{x}$ (b) $\frac{y^2}{x^2}$ (c) $\frac{y}{x}$ (d) $\frac{y}{x^2}$

Q.29. Find b if 256, b and 324 are in continued proportion.
Group D 20/09/2022 (Evening)
(a) 296 (b) 308 (c) 312 (d) 288

Q.30. If 60% of A = 1.2 of B = $\frac{2}{5}$ of C, then find A : B : C.
Group D 26/09/2022 (Morning)
(a) 3 : 1 : 2 (b) 1 : 2 : 3
(c) 3 : 2 : 1 (d) 2 : 1 : 3

Q.31. If 7(x) + 5, 7(x) + 4, 5(x) + 5 and y are in proportion when x = 5, find the value of y.
Group D 26/09/2022 (Morning)
(a) 29 (b) 29.5 (c) 29.75 (d) 29.25

Q.32. Initially Ram had ₹4 with him and Shyam had ₹7 with him. Jatin gave each of Ram and Shyam an equal amount of money and after that the amounts Ram and Shyam had were in the ratio 7 : 9. How much money (in₹) did Jatin give to each of Ram and Shyam ?
Group D 26/09/2022 (Evening)
(a) 6.00 (b) 6.50 (c) 5.50 (d) 7.00

Q.33. 145 is divided into two parts, a and b, such that a : b :: 2 : 3. Also, a : c :: c : b and c > 0. Find the value of c. correct to the nearest integer.
Group D 27/09/2022 (Evening)
(a) 65 (b) 61 (c) 75 (d) 71

Q.34. The ratio of the income of A to that of B is 3 : 5. The expenditure of A is $\frac{7}{12}$ of his income, and the expenditure of B is $\frac{8}{15}$ of his income. The positive difference between their expenditures is ₹14,300. Find A's income.
Group D 07/10/2022 (Morning)
(a) ₹48,300 (b) ₹16,800
(c) ₹46,800 (d) ₹78,000

Q.35. The ratio of the numbers of ₹10 notes, ₹20 notes and ₹50 notes in a box is given as 3 : 5 : 7. The total amount of cash in the box is ₹3,360. Find the number of ₹20 notes in that box.
Group D 07/10/2022 (Evening)
(a) 25 (b) 35 (c) 45 (d) 15

Q.36. Ravish has read $\frac{4}{5}$ of a book while Soma has read only $\frac{5}{8}$ of the book she is reading. Both however have another 120 pages of their respective books remaining to be read. What fraction of the number of pages read by Ravish has been read by Soma ?
NTPC CBT II Level 4 (10/05/2022) Shift 1
(a) $\frac{5}{12}$ (b) $\frac{7}{12}$ (c) $\frac{25}{32}$ (d) $\frac{1}{2}$

Q.37. Three friends A, B and C divide ₹5525 amongst them in such a way that if ₹50, ₹100 and ₹75 are removed from the sums that A, B and C received respectively, then the share of the sums that they get would have been in the ratio of 11 : 18 : 24. How much did C initially receive ?
NTPC CBT II Level 2 (13/06/2022) Shift 2
(a) ₹ 1150 (b) ₹ 2475
(c) ₹1900 (d) ₹ 2325

Q.38. If A : B = 1.2 : 2, B : C = 1.5 : 2, and C : D = 2 : 3, then B : D is equal to:
NTPC CBT II Level 3 (14/06/2022) Shift 1
(a) 5 : 6 (b) 1 : 2 (c) 3 : 4 (d) 2 : 3

Q.39. In a school, $\frac{5}{8}$ of the number of students are girls and the rest boys, $\frac{2}{5}$ of the number of the girls are below 12 years of age and $\frac{4}{9}$ of the boys are 12 years of age or above. If the total number of students is 288, how many students are below 12 years of age ?
NTPC CBT II Level 3 (14/06/2022) Shift 1
(a) 124 (b) 132 (c) 144 (d) 140

Q.40. The ratio of ladies to gents numbers in a club is 3 : 2. Recently, 300 ladies joined the club and the ratio became 5 : 2. The number of lady members now in the club is :
RRB NTPC 28/12/2020 (Morning)
(a) 900 (b) 1200 (c) 750 (d) 600

Q.41. The numerator of a fraction is 2 less than the denominator. If the numerator is multiplied by 2 and the denominator is multiplied by 3. then the fraction becomes $\frac{2}{9}$. The fraction is :
NTPC CBT - I 28/12/2020 (Evening)
(a) $\frac{5}{7}$ (b) $\frac{3}{5}$ (c) $\frac{7}{9}$ (d) $\frac{1}{3}$

Q.42. A man invested $\frac{1}{2}$ of his capital at 5% rate of interest per annum , $\frac{1}{3}$ of his capital at 8% per annum and the remaining at 10% rate of interest per annum. His total income from the three investments is Rs. 820.00 in a year. The total capital invested is :
NTPC CBT - I 28/12/2020 (Evening)
(a) Rs. 16000.00 (b) Rs. 6400.00
(c) Rs. 8000.00 (d) Rs. 12000.00

Q.43. Three persons are invested an amount of money in a business in the ratio $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$. At the end of a year, the total profit was Rs. 15600. The largest share received in profit will be :
NTPC CBT - I 28/12/2020 (Evening)
(a) Rs.7200 (b) Rs.8000
(c) Rs.7500 (d) Rs.7000

Q.44. The product of three numbers is 10290 and the numbers are in the ratio of 3 : 5 : 2. The greatest number among the three numbers is :
NTPC CBT - I 29/12/2020 (Evening)
(a) 21 (b) 35 (c) 60 (d) 75

Q.45. Four fifths of a number is 12 more than three fourths of the number. Find the number.
NTPC CBT - I 30/12/2020 (Evening)
(a) 120 (b) 240 (c) 160 (d) 200

Q.46. The sum of two numbers is 25 and their difference is 15. The ratio of the numbers is :
NTPC CBT - I 04/01/2021 (Morning)
(a) 4 : 1 (b) 2 : 3 (c) 5 : 3 (d) 3 : 2

Q.47. An airplane is carrying 500 passengers, of which 45% are men and 20% are children. The ratio of the number of men, women and children in the lowest terms is :
NTPC CBT - I 05/01/2021 (Morning)
(a) 4 : 7 : 9 (b) 7 : 4 : 9
(c) 9 : 7 : 4 (d) 9 : 4 : 7

Q.48. x and y vary directly with each other. When x is 10, y is 15. Which of the

following is NOT a pair of corresponding values of x and y ?
NTPC CBT - I 05/01/2021 (Evening)
(a) 25, 37.5 (b) 2, 3 (c) 15, 20 (d) 8, 12

Q.49. The difference between two numbers is 5. If 25 is subtracted from the smaller number and 20 is added to the greater number the ratio becomes 1 : 2. What is the greater number ?
NTPC CBT - I 08/01/2021 (Morning)
(a) 90 (b) 85 (c) 80 (d) 75

Q.50. In an election the votes cast for two candidates were in the ratio 2 : 9. If the successful candidate received 984321 votes, find the total votes polled.
NTPC CBT - I 08/01/2021 (Evening)
(a) 1203059 (b) 1320059
(c) 1302059 (d) 1230059

Q.51. If (a + b) : (b + c) : (c + a) is 6 : 7 : 8 and also a + b + c = 14. Then what is the value of C ?
NTPC CBT - I 10/01/2021 (Evening)
(a) 6 (b) 8 (c) 12 (d) 10

Q.52. Ajay, Sunil, Krishna and Sumit are good friends. They rent a house together at Rs 15,000 per month. Ajay lives in this house for only 15 days in a month. Krishna and Sumit are also working and they decide to jointly contribute Rs 10,000 as their share of the rent. Sunil lives in the house for the whole month. If Ajay and Sunil decide to contribute to the rent based on the number of days they live in the house, what would be the share of rent paid by Ajay, Sunil, Sumit and Krishna respective ?
NTPC CBT - I 11/01/2021 (Morning)
(a) $\frac{1}{3}, \frac{1}{3}, \frac{1}{9}, \frac{2}{3}$ (b) $\frac{1}{9}, \frac{2}{9}, \frac{1}{3}, \frac{1}{3}$
(c) $\frac{1}{9}, \frac{1}{3}, \frac{1}{3}, \frac{2}{9}$ (d) $\frac{1}{3}, \frac{1}{3}, \frac{1}{4}, \frac{1}{4}$

Q.53. If the ratio of the 11th term of an AP to its 18th term is 2 : 3, find the ratio of the sum of its first five terms to the sum of its first 10 terms.
NTPC CBT - I 12/01/2021 (Evening)
(a) 17 : 6 (b) 5 : 4 (c) 1 : 2 (d) 6 : 17

Q.54. If A is 80% more than B and B is 20% less than C , then what will be the value of A : B : C ?
NTPC CBT - I 18/01/2021 (Evening)
(a) 36 : 20 : 25 (b) 36 : 5 : 20
(c) 20 : 25 : 36 (d) 36 : 25 : 20

Q.55. $\frac{13}{18}$ of the residents of a housing society own cars and $\frac{48}{65}$ of the car owners have purchased covered parking space. If 136 of the residents parked in the open, how many residents were there in the society ?
NTPC CBT - I 31/01/2021 (Morning)
(a) 650 (b) 720 (c) 630 (d) 900

Q.56. In a carton containing a dozen mirrors is dropped, which of the following can be the ratio of number of broken mirrors to unbroken mirrors ?
NTPC CBT - I 09/02/2021 (Morning)
(a) 3 : 7 (b) 3 : 2 (c) 4 : 7 (d) 5 : 1

Q.57. Which of these sets of numbers are in continued proportion ?
(i) 0.4, 3.6, 3.24
(ii) 7, 21, 63
(iii) 2.4, 9.6, 38.4
RRB JE 02/06/2019 (Afternoon)
(a) (i), (ii) and (iii) (b) (i) and (ii)
(c) (ii) and (iii) (d) (ii) only

Q.58. In a bag, the ratio of red balls to green balls is 4 : 9. If 7 more red balls are added to the bag, the ratio of red balls to green balls will become 5 : 6. How many green balls are there in the bag ?
ALP Tier - I 14/08/2018 (Evening)
(a) 12 (b) 27 (c) 9 (d) 18

Q.59. Pen, Pencil, and Eraser in a box are in the ratio 3 : 2 : 1. If the prices of pen, pencil and eraser are 3 Rs , 2 Rs and 2 Rs, respectively, and If the cost of the box is 90 Rs. , then Find the number of pens in the box.
RPF Constable 17/01/2019 (Morning)
(a) 17 (b) 19 (c) 16 (d) 18

Q.60. Aamir distributed 875 gifts among 4 children. The part of the first child is twice the portion of the other child, three times the size of the third, child and four times the fourth child's share. Show the sum of the total gifts received by the first and the second child.
RPF S.I. 05/01/2019 (Morning)
(a) 610 (b) 630 (c) 620 (d) 640

Practice Questions

RRC Group D
(17/08/2022 to 11/10/2022)

Q.61. If 6, 18, 39, and x are in proportion, then find the value of x.
Group D 17/08/2022 (Morning)
(a) 117 (b) 112 (c) 139 (d) 115

Q.62. If a : b = 2 : 3 and b: c = 3 : 4, then a : b : c = ?
Group D 17/08/2022 (Evening)
(a) 3 : 4 : 2 (b) 2 : 4 : 3
(c) 2 : 3 : 4 (d) 3 : 2 : 4

Q.63. If the difference between two numbers is 52 and they are in the ratio 7 : 3, then find the greater of the two numbers.
Group D 18/08/2022 (Morning)
(a) 84 (b) 65 (c) 91 (d) 70

Q.64. Two boxes have chocolates in the ratio 7 : 5. If the difference in the number of chocolates is 28. find the number of chocolates in the box with larger numbers.
Group D 18/08/2022 (Morning)
(a) 77 (b) 84 (c) 98 (d) 91

Q.65. If 40 : 35 :: 35 : x, find the value of x.
Group D 18/08/2022 (Evening)
(a) $\frac{245}{8}$ (b) $\frac{49}{16}$ (c) $\frac{49}{14}$ (d) $\frac{49}{8}$

Q.66. A 91 cm-long wire is cut into two pieces so that one piece length is three-fourth of the other. Find the length of the shorter piece.
Group D 22/08/2022 (Morning)
(a) 42.17 cm (b) 39 cm
(c) 36.23 cm (d) 38 cm

Q.67. Two numbers are in the ratio 5 : 3. If the difference between the numbers is 54, then find the smaller number.
Group D 22/08/2022 (Afternoon)
(a) 91 (b) 135 (c) 81 (d)115

Q.68. The mean proportional between the numbers p and q is 8. Which of the following pairs of numbers can be the values of p and q .
Group D 22/08/2022 (Afternoon)
(a) 12 and 3 (b) 16 and 4
(c) 12 and 16 (d) 10 and 6

Q.69. The mean proportional of 16 and 144 is
Group D 22/08/2022 (Afternoon)
(a) 44 (b) 36 (c) 48 (d) 34

Q.70. The third proportional of 10 and 50 is.
Group D 24/08/2022 (Morning)
(a) 300 (b) 1250 (c) 250 (d) 125

Q.71. Find the Fourth proportional of 12, 24 and 45.
Group D 24/08/2022 (Afternoon)
(a) 90 (b) 25 (c) 30 (d) 60

Q.72. If $\frac{a}{b} = \frac{4}{3}$ and 3a + 2b = 24, then find the value of a.
Group D 24/08/2022 (Afternoon)
(a) 4 (b) $\frac{13}{3}$ (c) 5 (d) $\frac{16}{3}$

Q.73. If x : y = 7 : 3, then $(x^2 + y^2)$

: $(x^2 - y^2)$ = ?
Group D 25/08/2022 (Morning)
(a) 29 : 20 (b) 25 : 4 (c) 5 : 2 (d) 5 : 1

Q.74. Find the fourth proportional of 4a + 7,11a + 3 and 6a, if a = 2.
Group D 25/08/2022 (Afternoon)
(a) 20 (b) 15 (c) 30 (d) 25

Q.75. An amount is divided between two friends in the ratio 2 : 5. If the second part is ₹6 more than the first, then the initial amount is :
Group D 25/08/2022 (Afternoon)
(a) ₹13 (b) ₹12 (c) ₹23 (d) ₹14

Q.76. Find the mean proportional between 17 and 68.
Group D 25/08/2022 (Evening)
(a) 46 (b) 42 (c) 34 (d) 38

Q.77. A sum of money is distributed among four persons A, B, C and D in the ratio 4 : 7 : 9 : 3. If C gets ₹800 more than B, then find the amount that D gets.
Group D 26/08/2022 (Morning)
(a) ₹1,000 (b) ₹1,500 (c) ₹1,400 (d) ₹1,200

Q.78. If (2x + 7y) : (4x - 3y) :: 8 : 3 , then find the value of xy.
Group D 26/08/2022 (Afternoon)
(a) 45 : 26 (b) 20 : 19
(c) 11 : 13 (d) 26 : 45

Q.79. In a class there are 40 students (only boys and girls). The number of girls is three-sevenths of the number of boys. Find the number of boys in the class.
Group D 29/08/2022 (Afternoon)
(a) 28 (b) 12 (c) 24 (d) 32

Q.80. The ratio of the number of boys to that of the girls in a school is 7 : 9. If the number of girls in the school is 189, then the number of boys in that school is:
Group D 29/08/2022 (Evening)
(a) 168 (b) 126 (c) 147 (d) 105

Q.81. If 49 : x :: x : 81, and 64 : y :: y : 169, where x and y are both natural numbers, then find the value of 2x + 3y.
Group D 30/08/2022 (Afternoon)
(a) 348 (b) 438 (c) 126 (d) 312

Q.82 A number is divided into two parts such that one part of the number is 10 more than the other part, and the ratio of the two parts is 4 : 3. Find the initial number.
Group D 30/08/2022 (Afternoon)
(a) 40 (b) 70 (c) 80 (d) 30

Q.83. If 144 : b :: b : 36, and b > 0, find the value of b.
Group D 30/08/2022 (Afternoon)
(a) 36 (b) 27 (c) 12 (d) 72

Q.84. If 7, 12, 21 and x are in proportion, the value of x is:
Group D 30/08/2022 Evening)
(a) 36 (b) 24 (c) 35 (d) 27

Q.85. Two numbers are in the ratio 2 : 7. If the first number is increased by 14 and the second number is decreased by 6, then the ratio becomes 4 : 3. What is the sum of the original two numbers?
Group D 02/09/2022 (Morning)
(a) 45 (b) 27 (c) 36 (d) 18

Q.86. If 1.6 : 0.6 :: 0.6: x, find the value of x.
Group D 02/09/2022 (Afternoon)
(a) 0.225 (b) 0.275 (c) 0.98 (d) 0.25

Q.87. If a : b = 7 : 9 and b : c = 15 : 7, then a : b : c is:
Group D 02/09/2022 (Afternoon)
(a) 35 : 45 : 25 (b) 35 : 45 : 21
(c) 21 : 35 : 45 (d) 45 : 35 : 21

Q.88. If 3.2 : x :: x : 16.2, and x > 0, then find the value of x.
Group D 02/09/2022 (Evening)
(a) 6.3 (b) 9.7 (c) 7.2 (d) 5.4

Q.89. The salaries of A and B are in the ratio 3 : 4. On increasing the salaries of both A and B by ₹ 3,000, the new ratio of their salaries becomes 18 : 23. Find the salary of A after the increase.
Group D 06/09/2022 (Afternoon)
(a) ₹12,000 (b) ₹23,000
(c) ₹21,000 (d) ₹18,000

Q.90. If ₹2,400 is to be distributed between A and B in the ratio of 7: 5, then the share of B is:
Group D 08/09/2022 (Morning)
(a) ₹1,300 (b) ₹1,600 (c) ₹1,900 (d) ₹1,000

Q.91. Two numbers are in the ratio 7 : 5. If their sum is 360, then the difference between them is:
Group D 08/09/2022 (Afternoon)
(a) 60 (b) 70 (c) 90 (d) 80

Q.92. If 63 chocolates are to be divided between A and B in the ratio 4 : 5, then how many chocolates will B get?
Group D 13/09/2022 (Afternoon)
(a) 35 (b) 49 (c) 28 (d) 27

Q.93. The ratio of the sum of two numbers and their difference is 8: 3. The ratio of the greater number to the smaller number is:
Group D 13/09/2022 (Afternoon)
(a) 5 : 11 (b) 11 : 5 (c) 12 : 7 (d) 7 : 12

Q.94. The ratio of Kamal's to Kiran's age is 4 : 5. Kamal will be 30 years old after 6 years. What is the present age of Kiran?
Group D 13/09/2022 (Evening)
(a) 28 years (b) 30 years
(c) 40 years (d) 24 years

Q.95. If 13 : 12 :: x : 60 then, the value of x is :
Group D 13/09/2022 (Evening)
(a) 91 (b) 65 (c) 78 (d) 56

Q.96. If $\frac{196}{0.196} = \frac{19.6}{n}$, then the value of n =_____.
Group D 14/09/2022 (Afternoon)
(a) 0.0196 (b) 0.00196 (c) 1.96 (d) 0.196

Q.97. If 2, 3, 8 and y are in proportion, find the value of y.
Group D 14/09/2022 (Evening)
(a) 48 (b) 12 (c) 24 (d) 16

Q.98. If 361 : y : : y : 121, and y > 0, then the value of y is:
Group D 15/09/2022 (Evening)
(a) 247 (b) 381 (c) 121 (d) 209

Q.99. if ₹$1,368$ is divided into two parts in the ratio of 5 : 3, then the amount (in Rs.) in the greater part is _____.
Group D 16/09/2022 (Morning)
(a) 855 .00 (b) 585.00
(c) 268.00 (d) 444.72

Q.100. If 14 : y :: 7 : 8, find the value of y.
Group D 16/09/2022 (Evening)
(a) 16 (b) 18 (c) 56 (d) 28

Q.101. If 16 : y :: y : 25, find the positive value of y.
Group D 17/09/2022 (Morning)
(a) 18 (b) 10 (c) 15 (d) 20

Q.102. The ratio of $9^{3.5} : 3^5$ is the same as:
Group D 17/09/2022 (Morning)
(a) 1 : 14 (b) 1 : 7 (c) 7 : 1 (d) 9 : 1

Q.103. An amount of ₹1,344 is divided among three persons in the ratio of 3 : 4 : 5. The difference between the largest and the smallest shares in the distribution is:
Group D 17/09/2022 (Morning)
(a) ₹224 (b) ₹236 (c) ₹248 (d) ₹260

Q.104. A company earns a profit that is distributed among the company's three partners in the ratio of 1 : 3 : 5. If the difference between the smallest and the largest shares is ₹80,000, the total profit of the company is:
Group D 17/09/2022 (Afternoon)
(a) ₹1,40,000 (b) ₹1,80,000

(c) ₹1,60,000 (d) ₹1,20,000

Q.105. Out of 162 students in a school, 72 are boys and the remaining are girls. What is the ratio of the number of girls to the number of boys in that school?
Group D 18/09/2022 (Morning)
(a) 5 : 6 (b) 5 : 4 (c) 4 : 5 (d) 6 : 5

Q.106. A sum of money is to be distributed among the partners A, B and C in the proportion of 3 : 2 : $1\frac{1}{3}$. If A gets ₹1,500 more than B, then C's share is:
Group D 18/09/2022 (Evening)
(a) ₹2,500 (b) ₹3,750 (c) ₹2,000 (d) ₹3,400

Q.107. If x ≠ y, z > 0, and $(x + z)^2$: $(y + z)^2$ :: x : y, then find a, where a > 0, such that x : a :: a : y.
Group D 19/09/2022 (Evening)
(a) $x^2 y^2$ (b) z (c) -z (d) x - y

Q.108. The ratio of marks obtained by A and B is 3 : 4 and of those obtained by B and C is 2 : 3. What is the ratio of marks obtained by A and C?
Group D 22/09/2022 (Afternoon)
(a) 2 : 1 (b) 1 : 1 (c) 1 : 2 (d) 4 : 3

Q.109. The ratio of A's salary to B's salary is 4 : 5. The ratio of B's salary to C's salary is 3 : 4. Find the ratio of A's salary to C's salary.
Group D 26/09/2022 (Evening)
(a) 3 : 5 (b) 4 : 5 (c) 4 : 3 (d) 5 : 4

Q.110. The ratio of boys and girls in a school that has 480 students is 7 : 9. What will be the ratio of boys and girls if 3 more girls are admitted to the school?
Group D 27/09/2022 (Morning)
(a) 9 : 7 (b) 7 : 9 (c) 10 : 13 (d) 13 : 10

Q.111. Two numbers are in the ratio 5 : 3 and the difference between these two numbers is 34. Find the smaller of the two numbers.
Group D 28/09/2022 (Afternoon)
(a) 21 (b) 85 (c) 31 (d) 51

Q.112. A number is split into two parts such that one part is 14 more than the other, and the ratio of the two parts is 7 : 5. Find the number.
Group D 29/09/2022 (Afternoon)
(a) 54 (b) 49 (c) 84 (d) 35

Q.113. Two numbers are in the ratio 5 : 7 If the sum of the numbers is 108, find the smaller number.
Group D 30/09/2022 (Afternoon)
(a) 42 (b) 47 (c) 36 (d) 45

Q.114. 20, 38, 40 and x are in proportion. Find the value of x.
Group D 30/09/2022 (Evening)
(a) 66 (b) 76 (c) 70 (d) 74

Q.115. A sum of ₹150 is divided into two parts. The first part is ₹2 more than three times the second part. Find the second part.
Group D 06/10/2022 (Morning)
(a) ₹37 (b) ₹35 (c) ₹115 (d) ₹113

Q.116. Two numbers a and b are such that a : 24 :: 24 : b, and a : b :: b : 192. Find the value of (a + b).
Group D 06/10/2022 (Afternoon)
(a) 48 (b) 72 (c) 54 (d) 60

Q.117. Ujwal has 5,250 in currency notes of denominations 50, 100 and 200. The number of notes of each denomination are equal. How many notes in total does Ujwal have ?
Group D 11/10/2022 (Morning)
(a) 30 (b) 60 (c) 45 (d) 15

Q.118. If i = $\frac{7}{3}$j and j = $\frac{4}{5}$k, then the ratio of i : j : k is:
Group D 11/10/2022 (Evening)
(a) 28 : 4 : 15 (b) 28 : 12 : 15
(c) 7 : 12 : 5 (d) 21 : 12 : 20

RRB NTPC CBT - 2
(09/05/2022 to 17/06/2022)

Q.119. If $\frac{2}{3}$ of y = $\frac{8}{15}$ of z, then find y : z.
Level 6 (09/05/2022) Shift 1
(a) 4 : 5 (b) 21 : 55 (c) 16 : 45 (d) 3 : 5

Q.120. When k > 0, is subtracted from each of 11, 15, 20 and 30, the numbers, so obtained in this order are in proportion. What is the mean proportional between (2k + 2) and $3k^2$?
Level 6 (09/05/2022) Shift 2
(a) 32 (b) 22 (c) 18 (d) 30

Q.121. Ram and Rahim together have ₹1210. If $\frac{1}{3}$ of Ram's money is equal to $\frac{2}{5}$ of Rahim's amount, then what is the amount (in ₹) that Rahim has ?
Level 4 (10/05/2022) Shift 1
(a) 660 (b) 650 (c) 560 (d) 550

Q.122. Sunit won $\frac{3}{5}$ of the marbles that were there in the beginning of the game . Ravi won $\frac{2}{3}$ of the remaining marbles while sunny won the remaining 60 marbles. How many marbles did sunita win ?
Level 5 (12/06/2022) Shift 1
(a) 240 (b) 285 (c) 270 (d) 255

Q.123. A stick was broken in two parts which have lengths in the ratio 7 : 11. If the length of the smaller part was 77 cm, find the length (m)of the unbroken stick.
Level 5 (12/06/2022) Shift 2
(a) 1.80 (b) 1.98 (c) 1.26 (d) 1.21

Q.124. John bought three items from a store. The price of item A was $\frac{2}{3}$ of the price of item B, while the price of item C was $\frac{3}{4}$ of the price of item B. If the price of item A was ₹88, then what was the price of item C?
Level 5 (12/06/2022) Shift 2
(a) ₹ 121 (b) ₹ 99 (c) ₹ 90 (d) ₹ 108

Q.125. If (x + 1) : (x + 5) :: (x + 17) : (x + 53) then what is the mean proportional between (x + 5) and (9x - 1) where x > 0 ?
Level 2 (13/06/2022) Shift 1
(a) $10\sqrt{2}$ (b) $3\sqrt{2}$ (c) $4\sqrt{13}$ (d) $4\sqrt{3}$

Q.126. The ratio of incomes of A and B is 5 : 7 and the ratio of their savings is 2 : 3. If A and B spend Rs 35,400 and Rs 48,600 respectively, then what is the difference(in rs) between the income of B and A ?
Level 3 (14/06/2022) Shift 1
(a) 17,600 (b) 20,000
(c) 18,600 (d) 18,000

Q.127. In an office the number of male employees is $\frac{3}{8}$ of the number of female employees. $\frac{1}{3}$ of the males are non-graduates, wherea $\frac{4}{9}$ of the females are non-graduates. If the number of non-graduate employees in the office is 164, then the total number of employees in the office is :
Level 3 (14/06/2022) Shift 2
(a) 396 (b) 288 (c) 360 (d) 414

Q.128. A sum of money is distributed by a father among his 4 sons A, B C, D in the ratio 3 : 6 : 8 : 5. After the distribution, it has been observed that the amount of money that C received is ₹1000 more than what B received. What is the total amount of money that has been distributed among the four ?
Level 3 (14/06/2022) Shift 2
(a) ₹13,000 (b) ₹12,450
(c) ₹12,000 (d) ₹11,000

Q.129. A pole is 405m long. It is painted in saffron, white and green colours one

above the other in the ratio 8 : 9 : 10 respectively. What is the length of the white part of the pole (in meters) ?
Level 2 (16/06/2022) Shift 1
(a) 140 (b) 130 (c) 120 (d) 135

Q.130. In a class of 80 students, $\frac{1}{10}th$ of the class like Chocolate D and $\frac{1}{20}th$ of the class likes Chocolate E. What is the difference between the number of students who like chocolate D and the number of students who like Chocolate E ?
Level 3 (17/06/2022) Shift 1
(a) 9 (b) 5 (c) 2 (d) 4

Q.131. The ratio of saving and expenditure of Kiran is 7 : 13 and his monthly income is ₹ 1,80,000. The savings are divided in the ratio of 4 : 3 between Mutual funds and Equity. What is the amount of money saved in the form of Mutual Funds ?
Level 3 (17/06/2022) Shift 2
(a) ₹ 36,000 (b) ₹ 45,000
(c) ₹ 39,000 (d) ₹ 63,000

Q.132. In a group of students, the number of girls is three-fourth of the number of boys. If two-third of the number of girls and one-half of the number of boys like mango juice, then what fraction of the total number of girls and boys like mango juice ?
Level 3 (17/06/2022) Shift 3
(a) $\frac{1}{7}$ (b) $\frac{4}{7}$ (c) $\frac{2}{7}$ (d) $\frac{3}{7}$

Q.133. Sachin and Sehwag together have ₹950. By taking ₹ 250 from Sehwag, Sachin will have the same amount as Sehwag already had. Find the ratio of the amounts that Sehwag and Sachin had initially.
Level 3 (17/06/2022) Shift 3
(a) 9 : 7 (b) 12 : 7 (c) 13 : 9 (d) 7 : 5

Q.134. 64 students of class 10 took part in mathematics quiz. If the number of girls was 16 more than the number of boys. Then find the ratio of the number of boys to the total number of students who took part in the quiz.
Level 3 (17/06/2022) Shift 3
(a) 3 : 8 (b) 4 : 9 (c) 5 : 8 (d) 3 : 5

RRB NTPC CBT - 1

(28/12/2020 to 31/07/2021)

Q.135. Out of Harish's monthly salary of Rs.45000 , $\frac{1}{3}$ of the expenditures are on education and $\frac{2}{6}$ of the expenditures are on food and other necessities. The rest of the salary goes towards his savings. The amount of savings is :
RRB NTPC 28/12/2020 (Morning)
(a) Rs. 22500 (b) Rs. 11250
(c) Rs. 12000 (d) Rs. 15000

Q.136. A rope is divided into three different parts. The first part is $\frac{1}{5}$ of the whole length, the second part is $\frac{3}{2}$ of the first. The third part is what fraction of the rope ?
RRB NTPC 28/12/2020 (Morning)
(a) $\frac{3}{4}$ (b) $\frac{2}{3}$ (c) $\frac{1}{3}$ (d) $\frac{1}{2}$

Q.137. The train fare, bus fare and air fare between 2 places are in the ratio 5 : 8 : 12, the number of passengers travelled by them is in the ratio 3 : 4 : 5 and the total fare collected on a particular day for these modes of transportation for a single trip is Rs.1,07,000. Find the total fare collected from the air passengers.
RRB NTPC 29/12/2020 (Morning)
(a) Rs. 80,000 (b) Rs. 60,000
(c) Rs. 70,000 (d) Rs. 65,000

Q.138. If A : B = 15 : 16, B : C = 8 : 25, C : D = 20 : 9, then find A : D.
RRB NTPC 29/12/2020 (Morning)
(a) 3 : 2 (b) 4 : 3 (c) 3 : 4 (d) 2 : 3

Q.139. If $\frac{x}{y} = \frac{4}{5}$, then $\frac{5x+7y}{5x-7y} + \frac{6x+4y}{7x-8y}$ is equal to :
RRB NTPC 29/12/2020 (Evening)
(a) $\frac{11}{3}$ (b) $-\frac{22}{3}$ (c) $\frac{3}{2}$ (d) $-\frac{5}{4}$

Q.140. In a game Rajesh lost $\frac{1}{3}$ of his money in the first round of the game, in the second round he losses $\frac{3}{5}$ of his remaining money and in the third round he lost $\frac{4}{7}$ of the rest. He is left with what part of the original sum of money ?
RRB NTPC 30/12/2020 (Morning)
(a) $\frac{4}{45}$ (b) $\frac{4}{35}$ (c) $\frac{2}{5}$ (d) $\frac{4}{15}$

Q.141. In a firm, the ratio of male to female officers is in the ratio 4 : 7. If 50 male officers and 100 female officers are shifted to another firm, then the ratio of male to female officers becomes 7 : 12. Find the number of male officers before shifting in the firms.
RRB NTPC 30/12/2020 (Evening)
(a) 450 (b) 300 (c) 500 (d) 400

Q.142. The ratio of incomes of Amar and Komal is 5 : 4, and the ratio of their expenditures is 2 : 1. If each of them saves Rs.6,000 per month. Find Amar's income.
RRB NTPC 04/01/2021 (Evening)
(a) Rs.10,000 (b) Rs.6,000
(c) Rs.12,000 (d) Rs.8,000

Q.143. For every 18 eggs that Noori buys, three eggs turn out to be rotten. At the same rate, how many good eggs will Noori have if she buys 690 eggs ?
RRB NTPC 04/01/2021 (Evening)
(a) 585 (b) 475 (c) 575 (d) 565

Q.144. In a school, the number of boys and girls were in the ratio 5 : 7 . Eight more boys were admitted during the session. The new ratio of girls and boys is 1 : 1 . In the beginning the difference between the number of boys and that of girls was :
RRB NTPC 07/01/2021 (Morning)
(a) 10 (b) 12 (c) 02 (d) 08

Q.145. A certain sum of money was divided among three friends: Rajeev, Kewal and Amit in the ratio of 2 : 3 : 7. If Amit's share is Rs 15 more than that of Kewal then what is the sum of money which was divided :
RRB NTPC 07/01/2021 (Evening)
(a) Rs.180 (b) Rs. 45 (c) Rs. 57 (d) Rs. 27

Q.146. Three friends arranged a party. Tanveer paid $\frac{2}{3}$ as much as Yusuf paid. Yusuf paid $\frac{1}{2}$ as much as Sachin paid. The fraction of the total expenditure by Yusuf was :
RRB NTPC 08/01/2021 (Morning)
(a) $\frac{2}{11}$ (b) $\frac{3}{11}$ (c) $\frac{7}{11}$ (d) $\frac{5}{11}$

Q.147. In a firm the ratio of male and female members was 4 : 5. The firm decided to increase the number of males by 80% and the number of female by 60%. What will be the new ratio of male members to female members in the firm?
RRB NTPC 08/01/2021 (Evening)
(a) 8 : 10 (b) 9 : 10 (c) 18 : 15 (d) 15 : 16

Q.148. Every month Sunil saves $\frac{2}{17}$ of his monthly salary of Rs 51,000. What amount does he save every month ?
RRB NTPC 10/01/2021 (Morning)
(a) Rs 1,020 (b) Rs 6,000
(c) Rs 5,100 (d) Rs 3,000

Q.149. The mean score of class A of 40 students in a mathematics test of 30 marks is 23. The mean score of class B of 45 students in the same test is 22. What is the ratio of mean scores of both the class to that of class A.
RRB NTPC 10/01/2021 (Evening)
(a) 382 : 391 (b) 380 : 391
(c) 390 : 382 (d) 391 : 382

Q.150. A, B and C entered into partnership. A invested 3 times as much as B and B invested $\frac{2}{3}$ times of what C invested. At the end of the year, the total profit was Rs.6600. B's share on the profit is :
RRB NTPC 10/01/2021 (Evening)
(a) Rs 2,400 (b) Rs 1,600
(c) Rs 1,800 (d) Rs 1,200

Q.151. Calculate the least whole number, which when subtracted from both the terms of the ratio 5 : 6 gives a ratio less than 17 : 22.
RRB NTPC 11/01/2021 (Morning)
(a) 3 (b) 5 (c) 2 (d) 4

Q.152. Ram Sagar and Bhagat Ram enter into a partnership by investing in the ratio 10 : 13. Find Bhagat Ram's share in a profit of Rs.8,050.
RRB NTPC 11/01/2021 (Evening)
(a) Rs. 4550 (b) Rs. 1550
(c) Rs. 4025 (d) Rs. 3500

Q.153. Anita and Vinnet divide an amount of Rs. 1,950 between themselves in the ratio 6 : 7. If an amount of Rs. 100 is added to each of their shares, what will be the new ratio of their shares ?
RRB NTPC 11/01/2021 (Evening)
(a) 20 : 23 (b) 106 : 107
(c) 600 : 700 (d) 900 : 1050

Q.154. If we increase 50% of the numerator and 80% of the denominator of a fraction, then what fraction of the original will be the new fraction ?
RRB NTPC 12/01/2021 (Morning)
(a) $\frac{7}{9}$ (b) $\frac{6}{5}$ (c) $\frac{5}{6}$ (d) $\frac{5}{8}$

Q.155. If A : B = 3 : 5 and B : C = 4 : 7,then the value of A : B : C is :
RRB NTPC 12/01/2021 (Evening)
(a) 12 : 35 : 20 (b) 3 : 5 : 7
(c) 20 : 12 : 5 (d) 12 : 20 : 35

Q.156. In a college, if 15% of the boys are the same in number as one - third of the girls, then find the ratio of the number of boys to that of girls in the college.
RRB NTPC 13/01/2021 (Evening)
(a) 20 : 7 (b) 7 : 20 (c) 20 : 9 (d) 9 : 20

Q.157. If a = $\frac{3}{7}$b , then the value of $\frac{8a-b}{2a+3b}$ is :
RRB NTPC 16/01/2021 (Evening)
(a) 17 (b) $\frac{21}{17}$ (c) $\frac{17}{2}$ (d) $\frac{17}{27}$

Q.158. If we increase 50% of numerator and 80% of denominator of a fraction , then what fraction of the original will be the new fraction ?
RRB NTPC 17/01/2021 (Morning)
(a) $\frac{6}{5}$ (b) $\frac{5}{6}$ (c) $\frac{5}{8}$ (d) $\frac{7}{9}$

Q.159. The ratio of income of Aamir to that of Ali is 5 : 3 and they expend in the ratio of 9 : 5 respectively. If Aamir saves Rs. 2,600 and Ali saves Rs. 1,800. Then their respective incomes are.
RRB NTPC 17/01/2021 (Morning)
(a) Rs.8000 : Rs.4800
(b) Rs.6000 : Rs.3600
(c) Rs.9000 : Rs.5400
(d) Rs.8500 : Rs.5100

Q.160. Two numbers are in the ratio 2 : 3 ; if 20 is added to 20% of the smaller number, it will be equal to 10% of the larger number plus 25. Then, the smaller number is _____.
RRB NTPC 17/01/2021 (Evening)
(a) 100 (b) 180 (c) 160 (d) 200

Q.161. If $\frac{1}{3}A = \frac{1}{4}B = \frac{1}{5}C$, then A : B : C = ?
RRB NTPC 18/01/2021 (Morning)
(a) 4 : 3 : 5 (b) $\frac{1}{3} : \frac{1}{4} : \frac{1}{5}$
(c) 3 : 4 : 5 (d) 5 : 4 : 3

Q.162. If $a^3 + b^3 : a^3 - b^3 = 185 : 158$ then a : b is = ?
RRB NTPC 18/01/2021 (Morning)
(a) 5 : 4 (b) 7 : 3 (c) 2 : 3 (d) 10 : 2

Q.163. Seats for Mathematics, Physics and Chemistry in a school are in the ratio of 7 : 8 : 9. There is a proposal to increase the seats by 30% , 40% and 50% respectively. What will be the ratio of increased seats ?
RRB NTPC 18/01/2021 (Evening)
(a) 91 : 112 : 135 (b) 35 : 37 : 91
(c) 112 : 91 : 135 (d) 135 : 112 : 91

Q.164. What is the least possible number which must be subtracted from 16, 19 and 23. So that the resulting numbers are in continued proportion ?
RRB NTPC 19/01/2021 (Morning)
(a) 1 (b) 9 (c) 8 (d) 7

Q.165. If $\frac{8}{15}$ members of the scout team are girls, then what is the ratio of girls to boys in the team ?
RRB NTPC 19/01/2021 (Evening)
(a) 7 : 8 (b) 15 : 7 (c) 7 : 15 (d) 8 : 7

Q.166. If $\frac{A}{4} = \frac{B}{5} = \frac{C}{6}$, then A : B : C is :
RRB NTPC 21/01/2021 (Morning)
(a) 4 : 5 : 6 (b) 5 : 6 : 4
(c) 4 : 6 : 5 (d) 4 : 8 : 9

Q.167. If a : b = 5 : 3 and b : c = 3 : 7 , then what will be the value of a : c ?
RRB NTPC 22/01/2021 (Evening)
(a) $\frac{3}{7}$ (b) $\frac{5}{7}$ (c) $\frac{15}{7}$ (d) $\frac{25}{7}$

Q.168. The number of girls in a class is seven times the number of boys. Which of the following numbers cannot represent the total number of children in the class ?
RRB NTPC 23/01/2021 (Morning)
(a) 8 (b) 52 (c) 72 (d) 48

Q.169. The ratio of the income of Barun and Anil is 12 : 13 and that of their expenditures is 10 : 13. Find the income of Barun and Anil, if they save Rs. 2100 and Rs. 1,300 respectively.
RRB NTPC 23/01/2021 (Evening)
(a) Rs. 5,550 and Rs. 4,560
(b) Rs. 4,550 and Rs. 3,550
(c) Rs. 5,000 and Rs. 2,000
(d) Rs. 6,600 and Rs. 7,150

Q.170. Two natural numbers are in the ratio of 6 : 8 and their product is 768. The smaller number is ?
RRB NTPC 23/01/2021 (Evening)
(a) 12 (b) 8 (c) 24 (d) 32

Q.171. If $x = \frac{y}{2}$ and $y = \frac{z}{6}$, then x : y : z is equal to :
RRB NTPC 27/01/2021 (Morning)
(a) 2 : 12 : 1 (b) 1 : 2 : 3
(c) 1 : 2 : 12 (d) 1 : 2 : 6

Q.172. What must be subtracted from each of the numbers 23, 40, 57 and 108 so that the remainders are in proportion ?
RRB NTPC 28/01/2021(Morning)
(a) 4 (b) 2 (c) 8 (d) 6

Q.173. In an army camp, there were provisions for 425 men for 30 days. However, 375 men attended the camp. How long did the provision last ?
RRB NTPC 28/01/2021(Morning)
(a) 30 days (b) 35 days
(c) 34 days (d) 32 days

Q.174. A certain sum of money is divided

among A, B and C. A gets one-third of the amount. B gets thrice as much as what C gets and C gets Rs. 1,200 less than what A gets. Find the share (in Rs.) of A.
RRB NTPC 30/01/2021 (Morning)
(a) 3,600 (b) 4,800 (c) 1,200 (d) 2,400

Q.175. A bag contains Rs 3,000, the notes of which are in the denomination of Rs 50 , Rs 100 and Rs10. If the notes of Rs 100, Rs 50 and Rs 10 are in the ratio of 5 : 8 : 10 , then the numbers of the notes of Rs 50 in the bag will be ?
RRB NTPC 30/01/2021 (Evening)
(a) 16 (b) 32 (c) 24 (d) 8

Q.176. The speeds of three cars are in the ratio of 5 : 6 : 10. The time taken by each of them to travel the same distance is in the ratio of :
RRB NTPC 30/01/2021 (Evening)
(a) 6 : 5 : 10 (b) 10 : 6 : 5
(c) 10 : 5 : 6 (d) 12 : 10 : 6

Q.177. If A : B = 1 : 3 , B : C = 5 : 4 and C : D = 2 : 3, then the value of A : B : C : D will be :
RRB NTPC 31/01/2021 (Evening)
(a) 4 : 9 : 12 : 16 (b) 3 : 8 : 9 : 12
(c) 4 : 12 : 18 : 20 (d) 5 : 15 : 12 : 18

Q.178. An amount of money is to be divided between A , B and C in the ratio 5 : 2 : 8 If the difference between the shares of A and C is Rs. 7,740 then what will be the total amount ?
RRB NTPC 31/01/2021 (Evening)
(a) Rs.28,976 (b) Rs.38,700
(c) Rs.35,875 (d) Rs.30,983

Q.179. If the length and perimeter of a rectangle are in the ratio 3 : 20 then its length and breadth are in ratio of :
RRB NTPC 31/01/2021 (Evening)
(a) 3 : 7 (b) 3 : 6 (c) 3 : 5 (d) 3 : 4

Q.180. Income and expenditure of a person are in the ratio of 9 : 5. If the income of the person is Rs.27,000 , then find his savings.
RRB NTPC 01/02/2021 (Morning)
(a) Rs.12,000 (b) Rs.13,564
(c) Rs.9,678 (d) Rs.10,000

Q.181. Find the smallest of three positive numbers if the numbers are in ratio of 3 : 7 : 8 and the sum of their squares is 7808.
RRB NTPC 01/02/2021 (Morning)
(a) 30 (b) 24 (c) 27 (d) 36

Q.182. What is the compound ratio of 45 : 75, 3 : 5, 51 : 68 and 256 : 81 ?
RRB NTPC 01/02/2021 (Evening)
(a) $\frac{64}{75}$ (b) $\frac{128}{75}$ (c) $\frac{75}{32}$ (d) $\frac{32}{45}$

Q.183. If a : b :: 3 : 4 then the value of expression $\frac{5a-3b}{7a+2b}$ is :
RRB NTPC 01/02/2021 (Evening)
(a) $\frac{3}{29}$ (b) $\frac{29}{3}$ (c) $\frac{7}{29}$ (d) $\frac{7}{3}$

Q.184. The speeds of three trains are in the ratio 2 : 3 : 5 . The amount of time taken by these trains to travel the same distance is in the ratio :
RRB NTPC 02/02/2021 (Morning)
(a) $\frac{1}{2}:\frac{1}{3}:\frac{1}{5}$ (b) 6 : 12 : 18
(c) 2 : 3 : 4 (d) 2 : 3 : 5

Q.185. If x : y = 4 : 3, then the value of $x^3 - y^3 : x^3 + y^3$ *is* :
RRB NTPC 04/02/2021 (Morning)
(a) 36 : 91 (b) 38 : 91
(c) 39 : 91 (d) 37 : 91

Q.186. 35% of a number is the same as 30% of another number. Find the ratio of the first number to the second number.
RRB NTPC 04/02/2021 (Evening)
(a) 7 : 9 (b) 6 : 7 (c) 5 : 7 (d) 8 : 9

Q.187. The sum of two numbers is 80 and their difference is 8. The ratio of the first number to the second number will be ?
RRB NTPC 04/02/2021 (Evening)
(a) 11 : 9 (b) 13 : 9 (c) 12 : 11 (d) 13 : 11

Q.188. John, Sarah, Tom and Joane bought 3 pizzas of the same size in all. John ate $\frac{2}{4}$ of a pizza. Sarah, Tom and Joane ate $\frac{3}{4}$ of a pizza each. How much pizza was left ?
RRB NTPC 05/02/2021 (Morning)
(a) $\frac{1}{2}$ of a pizza (b) $\frac{1}{4}$ of a pizza
(c) $\frac{3}{4}$ of a pizza (d) 1 pizza

Q.189. Rs 110 are contained in a box which consist of one rupee, 50 paise and 25 paise coins in the ratio 1 : 2 : 3 . What is the number of 50 paise coins ?
RRB NTPC 08/02/2021 (Morning)
(a) 79 (b) 77 (c) 80 (d) 78

Q.190. How much should we add to each of 7 and 9 so that the ratio of the two numbers thus formed is 13 : 14.
RRB NTPC 08/02/2021 (Morning)
(a) 16 (b) 19 (c) 17 (d) 18

Q.191. If a : b = 3 : 4 and d : b = 4 : 3, then find the ratio of a to d.
RRB NTPC 08/02/2021 (Evening)
(a) 3 : 4 (b) 9 : 16 (c) 16 : 9 (d) 4 : 3

Q.192. Maddy reads three - fifth of a chapter consisting of 75 pages. How many more pages does he need to read to complete the chapter ?
RRB NTPC 08/02/2021 (Evening)
(a) 15 (b) 25 (c) 20 (d) 30

Q.193. The ratio of A's salary to that of B's salary is 4 : 5. A's salary got increased by 10% and B's salary got increased by 20%. What is the ratio of A's salary to that of B now ?
RRB NTPC 08/02/2021 (Evening)
(a) 15 : 14 (b) 11 : 14
(c) 14 : 11 (d) 11 : 15

Q.194. Two - Fifth of one-fourth of three - seventh of a number is 15. What is the half of that number ?
RRB NTPC 09/02/2021 (Morning)
(a) 175 (b) 300 (c) 170 (d) 375

Q.195. The ratio of the velocities of the hour hand and minute hand of a clock is :
RRB NTPC 09/02/2021 (Morning)
(a) 1 : 1 (b) 1 : 12 (c) 5 : 1 (d) 12 : 1

Q.196. There are 500 students in a school. The boys and the girls are in the ratio 7 : 3. If 120 new girls are enrolled in the school, then what will be the ratio of the number of boys to that of girls ?
RRB NTPC 09/02/2021 (Evening)
(a) 35 : 27 (b) 35 : 29
(c) 35 : 28 (d) 35 : 26

Q.197. If X : Y = 4 : 5, Y : Z = 5 : 7 and Z : W = 7 : 9 , then X : W is equal to :
RRB NTPC 09/02/2021 (Evening)
(a) 4 : 9 (b) 3 : 7 (c) 2 : 9 (d) 3 : 11

Q.198. By how much should each term of the ratio 17 : 21 be reduced so that it becomes 7 : 9 ?
RRB NTPC 09/02/2021 (Evening)
(a) 3 (b) 2 (c) 5 (d) 4

Q.199. If 10% of m is the same as 20% of n, then m : n will be equal to :
RRB NTPC 10/02/2021 (Morning)
(a) 2 : 1 (b) 3 : 1 (c) 1 : 1 (d) 1 : 2

Q.200. Some one rupee, 50 P and 25 P coins make up Rs. 93.75 and the respective numbers of coins of each type are in the ratio 3 : 4 : 5. Find the number of coins of each type respectively.
RRB NTPC 10/02/2021 (Morning)
(a) 34,38 and 47 (b) 45, 60 and 75
(c) 54, 60 and 47 (d) 40, 60 and 57

Q.201. A boy read $\frac{3}{8}$ of a book in one

day and $\frac{4}{5}$ of the remainder on another day. If there were 30 pages unread, how many pages did the book contain ?
RRB NTPC 10/02/2021 (Morning)
(a) 380 (b) 209 (c) 200 (d) 240

Q.202. In a class the ratio of boys to girls was 5 : 7 . If there were 6 more girls than boys, find the total number of students in the class.
RRB NTPC 10/02/2021 (Morning)
(a) 48 (b) 60 (c) 24 (d) 36

Q.203. If $\frac{a}{2} = \frac{b}{3} = \frac{c}{5}$ then find $\frac{a+b+c}{c}$.
RRB NTPC 10/02/2021 (Evening)
(a) 2 (b) 10 (c) 12 (d) 5

Q.204. The sum of half, one-third and one - fifth of a number exceeds the number by 12. What is the number ?
RRB NTPC 10/02/2021 (Evening)
(a) 360 (b) 444 (c) 122 (d) 144

Q.205. If $\frac{1}{8}$ of a pencil is black, half of the remaining pencil is yellow and the remaining $3\frac{1}{2}$ cm of the pencil is blue, then what is the total length of the pencil ?
RRB NTPC 11/02/2021 (Morning)
(a) 3 cm (b) 2 cm (c) 8 cm (d) 4 cm

Q.206. Are the numbers 30, 40, 45 and 60 in proportion ?
RRB NTPC 11/02/2021 (Morning)
(a) Yes, they are in proportion
(b) No, they are not in proportion
(c) Only 30 and 40 are in proportion
(d) Only 45 and 40 are not in proportion.

Q.207. A started a business with a capital of Rs. 15000, B joined him after 2 months with a capital of Rs. 20,000. The ratio in which the profit at the end of the year divided between A and B is :
RRB NTPC 12/02/2021 (Morning)
(a) 8 : 9 (b) 9 : 8 (c) 9 : 10 (d) 10 : 9

Q.208. One fourth part of a pencil is black. Half of the remaining part is green and the rest of the pencil is yellow. If the length of the yellow part is $1\frac{1}{2}cm$, then find the length of the pencil.
RRB NTPC 15/02/2021 (Morning)
(a) 5 cm (b) 4 cm (c) 6 cm (d) 7 cm

Q.209. If 25% of first number is three times 50% of second number then what is the ratio of the first number to the second number ?
RRB NTPC 15/02/2021 (Morning)
(a) 6 : 1 (b) 2 : 3 (c) 3 : 1 (d) 1 : 6

Q.210. The ratio of two numbers is 4 : 5 . If 6 is added to both the numbers, then their ratio becomes 6 : 7. Find the smallest original number (before addition).
RRB NTPC 15/02/2021 (Morning)
(a) 24 (b) 12 (c) 6 (d) 7

Q.211. Gold and Silver are melted together in the ratio 8 : 12. If 30 Kg of Gold is melted then find the weight of the melted mixture ?
RRB NTPC 15/02/2021 (Evening)
(a) 75 kg (b) 60 kg (c) 58 kg (d) 70 kg

Q.212. If (m + n) : (m - n) = 7 : 3 , then (m^3 + n^3) : (m^3 - n^3) = ?
RRB NTPC 16/02/2021 (Evening)
(a) 117 : 133 (b) 133 : 117
(c) 17 : 133 (d) 117 : 13

Q.213. A, B and C completed a job costing Rs. 1800. A worked for 6 days , B worked for 4 days and C worked for 9 days. If their daily wages are in the ratio of 5 : 6 : 4 , then how much will A get paid ?
RRB NTPC 17/02/2021 (Morning)
(a) Rs. 800 (b) Rs. 600
(c) Rs. 400 (d) Rs. 1000

Q.214. Sundari, Kasu and Jyothi took two tests each. The ratio of marks obtained to total marks for each of their two tests is given below.
Sundari - $\frac{24}{60}$ and $\frac{32}{40}$
Kasu - $\frac{35}{70}$ and $\frac{54}{60}$
Jyothi - $\frac{27}{90}$ and $\frac{45}{50}$

Who among them registered the maximum progress ?
RRB NTPC 17/02/2021 (Morning)
(a) Both Sundari and Kasu
(b) Only Jyothi
(c) Only Kasu
(d) Only Sundari

Q.215. If three numbers are in the ratio of 4 : 3 : 8 and the smallest of these numbers is 42, find the highest of these numbers.
RRB NTPC 17/02/2021 (Evening)
(a) 104 (b) 96 (c) 120 (d) 112

Q.216. 36% of x = 81% of y. Find x : y.
RRB NTPC 17/02/2021 (Evening)
(a) 4 : 9 (b) 9 : 4 (c) 9 : 25 (d) 81 : 100

Q.217. Two numbers are in the ratio 9 : 5. If 9 is added to the greater number and 5 is subtracted from the smaller number , the greater number becomes thrice the smaller one. Find the number.
RRB NTPC 22/02/2021 (Morning)
(a) 36, 20 (b) 72, 40 (c) 18, 10 (d) 36, 10

Q.218. If $\frac{1}{3}$ of A = $\frac{3}{4}$ of B = $\frac{1}{6}$ of C , then what is A : B : C ?
RRB NTPC 23/02/2021 (Morning)
(a) 4 : 9 : 18 (b) 9 : 18 : 4
(c) 9 : 4 : 18 (d) 18 : 9 : 4

Q.219. Some fruits were divided between A, B, C and D in the ratio 3 : 4 : 5 : 7. If A got 192 fruits, then how many fruits did B and C together get ?
RRB NTPC 23/02/2021 (Morning)
(a) 756 (b) 576 (c) 675 (d) 567

Q.220. If a and b are of the same sign and ($3a^2$ - $8b^2$) : (a^2 + $4b^2$) = 2 : 1 then a : b = ?
RRB NTPC 27/02/2021 (Morning)
(a) 5 : 4 (b) 1 : 4 (c) 4 : 5 (d) 4 : 1

Q.221. An amount of Rs 50 is divided among A, B and C such that A gets Rs.5 more than B and B gets Rs. 9 more than C. What is the ratio of their shares ?
RRB NTPC 27/02/2021 (Evening)
(a) 23 : 18 : 9 (b) 23 : 14 : 13
(c) 14 : 23 : 14 (d) 13 : 24 : 13

Q.222. Two numbers are in the ratio of 9 : 11. If 4 is subtracted from each of the numbers, then their ratio becomes 7 : 9. The sum of these two number is :
RRB NTPC 01/03/2021 (Morning)
(a) 45 (b) 40 (c) 35 (d) 30

Q.223. If 1.2 : y :: 3.6 : 4.8 , then find the value of y.
RRB NTPC 01/03/2021 (Evening)
(a) y = $\frac{8}{5}$ (b) y = $\frac{5}{8}$ (c) y = $\frac{7}{5}$ (d) y = $\frac{4}{5}$

Q.224. The students in three classes are in the ratio 2 : 3 : 5. If 30 students are increased in each class the ratio changes to 4 : 5 : 7. The total number of students after the increase is.
RRB NTPC 02/03/2021 (Morning)
(a) 150 (b) 240 (c) 180 (d) 210

Q.225. What should be added to each term of the ratio 7 : 11 to make it equal to 4 : 5 ?
RRB NTPC 02/03/2021 (Evening)
(a) 16 (b) 9 (c) 11 (d) 18

Q.226. If the income of A is 15% more than that of B and the income of B is 20% less than that of C, then the incomes of A, B and C respectively are in the ratio.
RRB NTPC 02/03/2021 (Evening)

(a) 23 : 20 : 25 (b) 25 : 23 : 20
(c) 20 : 23 : 25 (d) 23 : 25 : 20

Q.227. If 0.02x = 0.5y , then find the value of $\frac{x-y}{x+y}$ is ___.
RRB NTPC 03/03/2021 (Morning)
(a) $\frac{13}{12}$ (b) $\frac{11}{12}$ (c) $\frac{12}{13}$ (d) $\frac{11}{13}$

Q.228. A class consists of 60 students with the ratio of girls to boys as 5 : 7. If 5 boys leave the class, the ratio of boys to girls would become.
RRB NTPC 03/03/2021 (Morning)
(a) 6 : 5 (b) 5 : 6 (c) 5 : 7 (d) 7 : 5

Q.229. The sum of 3% of a number and 2% of the other number is equal to $\frac{3}{4}$ of the sum of 3% of the first number and 5% of the second number. The ratio of the 1st Number to 2nd number is.
RRB NTPC 03/03/2021 (Morning)
(a) 3 : 5 (b) 3 : 7 (c) 7 : 3 (d) 3 : 4

Q.230. If A = $\frac{2}{3}$ B and B = $\frac{1}{3}$ C , then find the value of A : B : C is _____.
RRB NTPC 03/03/2021 (Morning)
(a) 1 : 3 : 9 (b) 3 : 9 : 2
(c) 2 : 3 : 9 (d) 9 : 3 : 2

Q.231. If A exceeds B by 25% and B is less than C by 30% , than the ratio of A and C is :
RRB NTPC 04/03/2021 (Morning)
(a) 7 : 8 (b) 4 : 5 (c) 8 : 7 (d) 3 : 2

Q.232. The product of two positive numbers is 0.60. If one number is $\frac{1}{15}$ th of the other , then what are the two numbers ?
RRB NTPC 04/03/2021 (Morning)
(a) 0.6, 1.0 (b) 0.4, 1.5
(c) 0.2, 3.0 (d) 0.3, 2.0

Q.233. A and B entered into a partnership investing Rs. 20,000/- and Rs. 16,000/- , respectively. After 3 months, C joined them with an investment of Rs. 15,000/- . What is B's share (in Rs.) if the half yearly profit is Rs. 4,350/- ?
RRB NTPC 04/03/2021 (Evening)
(a) Rs.1,600 (b) Rs.1,760
(c) Rs. 2,000 (d) Rs.1,850

Q.234. The product of two numbers is 64 and their sum is 20. If the first number is greater than the second number, then the ratio of the two numbers is :
RRB NTPC 05/03/2021 (Morning)
(a) 5 : 16 (b) 16 : 5 (c) 1 : 4 (d) 4 : 1

Q.235. If x : y = 2 : 3 , then (4x + 3y) : (2x + 5y) = ?
RRB NTPC 05/03/2021 (Morning)
(a) 17 : 19 (b) 19 : 17
(c) 13 : 11 (d) 11 : 13

Q.236. If 5A - 2B = 0 and 4B - 5C = 0 , then C : A = ?
RRB NTPC 05/03/2021 (Morning)
(a) 2 : 1 (b) 6 : 4 (c) 1 : 2 (d) 4 : 6

Q.237. If $\frac{a}{3} = \frac{b}{4} = \frac{c}{7}$, then $\frac{a+b+c}{c}$ is equal to :
RRB NTPC 05/03/2021 (Evening)
(a) 4 (b) 1 (c) 3 (d) 2

Q.238. If 10% of x = 15% of y , then what will be the value of x : y ?
RRB NTPC 05/03/2021 (Evening)
(a) 1 : 2 (b) 2 : 1 (c) 3 : 2 (d) 2 : 3

Q.239. What decimal of an hour is a second ?
RRB NTPC 05/03/2021 (Evening)
(a) 0.027 (b) 0.00027 (c) 0.0027 (d) 0.27

Q.240. 2 Chairs and 1 table cost Rs. 880, while 1 chair and 2 tables cost Rs. 980. Find the cost of each.
RRB NTPC 07/03/2021 (Morning)
(a) Rs.280 and Rs.380
(b) Rs.185 and Rs.285
(c) Rs.260 and Rs.360
(d) Rs.195 and Rs.295

Q.241. A is twice as fast as B and B is thrice as fast as C. The journey covered by C in 54 minutes will be covered by A in how many minutes ?
RRB NTPC 07/03/2021 (Morning)
(a) 30 min (b) 27 min (c) 18 min (d) 9 min

Q.242. If Rs. 825 is divided into three parts in a proportion of $\frac{1}{3} : \frac{4}{9} : \frac{3}{4}$, then the first part will be :
RRB NTPC 08/03/2021 (Morning)
(a) Rs.190 (b) Rs.204
(c) Rs.180 (d) Rs.210

Q.243. A and B entered into a partnership investing Rs.20,000 and 16000 respectively. After 3 months, C joined them with an investment of Rs.15000. What will be B's share in a half yearly profit of Rs.4100 ?
RRB NTPC 08/03/2021 (Morning)
(a) Rs.1681.56 (b) Rs.1508.04
(c) Rs.1200.68 (d) Rs.1428.56

Q.244. When a bar graph is drawn to the scale 1cm = 20 units, the value represented by a rectangle of height 4.7 cm is :
RRB NTPC 09/03/2021 (Morning)
(a) 96 units (b) 95 units
(c) 94 units (d) 98 units

Q.245. If $\frac{a}{b} = \frac{4}{3}$, then what will be the value of $\frac{6a+2b}{4a-2b}$?
RRB NTPC 09/03/2021 (Morning)
(a) 5 (b) 4 (c) 6 (d) 3

Q.246. Find the mean proportional between 169 and 121.
RRB NTPC 09/03/2021 (Morning)
(a) 179 (b) 143 (c) 147 (d) 165

Q.247. If 50% of x is the same as 25% of y , then x : y is equal to :
RRB NTPC 09/03/2021 (Morning)
(a) 3 : 2 (b) 2 : 1 (c) 2 : 3 (d) 1 : 2

Q.248. Two numbers are in the ratio of 2 : 3. If each number increased by 20, the ratio becomes 3 : 4. The Numbers are :
RRB NTPC 09/03/2021 (Morning)
(a) 40,60 (b) 20,25 (c) 30,40 (d) 20,30

Q.249. Rakesh has coins in the denominations of only Rs. 2 and Rs. 5 with him. If the total number of coins that he has is 60 and the amount of money with him Rs. 240 , then find the number of Rs. 2 and Rs. 5 coins respectively.
RRB NTPC 11/03/2021 (Morning)
(a) 10 and 50 (b) 20 and 40
(c) 15 and 45 (d) 25 and 35

Q.250. From a group of boys and girls, if 12 girls leave the group, then the ratio of boys to girls is 2 : 1. After this, if 30 boys leave the group, then the ratio of girls to boys becomes 3 : 1. Find the initial number of boys and girls in the group.
RRB NTPC 11/03/2021 (Evening)
(a) 34 boys and 35 girls
(b) 38 boys and 25 girls
(c) 40 boys and 20 girls
(d) 36 boys and 30 girls

Q.251. A tailor makes 6 pieces out of 1 m of cloth. If he has 33.5 m of cloth, then how many pieces can he make out of this cloth ?
RRB NTPC 11/03/2021 (Evening)
(a) 196 (b) 95 (c) 201 (d) 5.6

Q.252. What is the mean proportional between $8 + 3\sqrt{3}$ and $16 - 6\sqrt{3}$?
RRB NTPC 12/03/2021 (Morning)
(a) $\sqrt{54}$ (b) $\sqrt{48}$ (c) $\sqrt{74}$ (d) $\sqrt{128}$

Q.253. If the cost of a car and a bike are in the ratio of 3 : 2 and the cost of the car is Rs.15000 more than the bike, then find the cost (in Rs) of the bike.
RRB NTPC 12/03/2021 (Evening)

(a) 32,000 (b) 30,000
(c) 24,000 (d) 20,000

Q.254. If x : y = 3 : 5 , then the value of $\frac{5x-3y}{10x+6y}$ is :
RRB NTPC 13/03/2021 (Morning)
(a) 1 (b) 2 (c) 0 (d) - 1

Q.255. If $\frac{a}{b} = \frac{3}{2}$ and $\frac{b}{c} = \frac{3}{5}$, then the value of $\frac{a+b}{b+c}$ is :
RRB NTPC 13/03/2021 (Morning)
(a) $\frac{9}{11}$ (b) $\frac{15}{16}$ (c) $\frac{6}{11}$ (d) $\frac{5}{16}$

Q.256. If $\frac{a}{b} = 0.75$, then the value of $\frac{2a+b}{2a-b} + \frac{4}{9}$ is :
RRB NTPC 13/03/2021 (Morning)
(a) $\frac{41}{9}$ (b) $\frac{43}{9}$ (c) $\frac{47}{9}$ (d) $\frac{49}{9}$

Q.257. If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d}$, then $\frac{b^3+c^3+d^3}{a^3+b^3+c^3}$ will be equal to :
RRB NTPC 14/03/2021 (Morning)
(a) $\frac{d}{a}$ (b) $\frac{a}{d}$ (c) $\frac{d}{c}$ (d) $\frac{b}{d}$

Q.258. If 2.5x = 0.05y , then $\frac{y-x}{y+x} = ?$
RRB NTPC 14/03/2021 (Morning)
(a) $\frac{49}{50}$ (b) $\frac{49}{51}$ (c) $\frac{19}{50}$ (d) $\frac{19}{51}$

Q.259. 2 men and 3 women can earn Rs. 49 in 7 days. 3 men and 6 women can earn Rs. 96 in 8 days. In what time 1 man and 1 woman earn Rs. 27 ?
RRB NTPC 14/03/2021 (Morning)
(a) 9 days (b) 7 days
(c) 10 days (d) 8 days

Q.260. Rama packs 36 boxes in 1 h. Her sister needs 3 h to pack the same number. How much time will they together take to pack these 36 boxes ?
RRB NTPC 14/03/2021 (Morning)
(a) 40 min (b) 38 min
(c) 42 min (d) 45 min

Q.261. The ratio of the income of A to B is 5 : 4, and the ratio of their respective expenditure is 3 : 2. If, at the end of the year, each saves Rs. 1600 , then the income of A is.
RRB NTPC 14/03/2021 (Evening)
(a) Rs. 4400 (b) Rs. 3600
(c) Rs. 4000 (d) Rs. 3400

Q.262. Divide Rs.1,162 among A , B and C in the ratio of 35 : 28 : 20.
RRB NTPC 14/03/2021 (Evening)
(a) A = Rs.512 , B = Rs.385 and C = Rs. 265
(b) A = Rs.490 , B = Rs.392 and C = Rs.280
(c) A = Rs 512 , B = Rs.365 and C = Rs.285
(d) A = Rs.450 , B = Rs.425 and C = Rs.327

Q.263. If p : q = 9 : 2 , then find the ratio (4p + 7q) : (4p - 7q) .
RRB NTPC 15/03/2021 (Morning)
(a) 11 : 6 (b) 11 : 13 (c) 25 : 11 (d) 50 : 13

Q.264. If A : B = 2 : 3 , B : C = 2 : 3 and C : D = 3 : 4 , then A : D = ?
RRB NTPC 15/03/2021 (Evening)
(a) 3 : 1 (b) 2 : 4 (c) 1 : 3 (d) 1 : 2

Q.265. 40% of the first number is 12 and 50% of the second number is 24. The ratio of the first number to the second number is.
RRB NTPC 15/03/2021 (Evening)
(a) 4 : 5 (b) 8 : 5 (c) 1 : 2 (d) 5 : 8

Q.266. The ratio of three positive numbers is 1 : 3 : 4 and the sum of their squares is 2106. What is the largest of these three numbers ?
RRB NTPC 19/03/2021 (Morning)
(a) 36 (b) 44 (c) 40 (d) 32

Q.267. Rs. 2430 is divided among three persons A, B and C such that if their shares are diminished by Rs. 5, Rs. 10 and Rs. 15 respectively, the remainders shall be in the ratio 3 : 4 : 5. Find the share of C.
RRB NTPC 21/03/2021 (Morning)
(a) Rs.810 (b) Rs.1250
(c) Rs.1015 (d) Rs.605

Q.268. Mohit has an amount of Rs.13,000 in the denominations of ten-rupee notes, twenty-rupee notes, fifty-rupee notes and five-hundred-rupee notes. The number of five-hundred-rupee notes is 25% of the number of ten-rupee notes. The number of fifty-rupee notes is 50% of the number of ten - rupee notes.The number of twenty-rupee is 50% of the number of five-hundred -rupee notes. What is the total number of notes that Mohit has ?
RRB NTPC 21/03/2021 (Morning)
(a) 200 (b) 150 (c) 250 (d) 100

Q.269. The total number of gold medals and silver medals won by a person in games is 75. Which of the following CANNOT be the ratio of the number of silver medals won to that of gold medals won by that person ?
RRB NTPC 21/03/2021 (Evening)
(a) 2 : 3 (b) 7 : 8 (c) 9 : 1 (d) 12 : 13

Q.270. The incomes of A and B are in the ratio 3:2 and their expenditures are in the ratio 5 : 3. If each saves Rs. 2,000, what will be the difference between their incomes ?
RRB NTPC 27/03/2021 (Morning)
(a) Rs. 4,000 (b) Rs. 6,000
(c) Rs. 5,000 (d) Rs. 8,000

Q.271. Two numbers are in the ratio 3 : 2. If 8 and 6 are subtracted from the first and the second number respectively, the ratio becomes 8 : 5. The numbers are :
RRB NTPC 01/04/2021 (Morning)
(a) 3, 2 (b) 24, 16 (c) 40, 30 (d) 32, 24

Q.272. Two friends received a bonus of Rs. 2,000 each in their bank accounts. They already have Rs. 47,000 and Rs. 54,000 in their respective bank accounts. Ratio of the amounts in their respective accounts will be :
RRB NTPC 01/04/2021 (Morning)
(a) 7 : 8 (b) 47 : 56 (c) 49 : 54 (d) 47 : 54

Q.273. The ratio of A to B is x : 12 and the ratio of B to C is 4 : y. If the ratio of A to C is 5 : 3 , then x : y is _____.
RRB NTPC 01/04/2021 (Evening)
(a) 5 : 1 (b) 5 : 3 (c) 3 : 5 (d) 3 : 1

Q.274. At a party , the ratio of men to women is 4 : 3. If there are 84 men , then how many women are at the party ?
RRB NTPC 01/04/2021 (Evening)
(a) 36 (b) 42 (c) 63 (d) 53

Q.275. If Rs.1,313 is divided into three parts proportional to $\frac{1}{3} : \frac{3}{5} : \frac{3}{4}$, then the second part is _____.
RRB NTPC 03/04/2021 (Morning)
(a) Rs.468 (b) Rs.585
(c) Rs.360 (d) Rs.260

Q.276. A bag contains 50 paise, 25 paise and 10 paise coins in the ratio 9 : 5 : 6 amounting to Rs. 317.5. Find the number of coins of 25 paise.
RRB NTPC 03/04/2021 (Morning)
(a) 300 (b) 450 (c) 250 (d) 600

Q.277. Rs.1,540 are divided among A , B , C such that A receives $\frac{2}{9}$ of what B and C receive together ; and B gets $\frac{3}{11}$ of what A and C get together. Find the share of C.
RRB NTPC 03/04/2021 (Evening)
(a) Rs.920 (b) Rs.900
(c) Rs.850 (d) Rs.930

Q.278. When Rs.391 is divided into three parts proportional to the fractions $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}$ then what will be the smallest part ?
RRB NTPC 03/04/2021 (Evening)
(a) Rs.102 (b) Rs.120
(c) Rs.153 (d) Rs.136

Q.279. If 1.75 : x : : 5 : 8 , then the value of x is :
RRB NTPC 05/04/2021 (Morning)
(a) 2 (b) 2.5 (c) 2.8 (d) 2.2

Q.280. The third proportional to 4 and 9 is:
RRB NTPC 05/04/2021 (Morning)
(a) 81 (b) $20\frac{1}{4}$ (c) 36 (d) 16

Q.281. The compound ratio of 1 : 2 , 3 : 10 and 10 : 21 is :
RRB NTPC 05/04/2021 (Morning)
(a) 1 : 7 (b) 7 : 1 (c) 14 : 1 (d) 1 : 14

Q.282. The ratio of the incomes of two persons is 7 : 5 and that of their respective expenditures is 9 : 7. Find the respective income of each person if they save Rs.1,700 and Rs. 1,100 respectively.
RRB NTPC 05/04/2021 (Evening)
(a) Rs.5,000, Rs.2,000
(b) Rs.5,500, Rs.4,500
(c) Rs.4,500, Rs.3,500
(d) Rs.3,500, Rs.2,500

Q.283. If a : b = c : d = e : f = g : h = 1 : 3 , then what will be the value of the following :
(pa + qc + re + sg) : (pb + qd + rf + sh)
RRB NTPC 05/04/2021 (Evening)
(a) 1 : 5 (b) 1 : 2 (c) 1 : 3 (d) 1 : 4

Q.284. If a : b = 2 : 5 , b : c = 5 : 8 , c : d = 8 : 11 , then a : d is :
RRB NTPC 06/04/2021 (Morning)
(a) 3 : 5 (b) 5 : 8 (c) 2 : 11 (d) 2 : 7

Q.285. If among four numbers, the second is thrice of the first, the third is four times the second, the fourth is five times the third, and the mean of the four numbers is 1900, then the smallest number is :
RRB NTPC 06/04/2021 (Morning)
(a) 6000 (b) 1200 (c) 50 (d) 100

Q.286. John and Joseph have Rs.19,000 and Rs.26,000 respectively with them. If Joseph gives Rs. 1,000 to John, then the ratio of the amount with John and that with Joseph is :
RRB NTPC 06/04/2021 (Evening)
(a) 19 : 26 (b) 2 : 3 (c) 20 : 27 (d) 4 : 5

Q.287. 65% of the first number is 130 and 40% of the second number is 100. The ratio of the first number to the second number is :
RRB NTPC 06/04/2021 (Evening)
(a) 5 : 8 (b) 1 : 2 (c) 4 : 5 (d) 8 : 5

Q.288. The ratio of the sum of money Arun And Ahaan had is 9:5. If Arun gives Rs. 12 from his share to Ahaan , then the ratio will change to 4 : 3. How much money did Arun have initially ?
RRB NTPC 07/04/2021 (Evening)
(a) Rs.90 (b) Rs.144 (c) Rs.108 (d) Rs.126

Q.289. $\frac{3}{5}$ of a number is 10 more than $\frac{1}{2}$ of the second number. If 8 is subtracted from $\frac{3}{7}$ of the first number, then it becomes 4 less than $\frac{1}{2}$ of the second number. What is the sum of the two numbers ?
RRB NTPC 08/04/2021 (Evening)
(a) 56 (b) 55 (c) 54 (d) 57

Q.290. The difference between two numbers which are in the ratio 5 : 3 is 50. What is the product of the numbers ?
RRB NTPC 08/04/2021 (Evening)
(a) 9375 (b) 1035 (c) 9975 (d) 8575

Q.291. If $\frac{3}{5}$ of a bottle is filled , what is the ratio of the filled part to the empty part of the bottle ?
RRB NTPC 23/07/2021 (Morning)
(a) 3 : 2 (b) 5 : 3 (c) 2 : 3 (d) 3 : 5

Q.292. $\frac{6}{11}$ of the people present in a hall are sitting in $\frac{9}{14}$ of the chair available and the rest are standing. If there are 30 empty chairs, how many people in the hall are standing ?
RRB NTPC 23/07/2021 (Morning)
(a) 40 (b) 30 (c) 45 (d) 35

Q.293. Radha and Vetsal invested Rs 36,000 and Rs 42,000 respectively, in a business. Radha, being an active partner, got Rs 637.50 extra every month for running the business. In 3 years, If Radha received a total of Rs 31,500. Then what was the profit earned by Vatsal during this period ?
RRB NTPC 23/07/2021 (Morning)
(a) Rs. 9,975 (b) Rs. 36,750
(c) Rs. 8,550 (d) Rs. 10,795

Q.294. Rs.21,150 is distributed among A, B, and C. The share of A is $\frac{4}{5}$ of the share of B, and the share of B is $\frac{3}{4}$ of the share of C. After receiving their respective sums, C gives some money out of her share to A so that after the transfer, the ratio of the sums A and C have is 7 : 9. What part of her initial share did C transfer to A ?
RRB NTPC 26/07/2021 (Morning)
(a) $\frac{1}{8}$ (b) $\frac{1}{10}$ (c) $\frac{1}{5}$ (d) $\frac{1}{12}$

Q.295. If a,b,c and d are in continued proportion, then $(ma^3 + nb^3 - rc^3) : (mb^3 + nc^3 - rd^3)$ = ?
RRB NTPC 26/07/2021 (Morning)
(a) d : a (b) a : d (c) b : c (d) c : b

Q.296. 15% of x = 25% of y = 50% of z. Find x : y : z.
RRB NTPC 26/07/2021 (Evening)
(a) 3 : 5 : 10 (b) 10 : 6 : 3
(c) 3 : 2 : 1 (d) 10 : 5 : 3

RRB JE
(22/05/2019 to 28/06/2019)

Q.297. In a bag, there are coins of 25 paise, 10 paise and 5 paise in the ratio of 1 : 2 : 3. If there are Rs.30 in all, how many 5 paise coins are there ?
RRB JE 22/05/2019 (Afternoon)
(a) 50 (b) 150 (c) 100 (d) 200

Q.298. From a cloth of 30 m long, 12 bits each measuring 225 cm are cut and sold. What fraction of the original length remains?
RRB JE 23/05/2019 (Evening)
(a) $\frac{1}{3}$ (b) $\frac{1}{9}$ (c) $\frac{3}{10}$ (d) $\frac{1}{10}$

Q.299. If a : (b + c) = 1 : 3 and c : (a + b) = 5 : 7, find the value of b : (c + a).
RRB JE 23/05/2019 (Evening)
(a) 4 : 5 (b) 3 : 5 (c) 1 : 2 (d) 3 : 4

Q.300. By how much is four-sevenths of 420 exceeding three - fifths of 200 ?
RRB JE 24/05/2019 (Evening)
(a) 80 (b) 120 (c) 90 (d) 60

Q.301. The sum of three numbers is 100. The ratio of the first number to the second number is 4 : 9 and the ratio of the second to the third number is 3 : 4. Find the second number.
RRB JE 25/05/2019 (Morning)
(a) 28 (b) 30 (c) 36 (d) 24

Q.302. Rs.305 is divided into three parts, such that 3/7 of the first, 2/3 of the second and 4/5 of the third are equal. Find the share of the third one.

RRB JE 26/05/2019 (Evening)
(a) Rs.62 (b) Rs.75 (c) Rs.72 (d) Rs.40

Q.303. If Rs.750 is divided into three parts x, y and z such that (x - 5) : (y - 10) : (z - 15) = 5 : 4 : 3, then find the share of x, y and z respectively.
RRB JE 30/05/2019 (Evening)
(a) Rs.250, Rs.200, Rs.150
(b) Rs.305, Rs.250, Rs.195
(c) Rs.310, Rs.170, Rs.240
(d) Rs.300, Rs.240, Rs.180

Q.304. Instead of dividing Rs.117 among P, Q and R in the ratio $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$, it was wrongly divided in the ratio 2 : 3 : 4. Who gains the most in this distribution and how much do they gain ?
RRB JE 31/05/2019 (Evening)
(a) P, Rs.28 (b) R, Rs.27
(c) R, Rs.25 (d) Q, Rs.35

Q.305. The population of a town increased by 10% and 20% in two successive years, but decreased by 25% in the third year. Find the ratio of the population in the third year and the population 3 years back.
RRB JE 01/06/2019 (Morning)
(a) 1 : 1 (b) 2 : 1 (c) 99 : 100 (d) 100 : 99

Q.306. The ratio of salaries of P and Q last year is 4 : 5. The ratio of last year salary and the present salary of P is 3 : 5 and for Q this ratio is 2 : 3. If their total salary at present is Rs. 6800, what is salary of Q ?
RRB JE 01/06/2019 (Evening)
(a) Rs.2700 (b) Rs.3600
(c) Rs.4200 (d) Rs.3200

Q.307. $\frac{2}{5}$ of a set of notebooks that are sold on the first day. $\frac{3}{4}$ of the remaining got sold on the second day. If 75 notebooks remain still, how many notebooks were kept for sale?
RRB JE 28/06/2019 (Evening)
(a) 750 (b) 500 (c) 1000 (d) 250

RRB ALP Tier - 2 (21/01/2019 to 08/02/2019)

Q.308. The ratio of the present salaries of Vinod and Manoj is 6 : 7. If the salary of both is increased by ₹ 16,000, then the ratio becomes 8 : 9. What is the present salary of Manoj ?
ALP Tier II 21/01/2019 (Afternoon)
(a) ₹64,000 (b) ₹56,000
(c) ₹72,000 (d) ₹48,000

Q.309. The ratio of the shorter side of an A4 sheet to the longer side of an A3 sheet is _____.
ALP Tier II 21/01/2019 (Afternoon)
(a) 1 : 4 (b) 2 : 1 (c) 1 : 2 (d) 1 : 1

Q.310. An employee's monthly salary is ₹ 12,600, and he spends $\frac{5}{7}$ of it. If his salary is increased by $\frac{1}{3}$ and the expenditure is increased by $\frac{1}{5}$ th of the current expenditure, what fraction of his salary will he be able to save now?
ALP Tier II 23/01/2019 (Morning)
(a) $\frac{7}{16}$ (b) $\frac{7}{15}$ (c) $\frac{5}{14}$ (d) $\frac{8}{15}$

RPF Constable (17/01/2019 to 19/02/2019)

Q.311. A specific amount is divided into 2 parts in the ratio 6: 5. If the first part is 48 rupees, then the total amount (in rupees) is :-
RPF Constable 17/01/2019 (Morning)
(a) 77 (b) 88 (c) 99 (d) 66

Q.312. In a box, pen, pencil, and eraser are kept in the ratio 3: 2: 1. If the costs of pen, pencil and eraser are Rs 3, 2 rupees and 2 rupees, and the cost for the whole box is 285 rupees. , then how many pens are there in the box ?
RPF Constable 17/01/2019 (Evening)
(a) 59 (b) 60 (c) 57 (d) 58

Q.313. A, B and C divide a cash prize among themselves in the ratio 6:7:8. If C got Rs.52,000, find the total amount received by A and B together.
RPF Constable 18/01/2019 (Morning)
(a) Rs.88,500 (b) Rs.86,500
(c) Rs.84,500 (d) Rs.92,500

Q.314. A school kid bought three different types of pens and their numbers are in the ratio 7 : 6 : 5, which costs Rs.5, Rs.10, Rs.15 respectively. If the kid has spent Rs.340 to buy all the pens. Find the number of 10 rupee pen that he has bought.
RPF Constable 18/01/2019 (Morning)
(a) 10 (b) 14 (c) 16 (d) 12

Q.315. The pen, pencil, and eraser in a box are in the ratio 3 : 2 : 1. If the prices of pen, pencil and eraser are 3, 2 and 2 respectively and the cost is 180 rupees, then count the number of pen in the box.
RPF Constable 18/01/2019 (Afternoon)
(a) 33 (b) 41 (c) 36 (d) 39

Q.316. A box contains pens, pencils and erasers in the ratio 3:2:1. If the cost of pen, pencil and eraser is Rs. 3, Rs. 2 and Rs. 2 and if the amount spent on the box is Rs 135, then find the number of pens in the box.
RPF Constable 18/01/2019 (Evening)
(a) 25 (b) 27 (c) 28 (d) 26

Q.317. The children of a school buy three different types of pen and their ratio is 5 : 6 : 4, whose value is Rs. 5, Rs. 10, Rs. 15 is. If the child spent Rs 290 to buy all the pens, then find the number of Rs 10 pens bought by him.
RPF Constable 19/01/2019 (Morning)
(a) 12 (b) 14 (c) 18 (d) 16

Q.318. A, B and C divide a cash prize among them in the ratio of 3: 5: 7. If C receives Rs. 49000, then find the total amount received by combining both A and B.
RPF Constable 19/01/2019 (Morning)
(a) Rupee. 65,000 (b) Rupee. 44,000
(c) Rupee. 80,000 (d) Rupee. 56,000

RPF S.I. (19/12/2018 to 16/01/2019)

Q.319. A bag contains old coins of different types in the ratio 12 : 13 : 11, whose values are ₹ 3, ₹ 4 and ₹ 5 respectively. If the total value of coins is ₹572, then what is the total number of coins of value ₹3 ?
RPF S.I. 19/12/2018 (Morning)
(a) 48 (b) 38 (c) 56 (d) 26

Q.320. The salaries of Sam, Sai and Shree are in the ratio 7:9:11. If Shree gets ₹ 320 more than Sam, then what is Sai's salary (in ₹) ?
RPF S.I. 19/12/2018 (Morning)
(a) 840 (b) 740 (c) 820 (d) 720

Q.321. Ganguly distributes 450 gifts among 4 children. The number of gifts received by the first child is, double the number of gifts received by the second child, thrice the number of gifts received by the third child and four times the number of gifts received by the fourth child . How many gifts did the fourth child receive ?
RPF S.I. 19/12/2018 (Evening)
(a) 216 (b) 34 (c) 54 (d) 108

Q.322. A bag contains old coins of different types in the ratio 12 : 11 : 13, whose values are ₹ 3, ₹ 4 and ₹ 5 respectively. If the total value of coins is ₹580, then what will be the total number of coins of value ₹3 ?
RPF S.I. 19/12/2018 (Evening)
(a) 44 (b) 50 (c) 46 (d) 48

Q.323. Vinod distributes 400 gifts among 4 children. The number of gifts received by the first child is twice the number of gifts received by the second child, thrice the number of gifts received by the third child and four times the number of gifts received by the fourth child. How many toys did the first and second child together get ?
RPF S.I. 24/12/2018 (Morning)
(a) 226 (b) 288 (c) 192 (d) 120

Q.324. A bag contains 3 different types of old coins in the ratio 7 : 5 : 3, whose values are ₹ 3, ₹ 4 and ₹ 5 respectively. If the total value of coins is ₹392, then what is the total number of coins of value ₹3 ?
RPF S.I. 24/12/2018 (Morning)
(a) 46 (b) 45 (c) 42 (d) 49

Q.325. The salaries of Wasim, Wilson and William are in the ratio 7 : 11 : 9. If William gets ₹ 120 more than Wasim, then what is Wilson's salary (in ₹)?
RPF S.I. 24/12/2018 (Morning)
(a) 880 (b) 440 (c) 660 (d) 770

Q.326. In one box, three different types of old coins are in the ratio of 3 : 5 : 7, the value of old coins is Rs. 1, 5 and 10 rupees respectively. If the total price of coins kept in the box is 686, then tell the number of old coins of 10 rupees.
RPF S.I. 05/01/2019 (Morning)
(a) 48 (b) 51 (c) 50 (d) 49

Q.327. In a box, there are three different types of old coins in ratio 6: 7: 8; the value of the old coin is Rs. 1, Rs. 5 and Rs. 10 respectively. If the total value of the coin is 847 rupees in the box, then find the number of coins worth 10 rupees.
RPF S.I. 06/01/2019 (Morning)
(a) 84 (b) 65 (c) 56 (d) 48

Q.328. Akil distributes 550 gifts among 4 children. The number of gifts received by the first child is, double the number of gifts received by the second child, thrice the number of gifts received by the third child and four times the number of gifts received by the fourth child . Find the total number of gifts received by the first child and the second child.
RPF S.I. 06/01/2019 (Morning)
(a) 324 (b) 396 (c) 384 (d) 372

Q.329. A rich person distributed 725 gifts among 4 children. The first child received gifts twice the share of the second child, three times the share of the third child and four times the share of the fourth child. calculate the number of total gifts received by the first and the second child.
RPF S.I. 06/01/2019 (Afternoon)
(a) 518 (b) 516 (c) 522 (d) 520

Q.330. A bag contains old coins of 3 different types in the ratio 3 : 5 : 7, whose values are ₹ 1, ₹ 5 and ₹ 10 respectively. If the total value of coins is ₹ 1372, then what is the total number of coins of value ₹ 10 ?
RPF S.I. 06/01/2019 (Afternoon)
(a) 92 (b) 96 (c) 94 (d) 98

Q.331. The salaries of Hameed, Salman and Ganesh are in the ratio 7 : 11 : 9. If Ganesh gets ₹ 852 more than Hameed, then what is Salman's salary (in Rupees)?
RPF S.I. 06/01/2019 (Afternoon)
(a) 1,065 (b) 1,035 (c) 1,055 (d) 1,045

Q.332. Amir distributed 775 gifts among 4 children. The share of the first child is twice that of the second child, thrice that of the third child and four times that of the fourth child. Find the total number of gifts received by the first and second child.
RPF S.I. 10/01/2019 (Morning)
(a) 558 (b) 554 (c) 556 (d) 552

Q.333. In one box, three different types of old coins are in the ratio of 3: 5: 7, the value of old coins is 1 rupees, 5 rupees, and 10 rupees respectively. If the total value of old coins in the box is Rs 294, then tell the number of old coins of Rs 10.
RPF S.I. 10/01/2019 (Morning)
(a) 22 (b) 24 (c) 21 (d) 23

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.334. There are saplings of 361 Mango tree and Neem tree in a garden. The ratio of the number of Mango tree to that of Neem tree saplings is 8 : 11, then how many Neem tree saplings are in the garden ?
RRB ALP 09/08/2018 (Afternoon)
(a) 57 (b) 209 (c) 152 (d) 171

Q.335. The ratio of sand to gravel in a mixture is 17 : 8 while that between gravel and cement is 6 : 17. What is the ratio of sand to cement in the mixture?
RRB ALP 09/08/2018 (Evening)
(a) 3 : 4 (b) 17 : 17 (c) 289 : 48 (d) 8 : 6

Q.336. In an alloy of German silver the ratio of copper to zinc was 17 : 7 while that of nickel to zinc was 4 : 3. The ratio of copper to zinc to nickel in the alloy was:
RRB ALP 10/08/2018 (Afternoon)
(a) 51: 21: 28 (b) 17 : 21 : 4
(c) 68 : 28 : 21 (d) 17: 28 : 3

Q.337. The ratio of the heights of Nani and Leelu is 4 : 3. If Leelu is 1.2 m tall, then what is the height of Nani ?
RRB ALP 10/08/2018 (Evening)
(a) 0.9 m (b) 2m (c) 1.6 m (d) 1.8 m

Q.338. Vishnu spends ₹ 5000 in buying 12 tables and some chairs. The cost of one table is ₹ 50 and that of one chair is 40. What is the ratio of the numbers of the chairs to the number of tables purchased ?
RRB ALP 13/08/2018 (Morning)
(a) 55 : 4 (b) 5 : 1 (c) 5 : 2 (d) 55 : 6

Q.339. In a bag containing red, green and pink tokens, the ratio of red to green tokens was 5 : 12 while the ratio of pink to red tokens was 7 : 15. What was the ratio of green to pink tokens ?
RRB ALP 13/08/2018 (Morning)
(a) 36 : 7 (b) 25 : 28 (c) 12 : 7 (d) 28 : 25

Q.340. The initial ratio of sugar to flour in a dough was 2 : 7. To 9 kg of the dough John added more sugar to make the sugar to flour ratio 2 : 5. How much sugar did John later add ?
RRB ALP 13/08/2018 (Afternoon)
(a) 1.2 kg (b) 750g (c) 800 g (d)1 kg

Q.341. The ratio of the areas of a square and a regular hexagon, both inscribed in a circle is?
RRB ALP 13/08/2018 (Afternoon)
(a) 2 : 3 (b) $3\sqrt{3}$: 2 (c) 4 : $3\sqrt{3}$ (d) 1 : $\sqrt{3}$

Q.342. There are red (A), yellow (B) and green (C) tokens in a bag. A : B :: 3 : 8 , B : C :: 6 : 13. A : B : C is given by :
RRB ALP 13/08/2018 (Evening)
(a) 3 : 8 : 13 (b) 3 : 6 : 13
(c) 3 : 48 : 13 (d) 9 : 24 : 52

Q.343. In a bag the ratio of red balls to green balls is 4 : 9. If 6 more green balls were added to the bag, the ratio of red balls to green balls would become 1 : 3. How many red balls are there in the bag ?
RRB ALP 14/08/2018 (Morning)
(a) 9 (b) 8 (c) 12 (d) 10

Q.344. A bag contains coins of denomination ₹ 1 ₹5 and ₹ 10. Assuming there are equal number of ₹ 1, ₹ 5 and ₹ 10 coins, what will the total number of coins in the bag be if the total money is ₹ 368 ?

RRB ALP 14/08/2018 (Evening)
(a) 96 (b) 65 (c) 56 (d) 69

Q.345. Some one rupee, 50 paisa and 25 paisa coins make up rupees 93.75 and their numbers are in the proportion of 3 : 4 : 5.Find the number of each type of coins ?
RRB ALP 17/08/2018 (Afternoon)
(a) 45, 60, 75 (b) 46, 58, 75
(c) 40, 70, 75 (d) 42, 56, 70

Q.346. The ratio of the number of marbles that Joyee and Minati had was 5 : 8 while the ratio of the number of marbles that Jacob and Minati had was 7 : 12. What is the ratio of the number of marbles that Joyee and Jacob had ?
RRB ALP 20/08/2018 (Afternoon)
(a) 7 : 5 (b) 5 : 7 (c) 15 : 14 (d) 2 : 3

Q.347. The ratio of the number of marbles that Pulak and Menaja had was 5 : 9 while the ratio of the number of marbles that Jairam and Menaja had was 7 : 18. What is the ratio of the number of marbles that Pulak and Jairam had ?
RRB ALP 21/08/2018 (Evening)
(a) 10 : 7 (b) 5 : 7 (c) 2 : 3 (d) 7 : 5

Q.348. A television show lasted for $4\frac{2}{3}$ hours. If $\frac{1}{5}$th of the total time was spent on advertisements, what was the actual duration of the television show?
RRB ALP 29/08/2018 (Evening)
(a) $\frac{4}{5}$ hours (b) $2\frac{7}{15}$ hours
(c) $\frac{14}{15}$ hours (d) $3\frac{11}{15}$ hours

Q.349. In a class consisting of boys and girls, there are 45 students. If three fifth of the students are boys, find the number of boys in the class.
RRB ALP 30/08/2018 (Morning)
(a) 25 (b) 27 (c) 18 (d) 26

Q.350. Two partners M and N buy a car. M pays his share of $\frac{3}{7}$th of the total cost of the car. M pays ₹ 31,540 less than N. What is the cost of the car ?
RRB ALP 31/08/2018 (Evening)
(a) ₹ 2,20,780 (b) ₹ 2,32,680
(c) ₹ 2,03,175 (d) ₹ 1,85,780

Answer key:-

1.(a)	2.(a)	3.(b)	4.(c)
5.(c)	6.(d)	7.(d)	8.(d)
9.(b)	10.(a)	11.(b)	12.(a)
13.(c)	14.(c)	15.(d)	16.(b)

17.(a)	18.(b)	19.(a)	20.(c)
21.(a)	22.(b)	23.(b)	24.(b)
25.(d)	26.(b)	27.(d)	28.(c)
29.(d)	30.(d)	31.(d)	32.(b)
33.(d)	34.(c)	35.(b)	36.(a)
37.(b)	38.(b)	39.(b)	40.(c)
41.(d)	42.(d)	43.(a)	44.(b)
45.(b)	46.(a)	47.(c)	48.(c)
49.(c)	50.(a)	51.(a)	52.(b)
53.(d)	54.(a)	55.(b)	56.(d)
57.(c)	58.(d)	59.(d)	60.(b)
61.(a)	62.(c)	63.(c)	64.(c)
65.(a)	66.(b)	67.(c)	68.(b)
69.(c)	70.(c)	71.(a)	72.(d)
73.(a)	74.(a)	75.(d)	76.(c)
77.(d)	78.(a)	79.(a)	80.(c)
81.(b)	82.(b)	83.(d)	84.(a)
85.(b)	86.(a)	87.(b)	88.(c)
89.(d)	90.(d)	91.(a)	92.(a)
93.(b)	94.(b)	95.(b)	96.(a)
97.(b)	98.(d)	99.(a)	100.(a)
101.(d)	102.(d)	103.(a)	104.(b)
105.(b)	106.(c)	107.(b)	108.(c)
109.(a)	110.(c)	111.(d)	112.(c)
113.(d)	114.(b)	115.(a)	116.(d)
117.(c)	118.(b)	119.(a)	120.(d)
121.(d)	122.(c)	123.(b)	124.(b)
125.(d)	126.(d)	127.(a)	128.(d)
129.(d)	130.(d)	131.(a)	132.(b)
133.(b)	134.(a)	135.(d)	136.(d)
137.(b)	138.(d)	139.(b)	140.(b)
141.(d)	142.(a)	143.(c)	144.(d)
145.(b)	146.(b)	147.(b)	148.(b)
149.(a)	150.(d)	151.(c)	152.(a)
153.(a)	154.(c)	155.(d)	156.(c)
157.(d)	158.(b)	159.(a)	160.(a)
161.(c)	162.(b)	163.(a)	164.(d)
165.(d)	166.(a)	167.(b)	168.(b)
169.(d)	170.(c)	171.(c)	172.(d)
173.(c)	174.(d)	175.(c)	176.(d)
177.(d)	178.(b)	179.(a)	180.(a)
181.(b)	182.(a)	183.(a)	184.(a)
185.(d)	186.(b)	187.(a)	188.(b)
189.(c)	190.(b)	191.(b)	192.(d)
193.(d)	194.(a)	195.(c)	196.(a)
197.(a)	198.(a)	199.(a)	200.(b)

201.(d)	202.(d)	203.(a)	204.(a)
205.(c)	206.(a)	207.(c)	208.(b)
209.(a)	210.(b)	211.(a)	212.(b)
213.(b)	214.(b)	215.(d)	216.(b)
217.(a)	218.(c)	219.(b)	220.(d)
221.(a)	222.(b)	223.(a)	224.(b)
225.(b)	226.(a)	227.(c)	228.(a)
229.(c)	230.(c)	231.(a)	232.(c)
233.(a)	234.(d)	235.(a)	236.(a)
237.(d)	238.(c)	239.(b)	240.(c)
241.(d)	242.(c)	243.(b)	244.(c)
245.(d)	246.(b)	247.(d)	248.(a)
249.(b)	250.(d)	251.(c)	252.(c)
253.(b)	254.(c)	255.(b)	256.(d)
257.(a)	258.(b)	259.(a)	260.(d)
261.(c)	262.(b)	263.(c)	264.(c)
265.(d)	266.(a)	267.(c)	268.(b)
269.(c)	270.(a)	271.(b)	272.(a)
273.(a)	274.(c)	275.(a)	276.(c)
277.(d)	278.(a)	279.(c)	280.(b)
281.(d)	282.(d)	283.(c)	284.(c)
285.(d)	286.(d)	287.(c)	288.(c)
289.(d)	290.(a)	291.(a)	292.(c)
293.(a)	294.(b)	295.(b)	296.(b)
297.(b)	298.(d)	299.(c)	300.(b)
301.(c)	302.(b)	303.(b)	304.(c)
305.(c)	306.(b)	307.(b)	308.(b)
309.(c)	310.(c)	311.(b)	312.(c)
313.(c)	314.(d)	315.(c)	316.(b)
317.(a)	318.(d)	319.(a)	320.(d)
321.(c)	322.(d)	323.(b)	324.(d)
325.(c)	326.(d)	327.(c)	328.(b)
329.(c)	330.(d)	331.(a)	332.(a)
333.(c)	334.(b)	335.(a)	336.(a)
337.(c)	338.(d)	339.(a)	340.(c)
341.(c)	342.(d)	343.(b)	344.(d)
345.(a)	346.(c)	347.(a)	348.(d)
349.(b)	350.(a)		

Solutions:-

Sol.1.(a) $x = 2$
$(5 + x) : (2x + 7) :: (6x + 9) : y$
$= (5 + 2) : (4 + 7) :: (12 + 9) : y$
$= 7 : 11 :: 21 : y \Rightarrow y = \frac{11 \times 21}{7} = 33$

Sol.2.(a) $9 : 12 :: 12 : x$
$\Rightarrow x = \frac{12 \times 12}{9} = 16$

$28 : 42 :: 42 : y$

$\Rightarrow y = \frac{42 \times 42}{28} = 63$

$2x + y = 32 + 63 = 95$

Sol.3.(b)

Let the numbers are 5x , 6x and 8x

$(5x)^2 + (6x)^2 + (8x)^2 = 1250$

$125x^2 = 1250 \Rightarrow x = \sqrt{10}$

Now, Product of the numbers = $5\sqrt{10} \times 6\sqrt{10} \times 8\sqrt{10} = 2400\sqrt{10}$

Sol.4.(c) Let the monthly income of Anuj and Madhew be 5x and 7x

$\frac{5x - 10000}{7x - 10000} = \frac{2}{3}$

$\Rightarrow 15x - 30000 = 14x - 20000$

$\Rightarrow 15x - 14x = 10000 \Rightarrow x = 10000$

monthly income of Anuj = 5 × 10000

= ₹50,000

Sol.5.(c) Let the shares of A, B, C, D are 4x , 7x , 9x , 3x $\Rightarrow$ 9x - 3x = 720

$\Rightarrow 6x = 720 \Rightarrow x = 120$

D's share = $3 \times 120 = ₹360$

Sol.6.(d) 48 : x :: x : 75

$\Rightarrow x^2 = 48 \times 75 \Rightarrow x = \sqrt{48 \times 75} = 60$

Sol.7.(d)

If x = 3, then x + 7x : x + 5 :: x + 6 : d

24 : 8 :: 9 : d $\Rightarrow d = \frac{9 \times 8}{24} \Rightarrow d = 3$

Sol.8.(d) Let the digits on the hundred place be 3x, tenth place be 2x and ones place be x Number formed = 300x + 20x + x Now after reversing the digits , number = 100x + 20x + 3x

Now, $321x + 123x = 1332$

$\Rightarrow 444x = 1332 \Rightarrow x = 3$

Hence, Required number = 963

Sol.9.(b) 12 : x :: x : 27 and 25 : y :: y : 36

$\Rightarrow x^2$ = 324 and y^2 = 900

$\Rightarrow x = 18 \; and \; y = 30$

Now, x : y = 18 : 30 = 3 : 5

Sol.10.(a)

Let the capacity of the vessel be x cups.

$\frac{3x}{4} - \frac{x}{4} = 10 \Rightarrow \frac{2x}{4} = 10 \Rightarrow x = 20$

Capacity of the vessel = 20 cups.

Sol.11.(b) Let the numbers are 5x and 8x

+ 40% means 5 → 7

- 15% means 20 → 17

New ratio = $5x \times \frac{7}{5} : 8x \times \frac{17}{20}$

$= 7x : \frac{34x}{5} = 35 : 34$

Sol.12.(a) Third proportional = $\frac{b^2}{a}$

$\Rightarrow \frac{(a+b)^4}{(a+b)} = (a + b)^3$

Sol.13.(c)

$\frac{1}{4} \times 8 : \frac{1}{2} \times 8 : \frac{1}{2} \times 8 = 2 : 4 : 4$

25 - paise coin $(4 \; unit) \rightarrow 100$

$\Rightarrow 1 \; unit \rightarrow 25$

Now, total amount

= (1 × 2 × 25) + (0.5 × 4 × 25) + (0.25 × 4 × 25) = 50 + 50 + 25 = ₹125

Sol.14.(c) Ratio of income of Seema and Darshan = 7 : 5

Ratio of expenditure of Seema and Darshan = 17 : 12

As per the question,

7x - 17 y = 12000 ...(1) × 5

5x - 12y = 9000 ...(2) × 7

Now subtracting equation (1) from (2)

35x - 84y = 63000

35x - 85y =60000

Y = 3000

Therefore, total expenditure

= (17 + 12) × 3000 = ₹87000

Sol.15.(d) Third proportional of 20 and 50 = $\frac{50 \times 50}{20}$ = 125

And mean proportional of 9 and 16

= $\sqrt{9 \times 16}$ = 12

As per the question,

Required ratio = 125 : 12

Sol.16.(b)

$(11 + x) : (14 + x) :: (31 + x) : (38 + x)$

$\Rightarrow (11 + x) \times (38 + x)$

$\Rightarrow (31 + x) : (14 + x)$

$\Rightarrow 418 + 11x + 38x + x^2$

$= 434 + 31x + 14x + x^2$

$\Rightarrow 49x + 418 = 45x + 434$

$\Rightarrow 49x - 45x = 434 - 418$

$\Rightarrow 4x = 16 \Rightarrow x = 4$

Now, $3x : y :: y : (8x - 5)$

$\Rightarrow 3x(8x - 5) = y^2 \Rightarrow 12(8 \times 4 - 5) = y^2$

$\Rightarrow y^2 = 324 \Rightarrow y = \sqrt{324} = 18$

Sol.17.(a) Third proportion = $\frac{b^2}{a}$

$= \frac{(x-y)^2}{x^3 - y^3} = \frac{(x-y)(x-y)}{(x-y)(x^2 + xy + y^2)}$

$= \frac{x-y}{x^2 + xy + y^2}$

Sol.18.(b) A : (B + C) = 3 : 5

A + B + C = ₹4800

$3x + 5x = 4800 \Rightarrow 8x = 4800 \Rightarrow x = 600$

A's share = ₹ 1800

Now, C : (A + B) = 5 : 7

$5x + 7x = 4800 \Rightarrow 12x = 4800 \Rightarrow x = 400$

C's share = ₹2000

and B's share = 4800 - (2000+1800)

= 1000

Now, difference between A's share and B's share = 1800 - 1000 = ₹800

Sol.19.(a) Let the number be a and b

Mean proportional ($\sqrt{ab}$) = 14

So ab = 196 $\Rightarrow$ a = $\frac{196}{b}$

And , $\frac{b^2}{a}$ = 4802 .....(1)

By putting the value of a in equation (1)

$\frac{b^2}{\frac{196}{b}}$ = 4802 $\Rightarrow$ b^3 = 4802 × 196

So b = 98 and a = $\frac{196}{98}$ = 2

Therefore number be 2 and 98

Alternate method:-

By observing options,

Form option (a)

Mean proportional = $\sqrt{2 \times 98}$ =14

Third proportional = $\frac{98 \times 98}{2}$ = 4802

Sol.20.(c) a : b :: b : c $\Rightarrow b^2 = ac$

Mean proportion (b^2)= $(8 + 4\sqrt{2})$

$\times (6-3\sqrt{2}) \Rightarrow b^2 = 48 - 24\sqrt{2} + 24\sqrt{2} - 24$

$\Rightarrow b = \sqrt{24} = 2\sqrt{6}$

Sol.21.(a) Let the numbers be x and y.

$x + y = 20 \ldots\ldots\ldots (1)$

$x - y = 16 \ldots\ldots\ldots (2)$

By solving eq . (1) and (2) we get x = 18 and y = 2

Hence, the ratio of larger number to the smaller number is = 9 : 1

Sol.22.(b) Scale = 1 : 400000

The actual distance between the two points = 5 × 400000 = 2000000 cm or $\frac{2000000}{100000} = 20 \; km$

Sol.23.(b) b = 1 + 3 + 5 = 9

Third proportional = $\frac{a}{b} = \frac{b}{c}$

c = $\frac{9 \times 9}{15} = \frac{27}{5}$

Sol.24.(b) As per question,

$\frac{1}{2} \times A = \frac{1}{3} \times B = \frac{1}{5} \times C = k$

A = 2k ,B = 3k ,C = 5k

2K + 3K + 5K = 2000

$\Rightarrow$ 10K = 2000 $\Rightarrow$ K = 200

So, A's part = 2K = 2 × 200 = 400

Sol.25.(d) Total number of pages of the book = 264 pages.

Number of pages that teacher taught

$= \frac{2}{3} \times 264 = 176 \; pages.$

Remaining pages = 264 - 176 = 88 pages.

Number of pages that student studied at home = $\frac{1}{8} \times 88 = 11 \; pages.$

Hence, the number of pages that are left to be taught = 88 - 11 = 77 pages.

Sol.26.(b) a : b :: b : c

$\frac{a}{b} = \frac{b}{c} \Rightarrow b^2 = ac \Rightarrow$ ac = 36

(as b = 6).....(1)

Now, c = 4a $\Rightarrow \frac{a}{c} = \frac{1}{4}$,

let a = x and c = 4x,

From eq . 1, $4x^2 = 36 \Rightarrow x = \sqrt{9} = 3$

a = 3 and c = 12

Sol.27.(d) Let the shares of A, B and C be

2A : 3B : 5C = k

A : B : C = $\frac{k}{2} : \frac{k}{3} : \frac{k}{5} = 15 : 10 : 6$

Now, C's share = $\frac{6}{31} \times 651 = ₹126$

Sol.28.(c) $x^3y : xy :: xy : a$

$\Rightarrow a = \frac{xy \times xy}{x^3y} \Rightarrow \frac{y}{x}$

Sol.29.(d) 256 : b :: b : 324

$\Rightarrow b = \sqrt{256 \times 324} = 16 \times 18 = 288$

Sol.30.(d) 60% of A = 1.2 of B = $\frac{2}{5}$ of C

$let, \frac{3}{5}A = \frac{12}{10}B = \frac{2}{5}C = k$

A = $\frac{5k}{3}$, $B = \frac{5k}{6}$ $and\ C = \frac{5k}{2}$

Then, A : B : C = 10 : 5 : 15 or 2 : 1 : 3

Sol.31.(d) $7x + 5 : 7x + 4 :: 5x + 5 : y$

$\Rightarrow$ 40 : 39 :: 30 : y $\Rightarrow$ y = $\frac{39 \times 30}{40}$

= 29.25

Sol.32.(b)

Let Jatin gave x rupee to both of them.

$\frac{4+x}{7+x} = \frac{7}{9} \Rightarrow 9(4 + x) = 7(7 + x)$

$\Rightarrow 36 + 9x = 49 + 7x$

$\Rightarrow 9x - 7x = 49 - 36$

$\Rightarrow 2x = 13 \Rightarrow x = 6.50$

So, he gave 6.50 rupee to both.

Sol.33.(d) Let the two part be 2x and 3x.

$2x + 3x = 145 \Rightarrow 5x = 145 \Rightarrow x = 29$

a = 58 and b = 87

$a : c :: c : b \Rightarrow 58 : c :: c : 87$

$\Rightarrow c^2 = 58 \times 87$

$\Rightarrow c = \sqrt{58 \times 87} = 29\sqrt{6} = 71$

Sol.34.(c)

Income of A to B = 3 : 5 or 36 : 60

Expenditure of A = 36 × $\frac{7}{12}$ = 21 unit

Expenditure of B = 60 × $\frac{8}{15}$ = 32 unit

Difference between their expenditure = 32 - 21 = 11 unit

According to question,

11 unit = 14,300 $\Rightarrow$ 36 unit = 46,800

So, Income of A = 46,800

Sol.35.(b) Ratio = 3 : 5 : 7

According to the question ,

(10 × 3k) + (20 × 5k) + (50 × 7k) = 3360

30k + 100k + 350k = 3360

480k = 3360 $\Rightarrow$ k = 7

Numbers of 20 rs. Notes = 5 ×7=35

Sol.36.(a) Ravish reads $\frac{4}{5}$th of the book so remaining book $\frac{1}{5}th$ = 120 pages

Ravish reads

$\Rightarrow \frac{4}{5}$th of the book = $\frac{120 \times 5 \times 4}{5}$

= 480 pages

Soma reads $\frac{5}{8}$ of the book so remaining book $\frac{3}{8}th$ = 120 pages Soma reads

$\Rightarrow \frac{5}{8}$th of the book = $\frac{120 \times 8 \times 5}{3 \times 8}$

= 200 pages

Now, required fraction = $\frac{200\ pages}{480\ pages} = \frac{5}{12}$

Sol.37.(b) As per question,

11x + 50 + 18x + 100 + 24x + 75 = 5525

$\Rightarrow$ 53x = 5525 - 50 - 100 - 75 $\Rightarrow$ x = 100

Share of C = 24x + 75 = 24(100) + 75 =2475

Sol.38.(b) A : B = 1.2 : 2 or 3 : 5 ..... ×3

B : C = 1.5 : 2 or 3 : 4 ..... × 5

C : D = 2 : 3..... × 10

On balancing the ratio,

A : B : C : D = 9 : 15 : 20 : 30

So, B : D = 15 : 30 or 1 : 2

Sol.39.(b)

Number of girls = 288 × $\frac{5}{8}$ = 180

Number of girls below 12 years = 180 × $\frac{2}{5}$

= 72

Number of boys = 288 - 180 = 108

Number of boys below 12 years = 108 × $\frac{5}{9}$

= 60

Total number of students below 12 years of age = 72 + 60 = 132

Sol.40.(c)

Initial ratio of Ladies and Gents = 3 : 2 ,

After joining of 300 Ladies,

Ratio of Ladies and Gents = 5 : 2 ,

So, the difference (5 - 3) = 2 units is equivalent to 300,

$\Rightarrow$ 5 units will be equivalent to = $300 \times \frac{5}{2}$

$= 750$

i.e. the number of lady members now in the club is 750.

Sol.41(d) Let the fraction is $\frac{x}{y}$

The numerator of a fraction is 2 less than the denominator $\Rightarrow (y - x) = 2$

If the numerator is multiplied by 2 and the denominator is multiplied by 3. then the fraction becomes $\frac{2}{9}$.

$\Rightarrow \frac{2x}{3y} = \frac{2}{9} \Rightarrow \frac{x}{y} = \frac{1}{3}$

Clearly , condition(y - x) = 2 satisfy

Sol.42.(d) Let the total money invested = p

The man invested $\frac{P}{2}$ of his capital at 5% rate of interest per annum, $\frac{P}{3}$ of his capital at 8% per annum and the remaining i.e. $\frac{P}{6}$ at 10% rate of interest per annum.

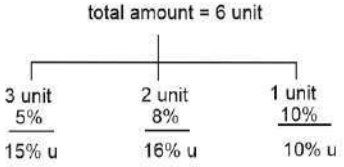
According to the question,

$\Rightarrow \frac{P}{100}(\frac{5}{2} + \frac{8}{3} + \frac{5}{3}) = 820$

$\Rightarrow P = \frac{820 \times 6 \times 100}{41} \Rightarrow P = 12000$

So, the total capital invested is 12,000 Rs.

Short Tricks :-



According to the question :- 41 % unit = 820 Rs.

1 unit = $\frac{820}{41} \times 100$ = 2000 Rs.

Then , 6 units = 12000 Rs.

Sol.43.(a) Three person's ratio of share

= $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$ = 6 : 4 : 3

At the end of the year, the total profit was Rs. 15600.

So, the largest share received in profit will be = 15600 × $\frac{6}{13}$ = 7200

Sol.44.(b) The product of three numbers is 10290 and the numbers are in the ratio of 3 : 5 : 2.

$\Rightarrow 30x^3 = 10290 \Rightarrow x^3 = 343 \Rightarrow x = 7$

So, the greatest number amongst the three numbers is = 5 × 7 = 35

Sol.45.(b) We know , $\frac{4}{5}$N = 12 + $\frac{3}{4}$N

$\Rightarrow (\frac{4}{5} - \frac{3}{4})$N = 20 $\Rightarrow \frac{1}{20}$N = 12

= N = 240

So, the number is 240

Sol.46.(a) Sum of two numbers = 25

difference of two numbers = 15

Let both numbers are x and y,

$\therefore$ x + y = 25 ---(1) and

x - y = 15 ---(2)

By solving equation (1) and (2),

we get, x = 20 and y = 5

∴ x : y = 20 : 5 = 4 : 1.

Sol.47.(c) The aeroplane is carrying 500 passengers, of which 45% are men and 20% are children.

So, the number of males = $\frac{45}{100} \times 500$
$= 225$
The number of children = $\frac{20}{100} \times 500$
$= 100$
The number of women = $(500 - 325)$
$= 175$
Then, the ratio of men : women : children = 225 : 175 : 100 = 9 : 7 : 4

Sol.48.(c) $\frac{x}{y} = \frac{10}{15} = \frac{2}{3}$
But in the case of the third option (15 , 20) the ratio is not equal to $\frac{2}{3}$.

Sol.49.(c) Let the smaller number = x , and bigger number = y
ATQ,
y - x = 5 ----- (1)
$\Rightarrow \frac{x-25}{y+20} = \frac{1}{2}$
⇒ 2x - 50 = y + 20 ⇒ 2x - y = 70 ----- (2)
By solving equation (1) and (2), we get
x = 75 and y = 80

Sol.50.(a)
Total votes polled = $\frac{984321}{9} \times 11$
= 1203059

Sol.51.(a) (a + b) : (b + c) : (c + a)
= 6 : 7 : 8 ⇒ 2(a + b + c) = 21
⇒ a + b + c = 10.5 ⇒ 14
∴ c = 10.5 - 6 = 4.5 ⇒ $\frac{14}{10.5} \times 4.5 = 6$

Sol.52.(b) Total rent = 15000
Fraction of rent to be paid equally by Sumit and Krishan over total rent
= $\frac{10000}{15000} = \frac{2}{3}$
⇒ Sumit : Krishan = $\frac{1}{3} : \frac{1}{3}$
Fraction of rent to be paid by Ajay and Sunil over total rent = $\frac{5000}{15000} = \frac{1}{3}$
Ratio of days spent by Ajay and Sunil
= 15 days : 30 days = 1 : 2
Further, Ajay and sunil will share their rent on the basis of days spent by them per month,
ratio will be = $\frac{1}{3} \times \frac{1}{3} : \frac{1}{3} \times \frac{2}{3} = \frac{1}{9} : \frac{2}{9}$
The share of rent paid by Ajay, Sunil, Sumit and Krishan = $\frac{1}{9} : \frac{2}{9} : \frac{1}{3} : \frac{1}{3}$

Sol.53.(d) 11th term of an AP = a + 10d
18th term of AP = a + 17d
A/Q , $\frac{a+10d}{a+17d} = \frac{2}{3}$
⇒ 3a + 30d = 2a + 34d
⇒ a = 4d ⇒ $\frac{a}{d} = \frac{4}{1}$
Sum of 1st five term
= $\frac{5}{2} \times [2 \times 4 + (5-1) \times 1] = 30$
Sum of first ten terms
= $\frac{10}{2} \times [2 \times 4 + 9 \times 1] = 85$
Required Ratio = $\frac{30}{85} = \frac{6}{17}$

Sol.54.(a) A is 80% more than B ⇒ A : B = 9 : 5 = 36 : 20 ; and
B is 20% less than C ⇒ B : C = 4 : 5 = 20 : 25 ;
So , A : B : C = 36 : 20 : 25 ;

Sol.55.(b) $\frac{13}{18}$ of the residents of a housing society own cars If there are 18 residents then 13 have own cars $\frac{48}{65}$ of the car owners have purchased covered parking space If 65 have own cars then 48 have purchased parking space
Residents : own cars : parking space
18 13
65 48
_____
$18 \times 65 : 13 \times 65 : 13 \times 48$ or 90 : 65 : 48
Number of residents who park their car in the open = 65 - 48 = 17
17 unit = 136
No. of residents = $\frac{136}{17} \times 90 = 720$

Sol.56.(d) 1 dozen = 12 article
Only option (d) is possible because the sum option (5 : 1) is equal to 12.

Sol.57.(c) Continued proportion :-
an ordered set of numbers such that the ratio between any two successive terms is the same
Therefore (7, 21, 63) → (7, 7 × 3 ,21 × 3) and (2.4, 9.6, 38.4) →(2.4, 2.4 × 4, 9.6 × 4) is in the continued proportion.

Sol.58.(d) Balancing the given ratio, we have:
Red : Green
Initial balls $4_{\times 2}$: $9_{\times 2}$ = 8 : 18
Final balls $5_{\times 3}$: $6_{\times 3}$ = 15 : 18
ATQ, 7 unit i.e.(15 - 8) = 7 Then, 18 unit = 18.
So, the no of green balls in the bag = 18.

Sol.59.(d) As , we know that
Total cost = No. of quantity × Price
Pen : Pencil : Eraser
Quantity ⇒ 3x : 2x : 1x
Price ⇒ 3 : 2 : 2

Total cost ⇒ 9x + 4x + 2x = 90 Rs.
⇒ 15x = 90 Rs. ⇒ 1x = 6 ⇒ 3x = 18

Sol.60.(b) According to question ,
Ratio of gift got by children are:-
Child 1 : Child 2 : Child 3 : Child 4
2 : 1
3 : 1
4 : 1
Now, equating ratio
Child 1 : Child 2 : Child 3 : Child 4
12 : 6 : 4 : 3
Now, 25 unit = 875 ⇒ 1 unit = 35
then, 18 unit = 630

Sol.61.(a) 6 : 18 :: 39 : x
x = $\frac{18 \times 39}{6}$ = 117

Sol.62.(c)
a b c
2 : 3
3 : 4
_____
2 : 3 : 4

Sol.63.(c) Let the numbers be 7x and 3x.
$7x - 3x = 52$
$\Rightarrow 4x = 52 \Rightarrow x = 13$
Greater number = 7x = 7 x 13 = 91

Sol.64.(c) Let the chocolates are in the ratio 7x and 5x
$7x - 5x = 28$
$2x = 28 \Rightarrow x = 14,$
Number of chocolates in the larger box = 7x = 98

Sol.65.(a) 40 : 35 :: 35 : x
$\Rightarrow 40x = 35 \times 35 \Rightarrow x = \frac{1225}{40} = \frac{245}{8}$

Sol.66.(b) According to the question,
First part : second part
3 : 4
Total wire= 3 + 4 = 7 units
7 units → 91 m
so , 1 unit → 13
Therefore
Shorter piece = 13 × 3 = 39 cm

Sol.67.(c) Let the numbers are 5x and 3x
Now, $5x - 3x = 54$
$\Rightarrow 2x = 54 \Rightarrow x = 27$
Smaller number = 3x = 3 × 27 = 81

Sol.68.(b) $\sqrt{pq} = 8$
$\Rightarrow pq = 8^2 = 64.$
Hence, p and q should be 16 and 4.

Sol.69.(c) Mean proportional of 16 and 144 = $\sqrt{16 \times 144} = 48$

Sol.70. (c) Third proportion = $\frac{b^2}{a}$

$= \frac{50 \times 50}{10} = 250$

Sol.71.(a) 12 : 24 :: 45 : x

x = $\frac{24 \times 45}{12} = 90$

Sol.72.(d) 3a = 4b…(1)

3a + 2b = 24

$\Rightarrow 4b + 2b = 24 \Rightarrow 6b = 24$

$\Rightarrow b = 4\ then\ 3a = 16 \Rightarrow a = \frac{16}{3}$

Sol.73.(a

$x : y = 7 : 3,\ then\ (x^2 + y^2) : (x^2 - y^2)$

$= 58 : 40\ or\ 29 : 20$

Sol.74.(a) $4a + 7 : 11a + 3 :: 6a : x$

when a = 2

15 : 25 :: 12 : x$\Rightarrow x = \frac{25 \times 12}{15} = 20$

Sol.75.(d)

2 : 5

3 ×2→ 6

Initial amount = 7 × 2 = ₹14

Sol.76.(c) Mean proportion =

$\sqrt{ab} = \sqrt{17 \times 68} = 34$

Sol.77.(d) According to the question,

A : B : C : D = 4 : 7 : 9 : 3

Difference between amount of C and B

= (9 - 7) units = 800 ⇒ 2 units = 800

so, 1 unit = 400

Therefore, Amount of D = 3 units =

400 × 3 = ₹1200

Sol.78.(a) $\frac{2x + 7y}{4x - 3y} = \frac{8}{3}$

⇒ 6x + 21y ⇒ 32x - 24y ⇒ 26x = 45y

So, x : y = 45 : 26

Sol.79.(a) Let the number of boys be x, then number of girls be $\frac{3x}{7}$

x + $\frac{3x}{7}$ = 40 ⇒ $\frac{10x}{7} = 40 \Rightarrow x = 28$

Hence, the number of boys = 28

Sol.80.(c)

Boys Girls

7 : 9

×21 ×21

147 189

Sol.81.(b)

$49 : x :: x : 81 \Rightarrow x^2 = 49 \times 81$

$\Rightarrow x = \sqrt{49 \times 81} = 63$

$64 : y :: y : 169 \Rightarrow y^2 = 64 \times 169$

$\Rightarrow y = \sqrt{64 \times 169} = 104$

$2x + 3y = 2 \times 63 + 3 \times 1048$

$= 126 + 312 = 438$

Sol.82.(b) Let the one part be x and the other part be (x + 10)

$\frac{x + 10}{x} = \frac{4}{3} \Rightarrow 3x + 30 = 4x \Rightarrow x = 30$

Hence, initial number = x + x + 10

= 2 × 30 + 10 = 70

Sol.83.(d)

$144 : b :: b : 36 \Rightarrow b^2 = 144 \times 36$

$\Rightarrow b = \sqrt{144 \times 36} = 72$

Sol.84.(a) $7 : 12 :: 21 : x$

$\Rightarrow x = \frac{12 \times 21}{7} = 36$

Sol.85.(b) Let the numbers are 2x and 7x.

$\frac{2x + 14}{7x - 6} = \frac{4}{3} \Rightarrow 6x + 42 = 28x - 24$

$\Rightarrow 28x - 6x = 42 + 24$

$\Rightarrow 22x = 66 \Rightarrow x = 3$

Sum of the numbers = 2x + 7x = 6 + 21

= 27

Sol.86.(a) 1.6 : 0.6 :: 0.6 : x

$\Rightarrow x = \frac{0.6 \times 0.6}{1.6} = 0.225$

Sol.87.(b)

a : b : c

7 : 9

15 : 7

105 : 135 : 63

35 : 45 : 21

a : b : c = 35 : 45 : 21

Sol.88.(c)

$3.2 : x :: x : 16.2 \Rightarrow x^2 = 3.2 \times 16.2$

$\Rightarrow x = \sqrt{3.2 \times 16.2} = 7.2$

Sol.89.(d)

Let initial salary of A and B be 3x and 4x

ATQ,

$\frac{3x + 3000}{4x + 3000} = \frac{18}{23}$

⇒ 69x + 69000 = 72x + 54000

⇒ 3x = 15000

So x = 5000

Initial salary of A = 5000 × 3 ⇒ 15000

Therefore , increased salary of A = 15000 + 3000 = 18000

Sol.90.(d) Given,

A : B

7 : 5

Share of B = $\frac{2400}{12}$ × 5

⇒ 200 × 5 = ₹1000

Sol.91.(a) Let the numbers are $7x$ and $5x$

$7x + 5x = 360$

$\Rightarrow 12x = 360 \Rightarrow x = 30$

Difference of the numbers

$= 7x - 5x = 2x = 2 \times 30 = 60$

Sol.92.(a) Let the number of chocolates A get be 4x and B get be 5x

$4x + 5x = 63 \Rightarrow 9x = 63 \Rightarrow x = 7$

B will get 5x = 7 × 5 = 35 chocolates.

Sol.93.(b) Let the two numbers be x and y

$\frac{x + y}{x - y} = \frac{8}{3} \Rightarrow 3(x + y) = 8(x - y)$

$\Rightarrow 3x + 3y = 8x - 8y$

$\Rightarrow -5x = -11y \Rightarrow \frac{x}{y} = 11 : 5$

Sol.94.(b) Let the present ages of kamal and Kiran be 4x and 5x

$4x + 6 = 30$

$\Rightarrow 4x = 30 - 6 \Rightarrow 4x = 24 \Rightarrow x = 6$

Hence, the present age of Kiran = 5x =

5 × 6 = 30 years.

Sol.95.(b)

13 : 12 :: x : 60 $\Rightarrow x = \frac{13 \times 60}{12} = 65$

Sol.96.(a) $\frac{196}{0.196} = \frac{19.6}{n}$

$\Rightarrow 196n = 0.196 \times 19.6 \Rightarrow n$

$= \frac{0.196 \times 19.6}{196} = 0.0196$

Sol.97.(b)

$2 : 3 :: 8 : y \Rightarrow y = \frac{3 \times 8}{2} = 12$

Sol.98.(d) 361 : y :: y : 121

$\Rightarrow y^2 = 361 \times 121 \Rightarrow y = \sqrt{361 \times 121} = 209$

Sol.99.(a) Let the greater part be 5x and smaller part be 3x

So, Amount in the greater part = $\frac{5}{8} \times 1368 = ₹855.00$

Sol.100.(a)

14 : y :: 7 : 8 $\Rightarrow y = \frac{14 \times 8}{7} = 16$

Sol.101.(d) As per question,

16 : y :: y : 25 $\Rightarrow \frac{16}{y} = \frac{y}{25}$

$y^2 = 16 \times 25 \Rightarrow y = 20$

Sol.102.(d) Ratio = $9^{3.5} : 3^5$

Ratio = $9^3 \times \sqrt{9} : 3^5 = 729 \times 3 : 243 = 9 : 1$

Sol.103.(a) As per question,

3x + 4x + 5x = 1344

⇒ 12x = 1344 = x = 112

Difference between largest and smallest shares = 5x - 3x = 2x = 2 × 112 = 224

Sol.104.(b) Ratio = 1 : 3 : 5

Total profit = 1 + 3 + 5 = 9 unit

Difference between largest and smallest = 5 - 1 = 4 unit
According to the question,
4 unit = 80,000 ⇒ 9 unit = 180,000
So, Total profit = 180,000

Sol.105.(b)
Total number of students = 162
Number of boys = 72
So, number of girls = 162 - 72 = 90
Ratio of number of girls to number of boys = 90 : 72 or 5 : 4

Sol.106.(c) Ratio of the money distribution among A, B and C = 3 : 2 : 1
$\frac{1}{3} = 9:6:4$
Now, (A - B) ; $3 \rightarrow 1500$
then , C's share = $4 \rightarrow$ ₹2,000

Sol.107.(b) Given, x : a :: a : y ⇒ $\frac{x}{a} = \frac{a}{y}$
⇒ xy = a^2 —------ (i)
$(x + z)^2 : (y + z)^2 :: x : y$,
$\frac{(x+z)^2}{(y+z)^2} = \frac{x}{y}$
$y(x + z)^2 = x(y + z)^2$
$y(x^2 + 2xz + z^2) = x(y^2 + z^2 + 2yz)$
$x^2y + 2xyz + z^2y = xy^2 + xz^2 + 2xyz$
$x^2y + yz^2 = xy^2 + xz^2$
$x^2y - xy^2 = yz^2 - xz^2$
⇒ $xy(x - y) = z^2(x - y)$
Therefore, $xy = z^2$ —-------- (ii)
From equation (i) and (ii)
$a^2 = z^2$ ⇨ a = z

Sol.108.(c) A : B = (3 : 4) × 1
B : C = (2 : 3) × 2 ⇒ A : B : C = 3 : 4 : 6
Then, A : C = 1 : 2

Sol.109.(a)A : B = 4 : 5 and B : C = 3 : 4

A	:	B	:	C
4		5		
		3		4
12	:	15	:	20

Hence, ratio of A and C = 12 : 20 or 3 : 5

Sol.110.(c) given,
Boys : girls = 7 : 9
Total student (7 + 9) = 16 unit → 480
1 unit → 30
So, number of boys = 30 × 7 = 210
Number of girls = 30 × 9 = 270
Therefore ,New ratio = 210 : 273
= 10 : 13

Sol.111.(d)
Let the two numbers be 5x and 3x.
$5x - 3x = 34 \Rightarrow 2x = 34 \Rightarrow x = 17$
Hence, the smaller number is 51.

Sol.112.(c) Ratio of two parts = 7 : 5
Difference = 7 - 5 = 2 unit
Total sum = 7 + 5 = 12 unit
According to the question,
2 unit = 14 ⇒ 12 unit = 84
So, required number = 84

Sol.113.(d) Ratio of two numbers = 5 : 7
Sum of numbers = 108
According to the question,
5x + 7x = 108 ⇒ x = 9
Hence, smaller number = 5x = 5 × 9 = 45

Sol.114.(b) According to the question,
$\frac{20}{38} = \frac{40}{x}$ ⇒ x = 76

Sol.115.(a) Let the second part = x
Then the first part = 3x + 2
According to the question,
3x + 2 + x = 150 ⇒ 4x + 2 = 150
4x = 148 ⇒ x = 37
Second part(x) = 37

Sol.116.(d) According to the question,
$\frac{a}{24} = \frac{24}{b}$ ⇒ ab = 576 ⇒ a = $\frac{576}{b}$
Again, $\frac{a}{b} = \frac{b}{192}$
$b^2 = 192a \Rightarrow b^2 = 192 \times \frac{576}{b}$
$b^3 = 192 \times 576 \Rightarrow b^3 = 8 \times 24 \times 24 \times 24$
b = 48
a = $\frac{576}{48}$ = 12
Hence, (a + b) = 12 + 48 = 60

Sol.117.(c) Let total notes = 3x
According to question,
50x + 100x + 200x = 5250
350x = 5250 ⇒ x = 15
Total notes = 3x = 3 × 15 = 45

Sol.118.(b) i = $\frac{7}{3}$j
i : j = 7 : 3 j = $\frac{4}{5}$k
j : k = 4 : 5
On balancing the ratio,
i : j : k = 28 : 12 : 15

Sol.119.(a) $\frac{2}{3}$ of y = $\frac{8}{15}$ of z
$\frac{2}{3} \times y = \frac{8}{15} \times z \Rightarrow y : z = 4 : 5$

Sol.120.(d) $\frac{11-k}{15-k} = \frac{20-k}{30-k}$
(11 - k) × (30 - k) = (15 - k) × (20 - k)
330 - 11k - 30k + k^2 = 300 - 15k - 20k + k^2
30 - 6k = 0 ⇒ k = 5
Mean proportion of (2k +2) and $3k^2$ = $\sqrt{(2 \times 5 + 2) \times (3 \times 5 \times 5)}$
= $\sqrt{36 \times 25}$ = 30

Sol.121.(d) $\frac{1}{3}$ × Ram = $\frac{2}{5}$ × Rahim
⇒ $\frac{Ram}{Rahim} = \frac{6}{5}$
Total money = (6 + 5) = 11 units = 1210 Rs
1 unit = 110
Rahim's money = 5 × 110 = 550 Rs

Sol.122.(c)
Let the total marble = 15 unit
Number of marbles which sunita won = 9 unit
Number of marbles which Ravi won = (15 - 9) × $\frac{2}{3}$ = 4
Remaining marble = 15 - 9 - 4 = 2 unit
As per question,
2 unit = 60 ⇒ 9 unit = 270
So, Number of marbles which sunita won = 270

Sol.123.(b) Length ratio = 7 : 11
Total length = 7 + 11 = 18 unit
As per question,
7 unit = 77 cm ⇒ 18 unit = 198 cm
So, length of unbroken stick = 198 cm or 1.98 m

Sol.124.(b) As per question,
A : B = 2 : 3
B : C = 4 : 3
On balancing the ratio,
A : B : C = 8 : 12 : 9
As per question,
8 unit = 88 ⇒ 9 unit = 99
So, price of item C = 99

Sol.125.(d) As per question,
$\frac{x+1}{x+5} = \frac{x+17}{x+53}$
By hit and trial method, put x = 1
$\frac{1+1}{1+5} = \frac{1+17}{1+53} \Rightarrow \frac{1+1}{1+5} = \frac{1+17}{1+53}$
$\frac{1}{3} = \frac{1}{3}$ (Satisfy)
(x + 5) = 1 + 5 = 6 and
(9x - 1) = 9(1) - 1 = 8
Mean proportional = $\sqrt{6 \times 8}$ = 4√3

Sol.126.(d) As per question,
$\frac{5x - 35400}{7x - 48600} = \frac{2}{3}$
15x - 1,06,200 = 14x - 97,200
x = 9,000
Difference between the income of B and A = 7x - 5x = 2x = 2 × 9000 = 18000

Sol.127.(a) Let the total number of female employees = 72 unit
Male employee = 72 × $\frac{3}{8}$ = 27 unit
Total number of employee = 72 + 27 = 99 unit
Number of males who are Non graduates = $\frac{1}{3}$ × 27 = 9 unit
Number of females who are non graduates = 72 × $\frac{4}{9}$ = 32 unit

Total number of employee who are non graduates = 32 + 9 = 41 unit
As per question,
41 unit = 164 ⇒99 unit = 396
So, Total number of employees in the office = 396

Sol.128.(d) A : B : C : D = 3 : 6 : 8 : 5
Total sum = 3 + 6 + 8 + 5 = 22 unit
Difference between B and C = 8 - 6 = 2 unit
As per question,
2 unit = 1000 ⇒ 22 unit = 11,000
Total amount of money = ₹11,000

Sol.129.(d) Length of the white pole= $\frac{9}{8+9+10} \times 405 = \frac{9}{27} \times 405 = 135\ m$

Sol.130.(d) Number of students who like chocolate D = $\frac{1}{10} \times 80 = 8$
Number of students who like chocolate E = $\frac{1}{20} \times 80 = 4$
Difference = 8 - 4 = 4

Sol.131.(a)
Income = Saving + Expenditure
⇒ 180000 = 63000 + 117000 (since, saving : expenditure = 7 : 13)
Now, Saving are distributed into Mutual funds and Equity
Saving = Mutual funds + Equity
63000 = 36000 + 27000 (since, Mutual funds : Equity= 4 : 3)
So, Amount saved in Mutual Funds= ₹36,000

Sol.132.(b) $\frac{Girls}{Boys} = \frac{3x}{4x}$
Required fraction
$= \frac{(\frac{2}{3} \times 3x) + (\frac{1}{2} \times 4x)}{3x + 4x} = \frac{2x + 2x}{7x} = \frac{4}{7}$

Sol.133.(b) Let Sachin has ₹ x and Sehwag has ₹ (950 - x)
$x + 250 = 950 - x$
$2x = 950 - 250 \Rightarrow x = \frac{700}{2} = 350$
Required ratio = (950 - 350) : 350 = 600 : 350 or 12 :7

Sol.134.(a) Let the number of boys be x then, number of girls = x+16
Now, $x + x + 16 = 64$
$2x = 64 - 16 \Rightarrow 2x = 48 \Rightarrow x = 24$
Required ratio = 24:64 or 3:8

Sol.135.(d) Out of Harish's monthly salary of Rs.45000 , $\frac{1}{3}$ are on education and $\frac{2}{6} = \frac{1}{3}$ are on food and other necessities.
So, the total expenditure
= 45000 × ($\frac{1}{3}$ + $\frac{1}{3}$) = 30000
i.e. the amount of savings =
45000 - 30000 = Rs. 15000

Sol.136.(d) Let the length of a rope = L and the rope is divided into three different parts.
The first part is $\frac{1}{5}$ of the whole length = $\frac{L}{5}$
The second part is $\frac{3}{2}$ of the first = $\frac{3L}{10}$
i.e. the third part is = L - ($\frac{L}{5}$ + $\frac{3L}{10}$) = $\frac{L}{2}$
So, the third part is $\frac{1}{2}$ fraction of the rope.

Sol.137.(b) The ratio of the train fare, bus fare and air fare between 2 places = 5 : 8 : 12
The ratio of the number of passengers travelled by them = 3 : 4 : 5
So, the total fare collected on a particular day for these modes of transportation for a single trip
= (5 × 3 + 8 × 4 + 12 × 5) = 107 units
= 1,07,000 [according to the question]
⇒ 1 unit = 1000
⇒ the total fare collected from the air passengers = 12 × 5 = 60 units
⇒ 60 units = 60 × 1000 = 60,000.

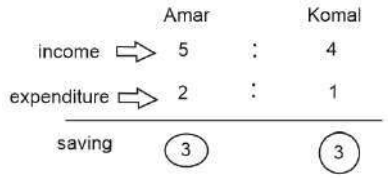
Sol.138.(d) A : B = (15 : 16) × 2 = 30 : 32
⇒ B : C = (8 : 25) × 4 = 32 : 100
⇒ C : D = (20 : 9) × 5 = 100 : 45
⇒ A : B : C : D = 30 : 32 : 100 : 45
⇒ A : D = 30 : 45 = 2 : 3

Sol.139.(b) Here $5x = 4y$,
$\frac{5x + 7y}{5x - 7y} + \frac{6x + 4y}{7x - 8y}$
$= \frac{4y + 7y}{4y - 7y} + \frac{6x + 5x}{7x - 10x}$
$= \frac{11}{-3} + \frac{11}{-3} = \frac{22}{-3}$

Sol.140.(b) In a game Rajesh lost $\frac{1}{3}$ of his money in the first round of the game,
So, money remaining after the first round = $\frac{2}{3}$
In the second round he losses $\frac{3}{5}$ of his remaining money ,
So, money remaining after the second round = $\frac{2}{3} - \frac{2}{3} \times \frac{3}{5} = \frac{4}{15}$
and in the third round he lost $\frac{4}{7}$ of the rest ,
So, money remaining after the third round = $\frac{4}{15} - \frac{4}{15} \times \frac{4}{7} = \frac{4}{35}$
i.e. he is left with $\frac{4}{35}$ parts of the original sum of money.

Sol.141.(d) In a firm, let male and female officers are 4x and 7x.
In another firm, let male and female officers are now 7y and 12y.
According to the question,
4x - 7y = 50 and 7x - 12y = 100
Solving these two equations, we get x = 100
i.e. the number of male officers in the first firm = 4x = 400

Sol.142.(a) The ratio of incomes of Amar and Komal = 5 : 4
∴ income of Amar = 5x
and income of Komal = 4x
Ratio of expenditure = 2 : 1
∴ expenditure of Amar = 2y and expenditure of Komal = y
Given, saving of each = 6,000
ATQ ,
5x - 2y = 6000 ----(1)
4x - y = 6000 ----(2)
On solving equation (1) and (2)
x = 2000
∴ Income of Amar = 5 × 2000 = 10,000
Short Tricks :-



According to question ,
3 units = 6000 Rs.
Then, 5 units = 10000 Rs.

Sol.143.(c) In 18 eggs, 3 are rotten , so good eggs = 15
Ratio of good eggs to rotten eggs = 5 : 1
Good eggs = 690 × $\frac{5}{6}$ = 575

Sol.144.(d) In a school, the number of boys and girls was in the ratio 5 : 7
Let the number of boys = 5x and girls = 7x.
Eight more boys were admitted during the session and the new ratio of girls and boys is now 1 : 1
⇒ $7x = 5x + 8 \Rightarrow 7x - 5x = 8$
So , in the beginning the difference between the number of boys and that of girls was 8.

Sol.145.(b) The ratio of shares of Rajeev, Kewal and Amit = 2 : 3 : 7
Difference of Amit's share and Kewal's share = 7 - 3 = 4
The value of 4 is given as Rs 15
Total = 12 whose value will be = 15 × 3

= Rs 45

Sol.146.(b) Ratio of expenditure – Tanveer : Yusuf : Sachin = 2 : 3 : 6
The fraction of the total expenditure by Yusuf = $\frac{3}{11}$

Sol.147.(b)
The ratio of male and female = 4 : 5
Let the male = 400 and female = 500
Male increases by 80%, 80% of 400 = 320
New number of males = 400 + 320 = 720
Females increase by 60% , 60% of 500 = 300
New number of females = 500 + 300 = 800
Ratio = $\frac{720}{800} = \frac{9}{10}$

Sol.148.(b) Every month Sunil saves $\frac{2}{17}$ of his monthly salary of Rs 51,000.
So, the amount that he saves every month = $\frac{2}{17} \times 51000 = 6000$

Sol.149.(a) Mean of class A + Mean of class B = $\frac{40 \times 23 + 45 \times 22}{85}$
= $\frac{920 + 990}{85} = \frac{1910}{85}$
Required ratio = $\frac{1910}{85 \times 23} = \frac{382}{391}$

Sol.150.(d)
Ratio of investment A B C
6 : 2 : 3
Share of B = $\frac{2}{11} \times 6600$ = Rs 1,200

Sol.151.(c) A/Q , $\frac{5-a}{6-a} < \frac{17}{22}$
⇒ 110 - 22a < 102 - 17a ⇒ 8 < 5a
⇒ a > $\frac{8}{5}$ = 1.6
Nearest smallest number (a) = 2

Sol.152.(a) Bhagat Ram's share
= $\frac{13}{23} \times 8050$ = Rs 4,550

Sol.153.(a)
Share of Anita = $1950 \times \frac{6}{13} = 900$
Share of Vineet = 1950 - 900 = 1050
New Ratio, 900 + 100 : 1050 + 100
= 1000 : 1150
= 20 : 23

Sol.154.(c) Let the numerator and denominator of the fraction are x and y.
If we increase numerator by 50%
New numerator = $x \times \frac{150}{100} = 1.5x$
And if we increase the denominator by 80%
New denominator = $y \times \frac{180}{100} = 1.8y$
Fraction = $\frac{1.5x}{1.8y} = \frac{5}{6} \times \frac{x}{y} = \frac{5}{6}$ times the original fraction.

Sol.155.(d) A : B = 3 : 5
B : C = 4 : 7
A : B : C = 3 × 4 : 4 × 5 : 5 × 7
= 12 : 20 : 35

Sol.156.(c) As 15% of the boys (b) are the same in number as one-third of the girls (g) ;
$\Rightarrow \frac{3}{20}b = \frac{1}{3}g \Rightarrow b : g = 20 : 9$
The ratio of the number of boys to that of girls in the college is 20 : 9.

Sol.157.(d) a = $\frac{3}{7}$b ⇒ $\frac{a}{b} = \frac{3}{7}$
Then $\frac{8a-b}{2a+3b} = \frac{8 \times 3 - 7}{2 \times 3 + 3 \times 7} = \frac{17}{27}$

Sol.158.(b) If we increase 50% of numerator then numerator will becomes 150%
And if denominator increases by 80% it will be 180%
Ratio = $\frac{150\%}{180\%} = \frac{5}{6}$

Sol.159.(a) Let the income of Aamir and Ali are 5x and 3x respectively And their expenditures are 9y and 5y respectively.
A/Q ,
5x - 9y = 2600 ------ (1)
And 3x - 5y = 1800 ------ (2)
On solving equation (1) and (2) we get,
x = 1600 and y = 600
Incomes of Aamir and Ali are
= Rs 8000 and Rs 4800

Sol.160.(a) Let the numbers be 2x and 3x.
A/Q ,
$\Rightarrow 20 + \frac{2x}{5} = \frac{3x}{10} + 25$
$\Rightarrow \frac{2x}{5} - \frac{3x}{10} = 5 \Rightarrow \frac{x}{10} = 5 \Rightarrow$ x = 50
The smaller number = $2 \times 50 = 100$

Sol.161.(c) Let $\frac{1}{3}A = \frac{1}{4}B = \frac{1}{5}C = k$
Then A : B : C = 3k : 4k : 5k = 3 : 4 : 5

Sol.162.(b) $\frac{a^3+b^3}{a^3-b^3} = \frac{185}{158}$
Using componendo and dividendo we get :
$\frac{a^3}{b^3} = \frac{343}{27} \Rightarrow \frac{a}{b} = \frac{7}{3}$
Then a : b = 7 : 3 ;

Sol.163.(a) Seats for Mathematics, Physics and Chemistry in a school are in the ratio of 7 : 8 : 9.
Increments in those subjects are respectively 30% , 40% and 50%.
So, the final seat ratio will be
= (7 × 1.3) : (8 × 1.4) : (9 × 1.5)
= 9.1 : 11.2 : 13.5 = 91 : 112 : 135

Sol.164.(d) let x be subtracted
Then, according to question,
$\Rightarrow \frac{16-x}{19-x} = \frac{19-x}{23-x}$
Put , x = 7 $\Rightarrow \frac{9}{12} = \frac{12}{16} \Rightarrow \frac{3}{4} = \frac{3}{4}$
So , x = 7 is the correct answer.

Sol.165.(d) As Girls = $\frac{8}{15}$
Boys = $\frac{7}{15}$ ⇒ Girls : Boys = 8 : 7

Sol.166.(a) $\frac{A}{4} = \frac{B}{5} = \frac{C}{6}$
$\Rightarrow \frac{A}{B} = \frac{4}{5}$ and $\frac{B}{C} = \frac{5}{6}$
⇒ A : B : C = 4 : 5 : 6

Sol.167.(b) a : b = 5 : 3 and b : c = 3 : 7
B is same in both ratio ,
so that a : c = 5 : 7

Sol.168.(b) Let the number of boys = x
Number of girls = 7x
Total number of students = 8x
Number should be multiple of 8.
So, 52 cannot represent the total number of children in the class.

Sol.169.(d) Let the incomes of Barun and Anil = $12x$ and $13x$
Expenditure of Barun and Anil = $10y$ and $13y$
A/Q ,
$12x - 10y = 2100$ ---------- (1)
And $13x - 13y = 1300$
$x - y = 100$ ---------- (2)
On solving equations (1) and (2), we get,
$x = 550$ and $y = 450$
Income of Barun = $12 \times 550 = 6,600$
Income of Anil = $13 \times 550 = 7,150$

Sol.170.(c) Let the numbers be 6x and 8x.
A/Q ,
$\Rightarrow 6x \times 8x = 768 \Rightarrow 48x^2 = 768$
$\Rightarrow x^2 = \frac{768}{48} = 16 \Rightarrow x = 4$
Smaller number = $6 \times 4 = 24$

Sol.171.(c) x : y = 1 : 2 ⇒ y : z = 1 : 6
x : y : z = 1 : 2 : 12

Sol.172.(d) Let the number to be subtracted be x. Then ,

$\frac{(23-x)}{(40-x)} = \frac{(57-x)}{108-x)}$

For such type of questions, solve them by putting options in the equation

x = 6

$\Rightarrow \frac{(23-6)}{(40-6)} = \frac{(57-6)}{(108-6)} \Rightarrow \frac{1}{2} = \frac{1}{2}$

Sol.173.(c) Let, Time for 375 men = x

Equating both conditions because total provisions are the same in the army camp.

⇒ 425 × 30 = 375 × X ⇒ 12750 = 375 X

X = $\frac{12750}{375}$ ⇒ X = 34 days

Sol.174.(d) A : B : C = 2 : 3 : 1

Difference between A and C = 2 - 1

= 1 unit

⇒ 1 unit = 1200 ⇒ 2 unit = 2400

Share of A = 2400

Sol.175.(c) The notes of Rs 100, Rs. 50 and Rs. 10 = 5 : 8 : 10

Rs 50 in the bag = 3000 × $\frac{8}{1000}$ = 24

Sol.176.(d) The speeds of three cars are in the ratio = 5 : 6 : 10.

Total distance = LCM of (5 , 6 ,10) = 30

So that , Ratio of the time

= $\frac{1}{5} : \frac{1}{6} : \frac{1}{10}$ = 12 : 10 : 6

Sol.177.(d)

A : B : C : D

1 : 3

5 : 4

2 : 3

_____

10 : 30 : 24 : 36

5 : 15 : 12 : 18

Sol.178.(b) A : B : C = 5 : 2 : 8

Difference of shares of A and C = 3

3 unit = 7,740

Total amount = 15 unit

15 unit = $\frac{7740}{3} \times 15 = Rs\ 38,700$

Sol.179.(a) According to question ,

$\frac{l}{2(l+b)} = \frac{3}{20} = \frac{l}{(l+b)} = \frac{3}{10} = \frac{3}{3+7}$

$\Rightarrow b = 7 \Rightarrow \frac{l}{b} = \frac{3}{7}$

Sol.180.(a)

Ratio of income and expenditure = 9 : 5

Saving = 9 - 5 = 4 unit

A/Q , 9 unit = 27000

4 unit = $\frac{27000 \times 4}{9}$ = 12000 Rs

Sol.181.(b) Let , The Ratio of the number = 3x : 7x : 8x

Sum of their squares

= $(3x)^2 + (7x)^2 + (8x)^2 = 7808$

⇒ $(9 + 49 + 64)x^2 = 7808$

⇒ $122\ x^2 = 7808$ ⇒ x = 8

Now , smallest number = 3 × 8 = 24

Sol.182.(a) Compound Ratio

= $\frac{45 \times 3 \times 51 \times 256}{75 \times 5 \times 68 \times 81} = \frac{64}{75}$

Sol.183.(a) a : b :: 3 : 4

Now ,

$\Rightarrow \frac{5a-3b}{7a+2b} = \frac{5 \times 3 - 3 \times 4}{7 \times 3 + 2 \times 4} = \frac{3}{29}$

Sol.184.(a) If distance is equal, the ratio of time is opposite to the ratio of speed.

Ratio of time = $\frac{1}{2} : \frac{1}{3} : \frac{1}{5}$

Sol.185.(d) Given , x : y = 4 : 3

A/Q , $x^3 - y^3 : x^3 + y^3$

= $4^3 - 3^3 : 4^3 + 3^3$ = 37 : 91

Sol.186.(b) 35% of x = 30% of y

$\Rightarrow 35x = 30y \Rightarrow \frac{x}{y} = \frac{30}{35} = \frac{6}{7}$

Sol.187.(a) Let the numbers be a and b,

A/Q, a + b = 80 _____ (1)

And a - b = 8 _____(2)

On solving equation (1) and (2), we get

a = 44 and b = 36

Now , $\frac{a}{b} = \frac{44}{36} = \frac{11}{9}$

Sol.188.(b) John, Sarah, Tom and Joane bought 3 pizzas of the same size in all

John ate $\frac{2}{4}$ of a pizza means his left

size of pizza = $\frac{2}{4}$

Sarah, Tom and Joane ate $\frac{3}{4}$ of a pizza each means

Sarah ,Tom and Joane left size of pizza

= $\frac{1}{4}$, $\frac{1}{4}$, $\frac{1}{4}$

So that , $\frac{1}{4}$ pizza was left.

Sol.189.(c) Let , one rupee, 50 paise and 25 paise coins in the ratio 1x : 2x : 3x

The value of one rupee = 1x

The value of 50 paise = 0.5 × 2x = 1x

The value of 25 paise = 0.25 × 3x = $\frac{3}{4}$x

Then , total value = 1x + 1x + 0.75x = 2.75x

Now , 2.75 x = 110 ⇒ x = 40 ,

50 paise coins = 2 × 40 = 80

Sol.190.(b) Let , number = x

according to question ,

⇒ $\frac{7+x}{9+x} = \frac{13}{14}$ ⇒ 98 + 14x

= 117 + 13x ⇒ x = 19

Sol.191.(b) a : b = 3 : 4

b : d = 3 : 4

a : b : d = 9 : 12 : 16 ⇒ a : d = 9 : 16

Sol.192.(d)

Maddy reads = $\frac{3}{5} \times 75 = 45$ pages

Remaining pages = 75 - 45 = 30

Sol.193.(d) Let the salary of A and B = 400 and 500 respectively

A's salary got increased by 10%

New salary of A = 400 + 40 = 440

B's salary got increased by 20%

New salary of B = 500 + 100 = 600

Ratio = 440 : 600 = 11 : 15

Sol.194.(a) Let , number = X

A/Q ,

⇒ X × $\frac{3}{7} \times \frac{1}{4} \times \frac{2}{5}$ = 15 ⇒ X = 350

Half of the Number = $\frac{350}{2}$ = 175

Sol.195.(c) Hour hand travels 30° in 1 hour = 60 min

But minute hand travels 30° in 5 minutes

Ratio of velocities of hour hand and minute hand = 5 : 60 = 1 : 12

Sol.196.(a) Ratio of Boys and girls = 7 : 3

10 unit = 500

Boys = 7 unit = 350

Girls = 3 unit = 150

Number of girls after new enrollment

= 150 + 120 = 270

Ratio of boys to girls = 350 : 270 = 35 : 27

Sol.197.(a)

X : Y = 4 : 5

Y : Z = 5 : 7

Z : W = 7 : 9

_____

X : Y : Z : W = 4 : 5 : 7 : 9 ⇒ X : W = 4 : 9

Sol.198.(a)

Let the each number is reduced by x

$\frac{17-x}{21-x} = \frac{7}{9} \Rightarrow 153 - 9x = 147 - 7x$

$\Rightarrow 2x = 6 \Rightarrow x = 3$

Sol.199.(a) 10% of M = 20 % N

⇒ M : N = 2 : 1

Sol.200.(b) Ratio of coins = 3x : 4x : 5x

3x × 1 + 4x × 0.5 + 5x × 0.25 = 93.75

⇒ 6.25x = 93.75 ⇒ X = 15

One rupees coins = 45 , 50 paise coins = 60 , 25 paise coins = 75

Sol.201.(d)

Reading part of the book = $\frac{3}{8}$

Remaining part of the book = 1 - $\frac{3}{8}$ = $\frac{5}{8}$

The boy when reading $\frac{4}{5}$ of $\frac{5}{8}$ = $\frac{1}{2}$

Total part of reading = $\frac{3}{8}$ + $\frac{1}{2}$ = $\frac{7}{8}$

The unread part = $\frac{1}{8}$ = 30 pages

So that 8 unit (total pages on book)
= 30 × 8 = 240 pages

Sol.202.(d)
Boys and girls Ratio in class = 5 : 7
Difference between them = 6
2 unit = 6
12 unit = 36 student

Sol.203.(a) $\frac{a}{b}$ = $\frac{2}{3}$, $\frac{b}{c}$ = $\frac{3}{5}$

Now , $\frac{2+3+5}{5}$ = $\frac{10}{5}$ = 2.

Sol.204.(a) Let the number be x

$\Rightarrow (\frac{x}{2} + \frac{x}{3} + \frac{x}{5})$ - x = 12

$\Rightarrow \left(\frac{15x + 10x + 6x - 30x}{30}\right)$ = 12

$\Rightarrow \frac{x}{30}$ = 12 $\Rightarrow x = 12 \times 30 = 360$

Sol.205.(c) $\frac{1}{8}$ of a pencil is black

Let the total length of the pencil = 8
So 1 part is black
Half of remaining is yellow =
3.5 cm
Remaining 3.5 part is blue = 3.5 cm
3.5 unit = 3.5 cm
Length of the pencil = 8 unit = 8cm

Sol.206.(a) For proportion

$\Rightarrow \frac{30}{40} = \frac{45}{60} = \frac{3}{4}$

Sol.207.(c)
Ratio of capital in the respect of 1 year
= 12 month × 15000 : 10 month × 20000
Ratio of the capital A & B = ratio of the profit A & B = 9 : 10

Sol.208.(b)
One fourth part of a pencil is black
Let the length of pencil = 4 unit
1 unit = black
Remaining = 3 part
A/Q,
Green = 1.5
Yellow = 1.5
1 .5 unit = 1.5 cm
Length of the pencil = 4 unit = 4 cm

Sol.209.(a) Let the 1st number = x and second number = y
A/Q,

$\frac{25}{100} \times x = 3 \times \frac{50}{100} \times y$

$\Rightarrow \frac{x}{4} = \frac{3y}{2} \Rightarrow \frac{x}{y} = \frac{6}{1}$

Sol.210.(b) Let the numbers be 4x and 5x

$\Rightarrow \frac{4x+6}{5x+6} = \frac{6}{7}$

$\Rightarrow 28x + 42 = 30x + 36$

$\Rightarrow 2x = 6 \Rightarrow x = 3$

Smallest original number = $4 \times 3 = 12$

Sol.211.(a) In the given mixture ratio between gold and silver = 8 : 12
⇒ 8 unit = 30 kg
Total mixture = 20 unit = 75 kg

Sol.212.(b) Given , (m + n) : (m - n) = 7 : 3

$\frac{m}{n} = \frac{5}{2}$

Now , (m^3 + n^3) : (m^3 - n^3) = (5^3 + 2^3) : (5^3 - 2^3) = (125 + 8) : (125 - 8) = 133 : 117

Sol.213.(b) Ratio of time = 6 : 4 : 9
Ratio of daily wages = 5 : 6 : 4
Ratio of shares = 30 : 24 : 36
Share of A = $\frac{30}{90} \times 1800 = Rs\ 600$

Sol.214.(b) Sundari - $\frac{24}{60} = 40\%$ and $\frac{32}{40} = 80\%$ progress is 100%

Kasu - $\frac{35}{70} = 50\%$ and $\frac{54}{60} = 90\%$ progress is 80%

Jyothi - $\frac{27}{90} = 30\%$ and $\frac{45}{50} = 90\%$ progress is 200%

So Jyothi is most progressive

Sol.215.(d) Value of 3 unit = 42
Highest number = 8 unit = $\frac{42}{3} \times 8 = 112$

Sol.216.(b) 36% of x = 81% of y

$\Rightarrow 36x = 81y \Rightarrow \frac{x}{y} = \frac{81}{36} = \frac{9}{4}$

Sol.217.(a)
Let the numbers are = 9x and 5x
A/Q ,
9x + 9 = 3(5x - 5)
$\Rightarrow 9x + 9 = 15x - 15$
$\Rightarrow 6x = 24 \Rightarrow x = 4$
Numbers are = 36 and 20
Alternate method
Check by options
Option (a) 36,20 satisfy the question.

Sol.218.(c) $\frac{1}{3}$of A = $\frac{3}{4}$ of B

$\Rightarrow \frac{1}{3} \times A = \frac{3}{4} \times B \Rightarrow \frac{A}{B} = \frac{9}{4}$

And ,

$\frac{3}{4}$ of B = $\frac{1}{6}$ of C

$\Rightarrow \frac{3}{4} \times B = \frac{1}{6} \times C \Rightarrow \frac{B}{C} = \frac{4}{18}$

A : B : C = 9 : 4 : 18

Sol.219.(b)
Ratio of fruits distributed between them
A : B : C : D = 3 : 4 : 5 : 7
Given that 3 unit = 192 fruits
B and C together = 9 unit
= $\frac{192}{3} \times 9 = 576$

Sol.220.(d) ($3a^2$ - $8b^2$) : (a^2 + $4b^2$) = 2 : 1

$\Rightarrow \frac{(3a^2 - 8b^2)}{(a^2 + 4b^2)} = \frac{2}{1}$

$\Rightarrow 3a^2 - 8b^2 = 2a^2 + 8b^2 \Rightarrow a^2 = 16b^2$

$\Rightarrow \frac{a^2}{b^2} = \frac{16}{1} \Rightarrow \frac{a}{b} = \frac{4}{1}$

Sol.221.(a) A/Q ,
Let share of C = x, share of B = x + 9, share of A = x + 14
ATQ,
⇒ x + 14 + x + 9 + x = 50
⇒ 3x = 27 ⇒ x = 9
A : B : C = 23 : 18 : 9

Sol.222.(b)
Let the numbers be 9x and 11x
A/Q ,

$\Rightarrow \frac{9x - 4}{11x - 4} = \frac{7}{9}$

$\Rightarrow 81x - 36 = 77x - 28$

$\Rightarrow 4x = 8 \Rightarrow x = 2$

Sum of both numbers
= 9x + 11x = 20x = $20 \times 2 = 40$

Sol.223.(a) $\frac{1.2}{y} = \frac{3.6}{4.8}$

y = $\frac{1.2 \times 4.8}{3.6} = \frac{8}{5}$

Sol.224.(b) The students in three classes are in the ratio 2x : 3x : 5x
Final ratio of the students in three classes is
(2x + 30) : (3x + 30) : (5x + 30) = 4 : 5 : 7
Equating them --

$\Rightarrow \frac{2x + 30}{3x + 30} = \frac{4}{5} \Rightarrow$ 10x + 150 = 12x + 120 ⇒ 2x = 30 ⇒ x = 15

The total number of students after the increase =
{ 2 × 15 + 30} + { 3 × 15 + 30} +
{ 5 × 15 + 30} = 60 + 75 + 105 = 240

Sol.225.(b) Let the number added = x
A/Q ,

$\Rightarrow \frac{7 + x}{11 + x} = \frac{4}{5}$

$\Rightarrow 35 + 5x = 44 + 4x \Rightarrow x = 9$

Sol.226.(a) 15% = $\frac{3}{20}$ and 20% = $\frac{1}{5}$

Ratio of income of A and B = 23 : 20
Ratio of income of B and C = 4 : 5
$\Rightarrow 20 : 25$
A : B : C = 23 : 20 : 25

Sol.227.(c) 0.02x = 0.5y
$\Rightarrow \frac{x}{y} = \frac{0.5}{0.02} = \frac{50}{2}$
Now ,
$\Rightarrow \frac{x-y}{x+y} = \frac{50-2}{50+2} = \frac{48}{52} = \frac{12}{13}$

Sol.228.(a) Let the boys = 7x
Girls = 5x
A/Q ,
5x + 7x = 60 $\Rightarrow 12x = 60 \Rightarrow x = 5$
Number of boys = $7 \times 5 = 35$
Number of girls = 60 - 35 = 25
Ratio of boys to girls = (35 - 5) : 25
$\Rightarrow 30 : 25 \Rightarrow 6 : 5$

Sol.229.(c) Let the numbers = x and y
A/Q ,
$\Rightarrow \frac{3}{100}x + \frac{2}{100}y$
$= \frac{3}{4}(\frac{3}{100}x + \frac{5}{100}y)$
$\Rightarrow 3x + 2y = \frac{3}{4}(3x + 5y)$
$\Rightarrow 12x + 8y = 9x + 15y$
$\Rightarrow 3x = 7y \Rightarrow \frac{x}{y} = \frac{7}{3}$

Sol.230.(c) A = $\frac{2}{3}$ B And B = $\frac{1}{3}$ C
$\Rightarrow \frac{A}{B} = \frac{2}{3}, \frac{B}{C} = \frac{1}{3}$
A : B = 2 : 3
B : C = 1 : 3
A : B : C = 2 : 3 : 9

Sol.231.(a) A : B = 5 : 4
B : C = 7 : 10
A: B : C = 35 : 28 : 40
Ratio of A and C
A : C = 35 : 40 = 7 : 8

Sol.232.(c)
one number is $\frac{1}{15}$ th of the other
Let one number = 15x
Other number = x
Product of numbers = $15x^2 = 0.60$
$\Rightarrow x^2 = \frac{0.60}{15} = \frac{4}{100}$
$\Rightarrow x = \frac{2}{10} = \frac{1}{5} = 0.2$
Numbers are = 0.2 and 3.0

Sol.233.(a)
Ratio of profit = Capital $\times$ $Time$
Ratio of profit
A : B : C = $20 \times 6 : 16 \times 6 : 15 \times 3$
$= 120 : 96 : 45 = 40 : 32 : 15$
A/Q ,
$\Rightarrow$ (40 + 32 + 15) = 87 unit = Rs 4350
Share of B = 32 unit = $\frac{4350}{87} \times 32$
= Rs 1600

Sol.234.(d) Let , the numbers are = X and Y
A/Q , X × Y = 64
X + Y = 20 ------ (i)
$\Rightarrow (X + Y)^2 = X^2 + Y^2 + 2XY$
$\Rightarrow (20)^2 = X^2 + Y^2 + 2 \times 64$
$\Rightarrow 400 = X^2 + Y^2 + 128$
$\Rightarrow X^2 + Y^2 = 272$
Now ,
$\Rightarrow (X - Y)^2 = X^2 + Y^2 - 2XY$
$\Rightarrow (X - Y)^2 = 272 - 2 \times 64$
$\Rightarrow (X - Y)^2 = 144$
X - Y = 12 ---------(ii)
From equation (i) and (ii)
$\Rightarrow$ 2 X = 32 $\Rightarrow$ X = 16
And Y = 4
Ratio = 4 : 1

Sol.235.(a) x : y = 2 : 3
Putting the value of x and y in
(4x + 3y) : (2x + 5y)
$\Rightarrow$ (4x + 3y) : (2x + 5y)
= (4 × 2 + 3 × 3) : (2 × 2 + 5 × 3)
$\Rightarrow$ (4x + 3y) : (2x + 5y) = (8 + 9) : (4 + 15)
$\Rightarrow$ (4x + 3y) : (2x + 5y) = 17 : 19

Sol.236.(a) 5A - 2B = 0
5 A = 2 B
A : B = 2 : 5
And 4B = 5C
B : C = 5 : 4
So that , A : B : C = 2 : 5 : 4
Hence , C : A = 4 : 2 = 2 : 1

Sol.237.(d) $\frac{a}{3} = \frac{b}{4} = \frac{c}{7}$
$a : b : c = 3 : 4 : 7$
Now ,
$\Rightarrow \frac{a+b+c}{c} = \frac{3+4+7}{7} = \frac{14}{7} = 2$

Sol.238.(c) 10% of x = 15% of y
$\Rightarrow \frac{1}{10}x = \frac{3}{20}y \Rightarrow \frac{x}{y} = \frac{3}{2} \Rightarrow$ x : y = 3 : 2

Sol.239.(b) In 1 hour = 3600 seconds
$\Rightarrow \frac{1}{3600} = 0.00027$

Sol.240.(c) Let the price of each chair = x
Price of each table = y
A/Q ,
2x + y = 880 ___ (1)
x + 2y = 980 ___ (2)
On solving equation (1) and (2) we get ,
x = 260 and y = 360

Sol.241.(d) Ratio of speed, A : B = 2 : 1
Ratio of speed, B : C = 3 : 1
A : B : C = 6 : 3 : 1
Ratio of time , A : B : C = 1 : 2 : 6
A/Q ,
6 unit = 54 minutes
Time of A = 1 unit = 9 minutes

Sol.242.(c) Rs. 825 is divided into three parts in a proportion of $\frac{1}{3} : \frac{4}{9} : \frac{3}{4}$
= 12 : 16 : 27 ;
Then the first part will be = $825 \times \frac{12}{55}$
$= 180$Rs.

Sol.243.(b) Here, A and B invested Rs. 20,000 and 16,000 respectively for 6 months.
And C joined them with 15,000 for the last 3 months.
So the ratio of invested money = 20×6 : 16×6 : 15×3 = 40 : 32 : 15 ;
Then the share of B from the half yearly profit of 4100 Rs. is
$= 4100 \times \frac{32}{87} = 1508.04$

Sol.244.(c) 1 cm = 20 units
4.7 cm = $4.7 \times 20 = 94$ $units$

Sol.245.(d) $\frac{a}{b} = \frac{4}{3}$
Here a = 4 and b = 3
Now,
$\frac{6a+2b}{4a-2b} = \frac{6\times4+2\times3}{4\times4-2\times3} = \frac{30}{10} = 3$

Sol.246.(b) Let the mean proportion = x
$\frac{169}{x} = \frac{x}{121} \Rightarrow x^2 = 169 \times 121$
$\Rightarrow x = 13 \times 11 = 143$

Sol.247.(d) 50% of x = 25% of y
$\Rightarrow \frac{1}{2}x = \frac{1}{4}y \Rightarrow \frac{x}{y} = \frac{1}{2}$

Sol.248.(a) Let the numbers be 2x and 3x
A/Q ,
$\Rightarrow \frac{2x+20}{3x+20} = \frac{3}{4}$
$\Rightarrow 8x + 80 = 9x + 60 \Rightarrow 20 = x$
Numbers are = 40 and 60

Sol.249.(b)
Let the number of coins of Rs 2 = x
So, the number of coins of Rs 5 = 60 - x
A/Q ,
Total amount = Rs 240
$\Rightarrow$ 2x + (60 - x) × 5 = 240
$\Rightarrow 2x + 300 - 5x = 240$
$\Rightarrow -3x = -60 \Rightarrow x = 20$
Number of Rs 2 coins = 20
Number of Rs 5 coins = 60 - 20 = 40

Sol.250.(d) 12 girl leave the group , then Ratio of the Boys and Girl = 2 : 1
30 boys leaves the group , then Ratio of the Boys and Girl = 1 : 3

Note - Girl are same in the initial and final ratio
Hence , (2 : 1) x 3 = 6 : 3
(1 : 3) x 1 = 1 : 3
difference of the boys → 5 unit
= 30 boys
So that , 1 unit = 6
initial number of boys and girls in the group = 36 boys and 18 girl + 12 girl
= 36 boys and 30 Girls

Sol.251.(c) 1m = 6 pieces
33.5 m = $\frac{33.5 \times 6}{1}$ = 201 pieces

Sol.252.(c) Let mean proportion = x
$\frac{8+3\sqrt{3}}{x} = \frac{x}{16-6\sqrt{3}}$
$\Rightarrow x^2 = (8 + 3\sqrt{3})(16 - 6\sqrt{3})$
$\Rightarrow x^2 = 2(8 + 3\sqrt{3})(8 - 3\sqrt{3})$
$\Rightarrow x^2 = 2\,[8^2 - (3\sqrt{3})^2]$
$\Rightarrow x^2 = 2(64 - 27) = 74 \Rightarrow x = \sqrt{74}$

Sol.253.(b)
Ratio of the cost of car and bike = 3 : 2
Difference of the cost of bike and car = 1 unit
⇒ 1 unit = 15000 Rs
Then , cost price of bike = 2 unit
= 30000 Rs

Sol.254.(c) x : y = 3 : 5
Now ,
$\Rightarrow \frac{5x-3y}{10x+6y} = \frac{5\times3-3\times5}{10\times3+6\times5} = 0$

Sol.255.(b) a : b = 3 :2
b : c = 3 : 5
a : b : c = 9 : 6 : 10
Now,
$\Rightarrow \frac{a+b}{b+c} = \frac{9+6}{6+10} = \frac{15}{16}$

Sol.256.(d) $\frac{a}{b} = 0.75 = \frac{3}{4}$
Now ,
$\Rightarrow \frac{2a+b}{2a-b} + \frac{4}{9} = \frac{2\times3+4}{2\times3-4} + \frac{4}{9}$
$= 5 + \frac{4}{9} = \frac{49}{9}$

Sol.257.(a) $\frac{a}{b} = \frac{b}{c} = \frac{c}{d}$
Let a = 2, b = 4, c = 8, d = 16
$\Rightarrow \frac{2}{4} = \frac{4}{8} = \frac{8}{16}$
$\Rightarrow \frac{b^3+c^3+d^3}{a^3+b^3+c^3} = \frac{4^3+8^3+16^3}{2^3+4^3+8^3}$
$= \frac{64+512+4096}{8+64+512} = 8 = \frac{d}{a}$

Sol.258.(b) 2.5x = 0.05y
$\Rightarrow \frac{x}{y} = \frac{0.05}{2.5} = \frac{1}{50}$
Now ,
$\Rightarrow \frac{y-x}{y+x} = \frac{50-1}{50+1} = \frac{49}{51}$

Sol.259.(a) Let 1 man earn x rs in 1 day and 1 woman can earn y Rs in 1 day.
A/Q ,
$\Rightarrow (2x + 3y) \times 7 = 49$
$\Rightarrow 2x + 3y = 7$ ___ (1)
And, $(3x + 6y) \times 8 = 96$
$\Rightarrow 3x + 6y = 12$
$\Rightarrow x + 2y = 4$ ___ (2)
On solving equation (1) and (2) , we get
$x = 2\ and\ y = 1$
1man + 1 woman can earn = 2 + 1 = 3 Rs per day
For 27 rs , no. of days required
$= \frac{27}{3} = 9$ days

Sol.260.(d)
Rama packs 36 boxes in = 1 hour
Her sister can pack same number of boxes = 3 hour
Time (Rama + her sister) = $\frac{1\times3}{1+3}$
$= \frac{3}{4}$ hour $= 45$ minutes.

Sol.261.(c) Let the income of A and B = 5x and 4x respectively
And expenditure of A and B = 3y and 2y
A/Q ,
5x - 3y = 1600 ___ (1)
4x - 2y = 1600 ____(2)
On solving both equations we get
x = 800 and y = 800
Income of A = 5x = $5 \times 800 = Rs\ 4000$

Sol.262.(b) A : B : C = 35 : 28 : 20 ⇒ 83
A/Q ,
⇒ 83 unit = 1162
⇒ 1 unit = $\frac{1162}{83} = 14$
Share of A = $35 \times 14 = Rs\ 490$
Share of B = $28 \times 14 = Rs\ 392$
Share of C = $20 \times 14 = Rs\ 280$

Sol.263.(c) Given , p : q = 9 : 2
⇒ (4p + 7q) : (4p - 7q)
= (4 × 9 + 7 × 2) : (4 × 9 - 7 × 2)
= (36 + 14) : (36 -14) = 25 : 11

Sol.264.(c) A: B = 2 : 3
B: C = 2 : 3
C : D = 3 : 4
A : B : C : D = 12 : 18 : 27 : 36
= 4 : 6 : 9 : 12
A : D = 4 : 12 = 1 : 3

Sol.265.(d) Let the numbers are x and y
A/Q , 40% of x = 12
$\Rightarrow \frac{40}{100} \times x = 12 \Rightarrow x = \frac{12\times100}{40} = 30$
And , 50% of y = 24
$\Rightarrow \frac{1}{2} \times y = 24$
$\Rightarrow y = 48$
⇒ x : y = 30 : 48 = 5 : 8

Sol.266.(a)
Let the numbers be x , 3x , and 4x.
A/Q ,
$x^2 + 9x^2 + 16x^2 = 2106$
$\Rightarrow 26x^2 = 2106 \Rightarrow x^2 = \frac{2106}{26} = 81$
$\Rightarrow x = 9$
Largest number = $4x = 4 \times 9 = 36$

Sol.267.(c) Let share of A,B and C be Rs.(3x + 5),(4x + 10) and (5x + 15)
Then Total amount = 3x + 5 + 4x + 10 + 5x + 15 ⇒12x + 30
According to the question
⇒12x + 30 = 2430
⇒12x = 2400 ⇒ x = 200
Share of C = (5x + 15) = (5 × 200 +15)
= 1015 Rs.

Sol.268.(b) Let the Rs 10 notes = x
Number of 500 rs notes = $\frac{x}{4}$
Number of rs 50 notes = $\frac{x}{2}$
Number of rs 20 notes = $\frac{x}{8}$
Total number of notes
$= x + \frac{x}{4} + \frac{x}{2} + \frac{x}{8} = \frac{15x}{8}$
A/Q ,
$\Rightarrow 10x + 500 \times \frac{x}{4} + 50 \times \frac{x}{2} + 20 \times \frac{x}{8} = 13000$
$\Rightarrow 10x + 125x + 25x + 2.5x = 13000$
$\Rightarrow 162.5x = 13000$
$\Rightarrow x = \frac{13000}{162.5} = 80$
Total number of notes = $\frac{15\times80}{8} = 150$

Sol.269.(c) 9 + 1 = 10
Number of medals is in the whole number and 75 is not divisible by 10, so 9:1 can not be the ratio of gold and silver medal.

Sol.270.(a)
Let the income of A and B = 3x and 2x
And the expenditure of A and B = 5y and 3y
A/Q ,
3x - 5y = 2000 __(1)
2x - 3y = 2000 __(2)
From equation (1) and (2)
3x - 5y = 2x - 3y $\Rightarrow x = 2y$
From equation (1)

⇒ 6y - 5y = 2000 ⇒ y = 2000
⇒ x = 4000
Difference of their income = x = 4000

Sol.271.(b)
Let both the numbers are = 3x and 2x
A/Q ,
$\Rightarrow \frac{3x-8}{2x-6} = \frac{8}{5}$
$\Rightarrow 15x - 40 = 16x - 48 \Rightarrow x = 8$
Numbers are 24 and 16

Sol.272.(a) Initial amount in bank accounts of both friends are 47000 and 54000 respectively
Bonus = 2000
New ratio of their amount
= 47000 + 2000 : 54000 + 2000
= 49000 : 56000
= 49 : 56 = 7 : 8

Sol.273.(a) Given , A : B = X : 12 , B : C = 4 : Y and A : C = 5 : 3
A : B : C
X : 12
4 : Y

(4X) : 48 : (12Y)
Hence ,
$\Rightarrow \frac{A}{C} = \frac{4X}{12Y} = \frac{5}{3}$,
$\Rightarrow \frac{X}{Y} = \frac{5}{1}$

Sol.274.(c) The ratio between man and women = 4 : 3
4 unit = 84
3 unit = 63

Sol.275.(a) Given proportion
$= \frac{1}{3} : \frac{3}{5} : \frac{3}{4}$
= 20 : 36 : 45
Total = 20 + 36 + 45 = 101
A/Q ,
101 unit = Rs 1313
1 unit = 13
2nd part = 36 unit = $36 \times 13 = Rs\ 468$

Sol.276.(c)
Let the number of coins of 50 paisa = 9x
25 paise coins = 5x
10 paisa coins = 6x
A/Q ,
$\frac{9x \times 50 + 5x \times 25 + 6x \times 10}{100} = 317.5$
$\Rightarrow 450x + 125x + 60x = 31750$
$\Rightarrow 635x = 31750 \Rightarrow x = \frac{31750}{635} = 50$
Number of 25 paise coins
$= 5 \times 50 = 250$

Sol.277.(d) Given , total amount = 1540 Rs
A : (B + C) = 2 : 9 or 28 : 126
B : (A + C) = 3 : 11 or 33 : 121
Ratio between A , B and C = 28 : 33 : 93
Share of C = $\frac{93}{154} \times 1540 =$ 930 Rs.

Sol.278.(a) Firstly we convert the simple form of a given fraction .
A : B : C = $\frac{1}{2} : \frac{2}{3} : \frac{3}{4}$
LCM of the denominator = 12
Then 12 multiply with each fraction ,
Hence . A : B : C = 6 : 8 : 9
23 unit = 391 Rs
6 unit = $\frac{6 \times 391}{23}$ = 102 Rs.

Sol.279.(c) 1.75 : x : : 5:8
$\Rightarrow \frac{1.75}{x} = \frac{5}{8} \Rightarrow 5x = 8 \times 1.75$
$\Rightarrow x = \frac{8 \times 1.75}{5} = \frac{14}{5} = 2.8$

Sol.280.(b) Let the third proportion = x
$\Rightarrow \frac{4}{9} = \frac{9}{x} \Rightarrow 4x = 81$
$\Rightarrow x = \frac{81}{4} = 20\frac{1}{4}$

Sol.281.(d)
Given ratios are 1 : 2, 3 : 10, and 10 : 21
Compound ratio = $\frac{1 \times 3 \times 10}{2 \times 10 \times 21} = \frac{1}{14}$
$= 1 : 14$

Sol.282.(d) Ratio of the income of two person = 7x : 5x
$\Rightarrow \frac{7x - 1700}{5x - 1100} = \frac{9}{7}$
⇒ x = 500
Hence, income of first person = 7x
= 7 × 500 = 3500
Income of 2nd person = 5x
= 5 × 500 = 2500

Sol.283.(c)
Given , a : b = c : d = e : f = g : h = 1 : 3
Then ,
(pa + qc + re + sg) : (pb + qd + rf + sh)
(p × 1 + q ×1 + r × 1 + s ×1) :
(p × 3 + q× 3 + r × 3 + s × 3)
(p + q + r + s) : 3 (p + q + r + s) ⇒ 1 : 3

Sol.284.(c)
given a : b = 2 : 5, b : c = 5 : 8, c : d = 8 : 11
Then a : b : c : d = 2 : 5 : 8 : 11
then a : d = 2 : 11

Sol.285.(d)
Let the four numbers are a , b , c , d ;
Among four numbers, the second is thrice of the first, the third is four times the second , the fourth is five times the third ;
i.e. b = 3a , c = 4b, d = 5c , and
The mean of the four numbers is 1900
$\Rightarrow \frac{a+b+c+d}{4} = \frac{a+3a+12a+60a}{4}$
$19a = 1900 \Rightarrow a = 100;$
Then the smallest number is : a = 100 ;

Sol.286.(d) Initially John have Rs 19,000 and Joseph have Rs 26,000
If Joseph gives Rs. 1,000 to John,
Ratio of the amount with john and Joseph = 20000 : 25000
= 4 : 5

Sol.287.(c)
Let the 1st and 2nd numbers be x and y.
A/Q ,
$\Rightarrow \frac{65x}{100} = 130\ and\ \frac{40y}{100} = 100$
$\Rightarrow x = 200\ and\ y = 250$
Ratio = 200 : 250 = 4 : 5

Sol.288.(c) Let the money of Arun and Ahana = 9x and 5x
A/Q ,
$\Rightarrow \frac{9x-12}{5x+12} = \frac{4}{3} \Rightarrow 27x - 36 = 20x + 48$
$\Rightarrow 7x = 84 \Rightarrow x = 12$
Amount of Arun initially
$= 9x = 9 \times 12 = Rs\ 108$

Sol.289.(d) Let first number = x
And 2nd number = y
A/Q ,
$\Rightarrow \frac{3x}{5} - 10 = \frac{y}{2} \Rightarrow \frac{3x}{5} - \frac{y}{2} = 10$
$\Rightarrow 6x - 5y = 100$ -----(1)
And ,
$\Rightarrow \frac{3x}{7} - 8 + 4 = \frac{y}{2} \Rightarrow \frac{3x}{7} - \frac{y}{2} = 4$
$\Rightarrow 6x - 7y = 56$ ----------(2)
On solving both equation (1) and (2) , we get
$y = 22\ and\ x = 35$
x + y = 35 + 22 = 57

Sol.290.(a) Let , numbers are 5x and 3x
Difference between them = 2x = 50
So , x = 25
Numbers = 125 and 75
Hence product of the numbers
= 125 × 75 = 9375

Sol.291.(a) Filled part = $\frac{3}{5}$
Empty part = 1 - $\frac{3}{5} = \frac{2}{5}$
Required ratio = 3 : 2

Sol.292.(c) Let total chair = x
$\Rightarrow \frac{5x}{14}$ = 30 ⇒ x = 84
People sitting = $\frac{9}{14} \times 84$ = 54
Let total people = y
$\Rightarrow \frac{6y}{11}$ = 54 ⇒ Y = 99
People standing = $\frac{5}{11} \times 99$ = 45

Sol.293.(a) Total Profit earned by Radha in 1 year = $\frac{31500}{3} = 10500$ Rs.
Extra profit earned by Radha in 1 year
= $637.5 \times 12 = 7650\ Rs.$
Profit earned by Radha in 1 year
= 10500 - 7650 = 2850
Now, profit share ratio of Radha and Vatsal = 6 : 7
Profit earned by Vatsal in 1 year
= $\frac{2850}{6} \times 7$ = 3325 Rs.
Total profit earned by Vatsal in 3 year
= 3325 × 3 = 9975 Rs.

Sol.294.(b) Rs. 21,150 is distributed among A , B , and C.
The share of A is $\frac{4}{5}$ of the share of B , and the share of B is $\frac{3}{4}$ of the share of C.
Then the ratio of share of A : B : C
= 12 : 15 : 20 ;
So, the share of A = $21150 \times \frac{12}{47} = 5400$;
So, the share of B = $21150 \times \frac{15}{47} = 6750$
So,the share of C = $21150 \times \frac{20}{47} = 9000$
Let C give Rs.x to A.
Then⇒ $\frac{5400+x}{9000-x} = \frac{7}{9} \Rightarrow x = 900$
So, the part of her initial share that C transferred to A is = $\frac{900}{9000} = \frac{1}{10}$

Sol.295.(b) As a, b, c and d are in continued proportion
$\Rightarrow \frac{a}{b} = \frac{b}{c} = \frac{c}{d} = k(Let)$
$\Rightarrow a = bk$ .....(a)
$\Rightarrow b = ck$.....(b)
$\Rightarrow c = dk$.....(c)
From equations (a), (b) and (c), we get
a = dk^3
Then ,
$\Rightarrow (ma^3 + nb^3 - rc^3) : (mb^3 + nc^3 - rd^3)$
$= \{mb^3k^3 + nb^3 - r(\frac{b}{k})^3\} :$
$\{mb^3 + n(\frac{b}{k})^3 - r(\frac{b}{k^2})^3\}$
$= k^3 : 1$
= a : d

Sol.296.(b) 15% of x = 25% of y = 50% of z
$\Rightarrow \frac{x}{y} = \frac{5}{3}$ and $\frac{y}{z} = \frac{2}{1}$
$x : y : z = 10 : 6 : 3$

Sol.297.(b) Let the number of coins of 25 paise, 10 paise and 5 paise be x, 2x and 3x
$25x + 20x + 15x = 3000$
$\Rightarrow 60x = 3000 \Rightarrow x = 50$
Hence, the number of 5-paise coin
→ 3x = 150

Sol.298.(d) Length of the cloth = 30 m or 3000 cm
Length of the sold cloth = 225 × 12
= 2700 cm
Remaining cloth = 3000 - 2700 = 300 cm
Fractional value of remaining cloth
→ $\frac{300}{3000} = \frac{1}{10}$

Sol.299.(c)
$\frac{a}{b+c} = \frac{1}{3} \times \frac{3}{3} = \frac{3}{9}$ ..... e.q .(1)
$\frac{c}{a+b} = \frac{5}{7}$ ..... e.q .(2)
from e.q .(1) and e.q .(2) , we get
a = 3 , b = 4 and c = 5
So , b : (c + a) = $4 : (3 + 5)$ = 1 : 2

Sol.300.(b) 420 × $\frac{4}{7}$ - 200 × $\frac{3}{5}$ = x
⇒ 240 - 120 = x ⇒ x = 120

Sol.301.(c) Let three numbers be x,y and z
According to question ,
x : y : z
4 : 9 **) × 3**
3 **) × 3** : 4
---
12 : 27 : 36
Let the numbers be 12x, 27x and 36x
According to question ,
(12x) + (27x) + (36x) = 100
Then , 75 units = 100 ⇒ 27 units = 36

Sol.302.(b) $A \times \frac{3}{7}$ = B × $\frac{2}{3}$ = $C \times \frac{4}{5}$ = k
A = $\frac{7K}{3}$, B = $\frac{3K}{2}$, C = $\frac{5K}{4}$
According to question ,
$\frac{7K}{3} + \frac{3K}{2} + \frac{5K}{4}$ = Rs. 305
$\Rightarrow \frac{28K+18K+15K}{12}$ = Rs. 305
⇒ 61K = 305 × 12 → K = 60
Share of C = $\frac{5K}{4} = \frac{5 \times 60}{4}$ = Rs. **75**

Sol.303.(b)
(x - 5) : (y - 10) : (z - 15) = 5 : 4 : 3
Let x = 5k + 5 , y = 4k + 10 , z = 3k + 15
According to the question,
x + y + z=750
⇒ (5k + 5) + (4k + 10) + (3k + 15)=750
⇒12k + 30 = 750 ⇒ K = 60
Hence,
x = 5 × 60 + 5 = 305
Y = 4 × 60 + 10 = 250
Z = 3 × 60 + 15 = 195

Sol.304.(c)
Actual ratio of P : Q : R = $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$
$(\frac{1}{2} : \frac{1}{3} : \frac{1}{4}) \times 12 \Rightarrow 6 : 4 : 3$
$\Rightarrow \frac{117}{13}$ = 9 then, P = 54 , Q= 36 , R = 27
Wrong ratio = 2 : 3 :4 then $\Rightarrow \frac{117}{9}$ = 13
Wrong price P = 26, Q = 39 , R = 52
We see that R gain 25

Sol.305.(c)

	Initial	:	final
Population of first year →	10	:	11
Population of second year →	5	:	6
Population of third year →	4	:	3

Final year → 100 : 99
Ratio of population after 3 year and before = 99 : 100

Sol.306.(b) The salary of P of last year and present year is 3x and 5x and salary of Q of last year and present year is 2y and 3y
So, $\frac{3x}{2y} = \frac{4}{5} \Rightarrow \frac{x}{y} = \frac{8}{15}$
According to question ,
Total salary of P and Q at present
$= (5x + 3y)$ = 6800 Rs.
85 unit = 6800 Rs.
1 unit = 80 Rs.
Therefore salary of Q
= $3y \times 80 = 80 \times 3 \times 15$ = 3600 Rs.

Sol.307.(b) Let total books
→ (L.C.M. of 5 and 4) = 20 units
1st day sale → $\frac{2}{5} \times 20$ = 8 units
Remaining books after 1st day sale
= 12 units
2nd day sale = $\frac{3}{4} \times 12$ = 9 units
Now , Remaining books after 2nd day sale = 3 units
3 units = 75 , ⇒ 1 unit = 25 books
so total books (20 units)
= 20 × 25 = 500 books

Sol.308.(b) Let the ratio of income of Vinod
and Manoj be 6x and 7x.
Now, $\frac{6x+16000}{7x+16000} = \frac{8}{9}$
$54x + 144000 = 56x + 128000$
$56x - 54x = 144000 - 128000$
$2x = 16000 \Rightarrow x = 8000$
So, Manoj's income = Rs. 56,000

Sol.309(c) Dimension of A4 sheet → 297 × 210 mm
Dimension of A3 sheet → 420 × 297 mm
Required Ratio ⇒ 210 : 420 = 1 : 2

Sol.310.(c) initial expenditure

→ $12600 \times \frac{5}{7}$ = 9000 Rs.

increased income → $12600 \times \frac{4}{3}$

= 16800 Rs.

final expenditure → $9000 \times \frac{6}{5}$

= 10800 Rs.

final savings → $\frac{16800-10800}{16800} = \frac{60}{168}$

= $\frac{5}{14}$

Sol.311.(b) The given amount is divided in the ratio = 6 : 5
According to question ,
6 units = 48 Rs.
Then , 11 units = 88 Rs.

Sol.312.(c)
As , we know that
Total cost = No. of quantity × Price

	Pen	Pencil	Eraser
Quantity ⇒	3x	2x	1x
Price ⇒	3	2	2

Total cost ⇒ 9x + 4x + 2x = 285 Rs.
⇒ 15x = 285 Rs.⇒ 1x = 19 ⇒ 3x = 57

Sol.313.(c)
Ratio of salary of A, B and C ⇒ 6 : 7 : 8
According to question ,
C got 52000 Rs. = 8 units
1 unit = 6500 Rs.
Then , 13 units = 84500 Rs.

Sol.314.(d) As , we know that
Total cost = No. of quantity × Price

	Pen1	Pen2	Pen3
Quantity ⇒	7x	6x	5x
Price ⇒	5	10	15

Total cost ⇒ 35x + 60x + 75x = 340 Rs.
⇒ 170x = 340 Rs. ⇒ 1x = 2 Rs.⇒ 6x = 12

Sol.315.(c)
As , we know that
Total cost = No. of quantity × Price

	Pen	Pencil	Eraser
Quantity ⇒	3x	2x	1x
Price ⇒	3	2	2

Total cost ⇒ 9x + 4x + 2x = 180 Rs.
⇒ 15x = 180 Rs. ⇒ 1x = 12 ⇒ 3x = 36

Sol.316.(b)
As , we know that
Total cost = No. of quantity × Price

	Pen	Pencil	Eraser
Quantity ⇒	3x	2x	1x
Price ⇒	3	2	2

Total cost ⇒ 9x + 4x + 2x = 135 Rs.
⇒ 15x = 135 Rs. ⇒ 1x = 9 ⇒ 3x = 27

Sol.317.(a)
As , we know that
Total cost = No. of quantity × Price

	Pen1	Pen2	Pen3
Quantity ⇒	5x	6x	4x
Price ⇒	5	10	15

Total cost ⇒ 25x + 60x + 60x = 290 Rs
⇒ 145x = 290 Rs.
⇒ 1x = 2 Rs. ⇒ 6x = 12

Sol.318.(d)
Ratio of salary of A, B and C ⇒ 3 : 5 : 7
According to question ,
C got 49000 Rs. = 7 units
1 unit = 7000 Rs.
Then , 8 units = 56000 Rs.

Sol.319. (a) Ratio of no. of Old coins are 12 units ,13 units and 11 units whose value are 3Rs. , 4Rs. and 5Rs. Respectively
Total price = (12 × 3 + 13 × 4 +11 × 5)unit
= 572
⇒ 143 units = 572 ⇒1 unit = 4
No. of 3 Rs. coins = 12 units ⇒ 48

Sol.320. (d)
Ratio of salary of sam , sai and shree
⇒ 7 : 9 : 11
According to question ,
Shree got 320 Rs. more than sam = 4 units
4 units = 320 Rs.
Then , 9 units = 720 Rs.

Sol.321.(c) According to question ,
Ratio of gift got by boys are:-
Boy 1 : Boy 2 : Boy 3 : Boy 4
2 : 1
3 : 1
4 : 1
Now, equating ratio
Boy 1 : Boy 2 : Boy 3 : Boy 4
12 : 6 : 4 : 3
Now, 25 unit = 450 ⇒ 1 unit = 18
then, 3 unit = 54

Sol.322.(d) Ratio of no. Old coins are 12 units , 11 units and 13 units whose value are 3Rs. , 4Rs. And 5Rs. Respectively
Total price = (12 × 3 + 11 × 4 +13 × 5)unit
= 580 ⇒ 145 units = 580
⇒1 unit = 4
No. of 3 Rs. coins = 12 units ⇒ 48

Sol.323.(b) According to question ,
Ratio of gifts received by boys :-
Boy 1 : Boy 2 : Boy 3 : Boy 4
2 : 1
3 : 1
4 : 1
Now, combined ratio
Boy 1 : Boy 2 : Boy 3 : Boy 4
12 : 6 : 4 : 3
Now, 25 unit = 400 ⇒ 1 unit = 16
then, 18 unit = 288

Sol.324.(d)
Number of coins→ 7 : 5 : 3
Value of coin → ₹3 ₹4 ₹5
Total value = (7 × 3 + 5 × 4 + 3 × 5) unit
= 392 ⇒ 56 units = 392
⇒ 1 unit = 7
Number of ₹3 coins = 7 units ⇒ 49

Sol.325.(c) Ratio of salaries of wasim, wilson and william ⇒ 7 : 11 : 9
According to question ,
Difference between salaries of William and Wasim = ₹ 120
2 units = ₹ 120
Then , Wilson's salary = 11 units = ₹ 660

Sol.326.(d) Ratio of no. Old coins are 3 units , 5 units and 7 units whose value are 1Rs. , 5Rs. And 10Rs. Respectively
Total price = (3 × 1 + 5 × 5 +7 × 10)unit
= 686 Rs. ⇒ 98 units = 686
⇒1 unit = 7
No. of 10 Rs. coins = 7 units ⇒ 49

Sol.327. (c) Ratio of no. of coins →
1Rs. : 5Rs. : 10Rs.
6 : 7 : 8
Total price = (6 × 1 + 7 × 5 + 8 × 10)unit
= 847 ⇒ 121 units = 847
⇒ 1 unit = 7
No. of 10 Rs. coins = 8 units ⇒ 56

Sol.328.(b) According to question ,
Ratio of gift got by Children are:-
Child 1 : Child 2 : Child 3 : Child 4
2 : 1
3 : 1
4 : 1
Now, equating ratio
Child 1 : Child 2 : Child 3 : Child 4
12 : 6 : 4 : 3
Now, 25 unit = 550 ⇒ 1 unit = 22
then, 18 unit = 396

Sol.329.(c) According to question ,
Ratio of gifts received by Children is:-
Children1 : Children 2 : Children 3 : Children 4
2 : 1
3 : 1
4 : 1
Now, the combined ratio:
Boy 1 : Boy 2 : Boy 3 : Boy 4
12 : 6 : 4 : 3
Now, 25 unit = 725 ⇒ 1 unit = 29
then, 18 unit = 522

Sol.330.(d)
Number of coins→ 3 : 5 : 7
Value of coin → ₹1 ₹5 ₹10
Total value = (3 × 1 + 5 × 5 + 7 × 10) units
= 1372 ⇒ 98 units = 1372

⇒1 unit = 14
Number of ₹10 coins = 7 units ⇒ 98

Sol.331.(a) Ratio of salaries of Hameed, Salman and Ganesh ⇒ 3 : 5 : 7
According to question ,
Ganesh got Rs. 852 more than Hameed.
$(7-3)$ units = 4 units = 852
1 unit = 213
Then , 5 units = Rs. 1065

Sol.332.(a) According to question ,
Ratio of gift got by Children are:-
Child 1 : Child 2 : Child 3 : Child 4
2 : 1
3 : 1
4 : 1
Now, equating ratio
Child 1 : Child 2 : Child 3 : Child 4
12 : 6 : 4 : 3
Now, 25 unit = 775 ⇒ 1 unit = 31
then, 18 unit = 558

Sol.333.(c) Ratio of no. Old coins are 3 units, 5 units and 7 units whose value are 1Rs., 5Rs. and 10Rs. respectively
Total price = (3 × 1 + 5 × 5 + 7 × 10) unit
= 294 ⇒ 98 units = 294
⇒ 1 unit = 3
No. of 10 Rs. coins = 7 units ⇒ 21

Sol.334.(b)
Let the number of mango trees and neem plants be 8 x and 11 x respectively.
As per the question,
8x + 11x = 361 ⇒19x = 361 ⇒ x = 19
Hence, total number of neem plants
= 11 × 19 = 209

Sol.335.(a)
Ratio of sand and cement in the mixture
$= \frac{17\times 6}{8\times 17} = \frac{3}{4}$

Sol.336.(a)
Balancing the given ratio, we have:

Copper	:	Zinc	:	nickel
17	:	7	:	**7**
3	:	3	:	4
51	:	21	:	28

So, the required ratio = 51 : 21 : 28

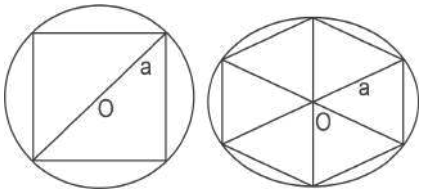
Sol.337.(c)
Let the heights of Nani and Leelu be 4x and 3x respectively
ATQ ,
⇒ 3x = 1.2 ⇒ x = 0.4
So, the height of Nani = 4x = 4 × 0.4
= 1.6m

Sol.338.(d) Let the no of chairs be x
ATQ,
⇒ 12 × 50 + 40 × x = 5,000
⇒ 600 + 40x = 5,000
⇒ 40x = 5000 - 600 = 4400
⇒ $x = \frac{4400}{40} = 110$
Required ratio = 110 : 12 = 55 : 6

Sol.339.(a) Balancing the given ratio we have :
Red : Green = 5 : 12) × 3 = 15 : 36
Red : Pink = 15 : 7
So, the ratio of Red, Green and Pink token = 15 : 36 : 7
Required ratio = 36 : 7

Sol.340.(c) Let the quantity of sugar and flour be 2x and 7x
ATQ,
2x + 7x = 9 ⇒ 9x = 9 ⇒ x = 1
So, the quantity of sugar and flour = 2 kg and 7 kg
Again, let the required quantity of sugar which should be added be M
ATQ, $\frac{2+M}{7} = \frac{2}{5}$ ⇒ 10 + 5M = 14
⇒ 5M = 14 - 10
⇒ 5M = 4 ⇒ $M = \frac{4}{5}$ = 0.8 kg = 800 g

Sol.341.(c) As per the directions given in the question, we have following figure :



Area of square inscribed in circle = x^2
$= \frac{(2a)^2}{2} = 2a^2$
Area of hexagon inscribed in a circle
= 6 × area of equilateral triangle
$= 6 \times \frac{\sqrt{3}}{4}a^2 = \frac{3\sqrt{3}}{2}a^2$
Required ratio = $2a^2 : \frac{3\sqrt{3}}{2}a^2 = 4 : 3\sqrt{3}$

Sol.342.(d) Balancing the given ratio,

A	:	B	:	C
3	:	8	:	8
6	:	6	:	13
18	:	48	:	104 or 9 : 24 : 52

Sol.343.(b)
Balancing the given ratio, we have :

Red	:	Green
4	:	9
$1_{\times 4}$	:	$3_{\times 4}$ = 4 : 12

Here, 3 unit i.e.(12 - 9) → 6
Then, 4 unit → $\frac{6}{3}$ × 4 = 8,
Number of red balls = 8

Sol.344.(d)
Let the no of ₹1, 5 and ₹10 be x each
ATQ,
x + 5x + 10x = 368 ⇒ 16x = 368
⇒ $x = \frac{368}{16} = 23$
So, the total no of coins in the bag = 3x
= 23 × 3 = 69

Sol.345.(a) Given,

	1 rupee	:	50 paisa	:	25 paisa
Number of coins →	**3**	:	**4**	:	**5**
Value in rupee →	3	:	2	:	1.25

And , (3 + 2 + 1.25) unit = 93.75
Now 1 unit = 15 Therefore,
number of 1 rupee coin = 15 × 3 = 45 coins
Number of 50 paisa coins = 15 × 2 = 30 rupees i.e 60 coins
Number of 25 paisa coins = 15 × 1.25
= 18.75 rupees i.e 75 coins

Sol.346.(c) It is given that :
Ratio of the no of marbles that Joyee and Minati had = 5 : 8
Ratio of the no of marbles that Minati and Jacob had = 12 : 7
So, the ratio of number of marbles that Joyee and Jacob = 5 × 12 : 8 × 7 = 60 : 56
= 15 : 14

Sol.347.(a) Balancing the given ratio, we have ;
Pulak : Menaja = 5 : 9) × 2 = 10 : 18
Jairam : Menaja = 7 : 18
Now, the ratio of the number of marbles that Pulak and Jairam had = 10 : 7

Sol.348.(d) The actual duration of the television show was = $\frac{14}{3} - \frac{1}{5} \times \frac{14}{3}$
⇒ $\frac{14}{3} - \frac{14}{15} \Rightarrow \frac{70-14}{15} \Rightarrow \frac{56}{15} = 3\frac{11}{15}$ hrs

Sol.349.(b) Number of boys in the class
$= \frac{3}{5} \times 45 = 27$

Sol.350.(a)
Let the total cost of the car = Rs. x
M pays = $Rs.\ \frac{3x}{7}$ and N pays = Rs.$\frac{4x}{7}$
ATQ,
$\frac{4x}{7} - \frac{3x}{7} = 31540 \Rightarrow \frac{x}{7} = 31540$
$\Rightarrow x = 220780$
Hence, the cost of the car = Rs. 2,20,780

Partnership

When two or more persons join hands for a business to attain profits is called **Partnership** and the persons are called **partners**.

Types of Partners :-

1. Active Partners: The partner who manages the business is known as Active Partner or working partner.

2. Sleeping Partner: A partner, who simply invests his money in the business but does not manage it voluntarily is referred as Sleeping partner.

Every partner invests some amount of money for a certain time to help the partnership firm to get profits.

Types of partnership :-

1. Simple partnership – If all partners invest their different amounts of capital (money) for the same period or the same capital for a different period, then such a partnership is called a simple partnership.

2. Compound partnership – If all the partners invest their different capitals (money) for different periods, then such a partnership is called a compound partnership.

In Compound partnership partners' profit not only depends on their investments but also on the time period.

Case 1. When capital investment is the same for the different time periods :-

$P_1 : P_2 : P_3 = T_1 : T_2 : T_3$

Ex.1 - Aftab, Tarun and Aditya started a business by investing Rs. 8000 each . but after six months Aftab left and after 8 months Tarun left . If at the end of the year, there was a gain of Rs. 7800, then what will be the share of Tarun ?

Sol . Ratio of Profit

→ Aftab: Tarun : Aditya = 6 : 8 : 12

Share of Tarun → $\frac{8}{26}$ × 7800 = 2400 Rs.

Case 2. When capital investment X_1 , X_2 and X_3 is different for the different time period T_1 , T_2 and T_3.

$P_1 : P_2 : P_3 = X_1T_1 : X_2T_2 : X_3T_3$

Ex.2 - Aman and Bhanu invest some amount in the ratio 4 : 5 in a business. After 8 months, Chandan joins them with an investment equal to thrice that of Bhanu . In what ratio should the yearly profit be shared among Aman , Bhanu and Chandan ?

Sol .

Ratio of profit is equal to the product of investment and time of investment .

Ratio → Aman : Bhanu : Chandan

Investment → 4 : 5 : 15

Time → 12 : 12 : 4

Profit → 48 : 60 : 60 = 4 : 5 : 5

Ex.3 - Rajesh and Sanjay are partners in a business firm. Rajesh puts in Rs. 5000 and Sanjay puts in Rs. 4000. Rajesh receives 10 % of the profit for managing the business as he is the active partner and the rest of the profit is divided in the ratio of their capitals. If the total profit is Rs. 1000, find Rajesh's total share.

Sol .

Here the investment time is the same , then the profit will be shared in the ratio of their investment .

Rajesh get 10% of total profit as he is active partner → $1000 \times \frac{10}{100}$ = 100 Rs.

Remaining Profit = 900 Rs.

Ratio of Profit → 5000 : 4000 = 5 : 4

Raj total share → 100 + 500 = 600 Rs.

Variety Questions

Q.1. A . B and C started a business. They partnered for 6 months, 12 months and 14 months respectively. If their profit is in the ratio 5 : 4 : 7 respectively, then the ratio of their respective investments is :

Group D 17/08/2022 (Afternoon)

(a) 5 : 2 : 3 (b) 2 : 3 : 5

(c) 2 : 3 : 7 (d) 1 : 5 : 3

Q.2. A and B invest ₹42,000 and ₹56,000 respectively, in a business. At the end of the year they make a profit of ₹87,220. Find B's share in the profit.

Group D 18/08/2022 (Afternoon)

(a) ₹47,240 (b) ₹49,840

(c) ₹48,480 (d) ₹45,620

Q.3. Ravi started a business by investing Rs.50,000. After six months Raju joined him and invested an amount of Rs.1,00,000. In one year since Ravi invested, they earned a profit of Rs.63,000. What is Raju's share of the profit ?

Group D 22/08/2022 (Morning)

(a) ₹32,500 (b) ₹31,000

(c) ₹32,000 (d) ₹31,500

Q.4. P and Q enter into a partnership with investments of Rs.1400 and Rs.1800 respectively. They share half of the profit equally for running the business and the remaining profit in the ratio of their investments. If the difference in their shares of profits is Rs.47, what is the total profit?

RRB JE 22/05/2019 (Evening)

(a) Rs.752 (b) Rs.954

(c) Rs.804 (d) Rs.504

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.5. Mr. Sharma, Mr. Gupta and Ms Sinha invested ₹ 4,000 , ₹8,000 and ₹6,000, respectively, in a business. Mr. Sharma left after 6 months. If after 8 months, there was a gain of ₹34,000, then what will be the share of Mr. Gupta ?

Group D 22/08/2022 (Evening)

(a) ₹12,000 (b) ₹20,000

(c) ₹14,000 (d) ₹16,000

Q.6. P , Q and R jointly start a business. It was agreed that P would invest ₹25,000 for 6 months, Q ₹44,000 for 5 months and R ₹50,000 for 3 months. Out of total profit of ₹1,04,000, the amount received by P will be :

Group D 23/08/2022 (Afternoon)

(a) ₹30,000 (b) ₹27,900

(c) ₹40,920 (d) ₹33,000

Q.7. A started a business with a capital of ₹4,50,000. After 3 months, B joined him with a certain amount of capital. At the end of a year of A's starting the business, the profit was shared in the ratio 3 : 2. How much (in ₹) did B invest ?

Group D 08/09/2022 (Evening)

(a) 3,20,000 (b) 4,20,000

(c) 3,60,000 (d) 4,00,000

Q.8. 'A' and 'B' invest ₹30,000 and ₹24,000, respectively, for one year. If they get a profit of ₹13,500, then the share of 'B' in the profit is :

Group D 12/09/2022 (Evening)

(a) ₹6,000 (b) ₹9,450

(c) ₹9,000 (d) ₹7,500

Q.9. A , B and C invested ₹10,000, ₹12,000 , and ₹15,000 , respectively , for 5 , 6 , and 9 months, respectively, in a business. If A's share in the profit is ₹2,500, then the total profit is :

Group D 14/09/2022 (Evening)

(a) ₹12,550 (b) ₹12,650

(c) ₹12,700 (d) ₹12,850

Q.10. Anil and Sunil started a business investing equal amounts. Anil left after 9

months. They earned an annual profit of ₹28,000. What is Sunil's share of annual profit ?
Group D 22/09/2022 (Morning)
(a) ₹16,000 (b) ₹15,000
(c) ₹13,000 (d) ₹12,000

Q.11. Ren and Martin started a company on 1 March 2019. The ratio of their investments was 5 : 4. Martin left the company after 15 months. In what ratio must the profit be divided at the end of 2 years ?
Group D 22/09/2022 (Morning)
(a) 2 : 1 (b) 29 : 19 (c) 24 : 15 (d) 1 : 3

Q.12. Giri and Kamal invested their capitals in a business in the ratio 5 : 7, respectively. If ₹1,728 was the total money invested in the business, what is Giri's share in the business ?
Group D 27/09/2022 (Afternoon)
(a) ₹702 (b) ₹720 (c) ₹1,008 (d) ₹1,080

Q.13. A starts a business with ₹7,250 and after 3 months, B joins A as his partner. After a year since A started the business, the profit is divided between A and B in the ratio 8 : 9. What is B's contribution in the capital ?
Group D 06/10/2022 (Afternoon)
(a) ₹10,250 (b) ₹10,500
(c) ₹10,000 (d) ₹10,875

Q.14. A and B invest in a business in the ratio of 7 : 8 for same time. If 7% of the total profit goes to charity and A's share in profit is ₹12,600, then what is the total amount of profit earned ? [Give your answer correct to 2 decimal places.]
Group D 11/10/2022 (Afternoon)
(a) ₹28,025.32 (b) ₹28,032.25
(c) ₹29,025.32 (d) ₹29,032.25

Q.15. Mohan, Meena and Madhav enter into a partnership investing ₹3,000, ₹2,000 and ₹5,000 respectively. Find their respective shares in the annual profit of ₹5,600 in the given order of the names mentioned here.
Group D 11/10/2022 (Evening)
(a) ₹1,752, ₹1,168, ₹2,680
(b) ₹1,680, ₹1,120, ₹2,800
(c) ₹1,480, ₹1,320, ₹2,800
(d) ₹1,680, ₹1,240, ₹2,680

RRB JE (22/05/2019 to 28/06/2019)

Q.16. Three men entered into a business in partnership for 14 months, 8 months and 7 months. If the ratio of their profit is 5 : 7 : 8, what is the ratio of their investments?
RRB JE 23/05/2019 (Morning)
(a) 20 : 49 : 64 (b) 5 : 4 : 4
(c) 28 : 49 : 64 (d) 5 : 7 : 8

Q.17. P and Q invested in a business in the ratio 5 : 13. Q withdrew his capital after 6 months. If they shared their profit in the ratio 25 : 26, for how long was P's amount used?
RRB JE 24/05/2019 (Evening)
(a) 15 months (b) 12 months
(c) 18 months (d) 8 months

Q.18. A and B invest some amount in the ratio 3 : 5 in a business. After 6 months, C joins them with an investment equal to that of B. In what ratio should the yearly profit be shared among A, B and C?
RRB JE 25/05/2019 (Afternoon)
(a) 3 : 5 : 6 (b) 6 : 10 : 5
(c) 6 : 7 : 5 (d) 3 : 5 : 4

Q.19. P invests half as much as Q and Q puts in half as much as R in a business. If the monthly profit of Rs.7000 is shared between them, then what is the share of R?
RRB JE 29/05/2019 (Evening)
(a) Rs 2000 (b) Rs 3000
(c) Rs1000 (d) Rs 4000

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.20. Umar and Avinash started a partnership with investments of ₹ 10,000 and ₹ 15,000, respectively but due to a financial emergency the latter had to withdraw his investment after 8 months. In what ratio should the profit of the first twelve months be shared among
RRB ALP 09/08/2018 (Morning)
(a) 2 : 3 (b) 1 : 1 (c) 3 : 2 (d) 1 : 2

Q.21. Surbhi invested ₹6000 for 5 months and Urba invested ₹5000 for 6 months in a venture. The ratio in which they will share the profits is:
RRB ALP 21/08/2018 (Evening)
(a) 6 : 5 (b) 1 : 1 (c) 5 : 6 (d) 36 : 25

Answer key:-

1.(a)	2.(b)	3.(d)	4.(a)
5.(d)	6.(a)	7.(d)	8.(a)
9.(d)	10.(a)	11.(a)	12.(b)
13.(d)	14.(d)	15.(b)	16.(a)
17.(a)	18.(b)	19.(d)	20.(b)
21.(b)			

Solutions:-

Sol.1.(a)

	A	:	B	:	C
Investment →	x	:	y	:	z
Time →	6	:	12	:	14
Profit →	5	:	4	:	7

$6x = 5 \Rightarrow x = \frac{5}{6}$,

$12y = 4 \Rightarrow y = \frac{1}{3}$

$and\ 14z = 7 \Rightarrow z = \frac{1}{2}$

Now, ratio of investment

= x : y : z = $\frac{5}{6} : \frac{1}{3} : \frac{1}{2}$ = 5 : 2 : 3

Sol.2.(b) A's share : B's share
= 42000 × 12 : 56000 × 12 ⇒ 3 :4

B's share = $\frac{4}{7} \times 87220 = ₹49,840$

Sol.3.(d)

	Ravi	:	Raju
Time →	12 months	:	6 months
Investment→	50000	:	100000
Profit →	1	:	1

Total profit = 2 unit = ₹ 63000
Therefore profit of Raju = 1 unit = ₹31500

Sol.4.(a)
The ratio of the investment → P : Q
= 14 : 18 or 7 : 9
Then , the ratio of their profits → 7 : 9
Let the total profit be y .
Difference between their profits at half of the total profit = 47
Now, $\frac{9-7}{16} \times \frac{y}{2}$ = 47
Total profit (y) = 47 × 16 = 752

Sol.5.(d)

	A	:	B	:	C
Investment →	4000	:	8000	:	60000
Time →	6	:	8	:	8
Profit →	24	:	64	:	48
	3	:	8	:	6

Mr. Gupta share = $\frac{8}{17}$× 34,000= ₹ 16,000

Sol.6.(a)

	P	:	Q	:	R
Investment →	25000	:	44000	:	50000
Time →	6	:	5	:	3
Profit →	15	:	22	:	15

P's profit = $\frac{15}{52}$ × 104000 = ₹ 30,000

Sol.7.(d) Let B joined with amount of x
Ratio of profit of A and B
= $\frac{4,50,000 \times 12}{9x} \Rightarrow \frac{3}{2}$
$\Rightarrow 27x = 10800000 \Rightarrow x = 400000$
Hence, B invest = ₹ 4,00,000

Sol.8.(a)

	A	:	B
Investment →	30000	:	24000
Time →	1	:	1
Profit →	5	:	4

So, profit of B = $\frac{13500}{9}$ × 4 = ₹ 6000

Sol.9.(d) A : B : C
Investment→ 10000 : 12000 : 15000
Time → 5 : 6 : 9
Ratio of profit → 50 : 72 : 135
A's profit = 50 units → 2500
Then, total profit = (50 + 72 + 135) units
→ $\frac{2500}{50} \times 257 = ₹12,850$

Sol.10.(a) Anil : Sunil
Investment → 1 : 1
Time → 9 : 12
Profit → 3 : 4
Total profit (4 + 3) = 7 unit
→ 28000 (given)
So share of Sunil = $\frac{28000}{7}$ × 4 = ₹16000

Sol.11.(a) Ren : Martin
Investment → 5 : 4
Time→ 24 : 15
Profit → 120 : 60
Therefore, ratio of profit = 2 : 1

Sol.12.(b) Invested capital ratio Giri and Kamal = 5 : 7
Total money invested = ₹1,728
Giri's share = $\frac{5}{12} \times 1728$ = ₹720

Sol.13.(d) Ratio of profit of A and B = 8 : 9
Let the amount invested by B = b
According to the question,
7250 × 12 : b × 9 = 8 : 9
$\frac{7250 \times 12}{b \times 9} = \frac{8}{9} \Rightarrow$ b = 10,875
Hence, Amount invested by B = 10,875

Sol.14.(d)
Ratio of investment of A and B = 7 : 8
According to question ,
7 unit = 12600
15 unit = 27000
Let the total profit = 100 unit
After 7% charity, remaining profit
= 100 - 7 ⇒ 93 unit
According to question,
93 unit = 27,000
100 unit = 29032.25
So , total profit = 29032.25

Sol.15.(b)
Ratio of investment
= 3000 : 2000 : 5000 or 3 : 2 : 5
Total investment = 5600
According to question ,
3x + 2x + 5x = 5600
10x = 5600 ⇒ x = 560
Share of Mohan = 3x = 3 × 560 = 1680
Share of Meena = 2x = 2 × 560 = 1120
Share of Madhav = 5x = 5 × 560 = 2800

Sol.16.(a) Ratio of profit is equal to the ratio of product of investment and time.
Ratio of investment = x : y : z
Ratio of time = 14 : 8 : 7

Ratio of Profit = 5 : 7 : 8
Now , x : y : z ⇒ 20 : 49 : 64

Sol.17.(a) Let P's time be x
P : Q
Investment 5 : 13
Time x : 6
Profit 25 : 26
5x : 78 = 25 : 26 ⇒ $\frac{5x}{78} = \frac{25}{26}$
X = 15 months

Sol.18.(b) Ratio of profit is equal to the product of investment and time of investment .
Ratio → A : B : C
Investment → 3 : 5 : 5
Time → 12 : 12 : 6

Profit → 36 : 60 : 30
= 6 : 10 : 5

Sol.19.(d) Let , R invested 4 units in a business .
Ratio → P : Q : R
Investment → 1 : 2 : 4
As the investment time is same , then the profit ratio will be the share in the ratio of their investment .
Total Profit (7 units) = 7000 Rs.
Share of R (4 units)
→ $\frac{7000}{7} \times 4$ = 4000 Rs.

Sol.20.(b) Required profit ratio
= 10,000 × 12 : 15,000 × 8 = 30 : 30 = 1 : 1

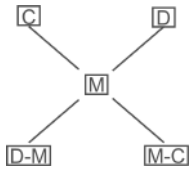
Sol.21.(b) The ratio of the profit of Surbhi and Urba
= 6,000 × 5 : 5,000 × 6 = 30,000 : 30,000
= 1 : 1

Mixture and Alligation

Mixture : when two or more than two substances mixed together in any ratio to produce a product is called mixture .

Mean price : the average of all the given prices of the known items is called Mean Price .

1. Alligation rule : It is used to find the ratio in which two or more substances at their respective prices should be mixed to produce a mixture at a given price.



where
C = Cost price of cheaper
D = Cost price of dearer
M = Mean price
(D - M) = Cheaper quantity
(M - C) = Dearer quantity

2. Quantity of pure liquid = $x(\frac{x-y}{x})^n$

where, x = Quantity of original liquid, y = Quantity to be carried out and replaced, n = Number of times the operation is conducted

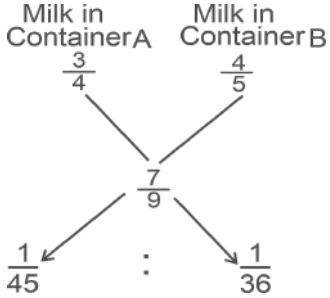
Important Cases :-

Case 1 :
Ratio of milk and water in container A, and B are 3 : 1 and , 4 : 1 respectively. Find the ratio in which containers A and B are mixed to get 7 : 2 in container C ?

Sol : Fraction of milk in container A = $\frac{3}{4}$

Fraction of milk in container B = $\frac{4}{5}$

Fraction of milk in container C = $\frac{7}{9}$



So, the required ratio = 36 : 45 ⇒ 4 : 5

Case 2 :
Ratio of milk and water in container A and B are 3 : 1 and 4 : 1 respectively. Ratio in which container A and B are to be mixed is 2 : 1. Find the ratio of quantity of milk and water in container C.
Soln :

Fraction of milk in container A = $\frac{3}{4}$

Fraction of milk in container B = $\frac{4}{5}$

Ratio in which container A and B are to be mixed is 2 : 1. So, let the quantity in container A and B be 2 litre and 1 litre respectively.
So, the required ratio =

$[\frac{3}{4} \times 2] + [\frac{4}{5} \times 1] : [\frac{1}{4} \times 2] + [\frac{1}{5} \times 1]$

$= \frac{3}{2} + \frac{4}{5} : \frac{1}{2} + \frac{1}{5} = \frac{23}{10} : \frac{7}{10}$ = 23 : 7

Case 3 : Two varieties costing ₹4/kg and ₹5/kg respectively are mixed in 3 : 2. Find the cost price per kg of the resultant mixture?

$A_{wt} = \frac{A1W1 + A2W2}{W1 + W2} = \frac{4 \times 3 + 5 \times 2}{3 + 2}$

A_{wt} = avg weight, $W1$= weight of first variety ,$W2$= weight of second variety, A1 =cost of first variety, A2 =cost of second variety

$= \frac{12 + 10}{5} = \frac{22}{5}$ = 4.4 kg

Variety Questions

Q.1. X and Y are two alloys of Gold and Platinum prepared by mixing the metals in the ratio of 5 : 2 and 5 : 7, respectively. If we melt equal quantities of the alloys to form a third alloy Z, then the ratio of the quantity of Gold to the quantity of Platinum in Z will be:
Group D 17/08/2022 (Morning)
(a) 95 : 84 (b) 73 : 95
(c) 95 : 73 (d) 84 : 73

Q.2. In what ratio should sugar costing ₹45 per kg be mixed with sugar costing ₹52 per kg so that by selling the mixture at ₹55.20 per kg, there is a profit of 15%?
Group D 01/09/2022 (Afternoon)
(a) 4 : 3 (b) 5 : 4 (c) 3 : 2 (d) 2 : 1

Q.3. Two mixtures A and B have the following compositions. Mixture A has copper and tin in the ratio 1 : 2. Mixture B has copper and tin in the ratio 1 : 3. If equal quantities of mixtures A and B are used for producing mixture C, then find the ratio of copper and tin in mixture C.
Group D 28/09/2022 (Afternoon)
(a) 7 : 17 (b) 7 : 12 (c) 2 : 5 (d) 1 : 5

Q.4. In a mixture of 90 litres, the ratio of milk to water is 4 : 1. In another mixture of 90 litres, the ratio of milk to water is 3 : 2. What is the positive difference between the quantities of milk in the two mixtures ?
NTPC CBT II Level 5 (12/06/2022) Shift 1
(a) 23 litres (b) 18 litres
(c) 16 litres (d) 22 litres

Q.5. In a mixture of liquid, $\frac{1}{5}$ part is acid, $\frac{3}{5}$ part is alcohol and the remaining part is water. If the total quantity of the mixture is 20 litres, then how much water (in litres) does the mixture contain?
NTPC CBT - I 29/12/2020 (Evening)
(a) 15 (b) 8 (c) 4 (d) 12

Q.6. If two liters of water is evaporated from a 5 liter solution containing 3% salt, then what is the percentage of salt in the remaining solution?
NTPC CBT - I 04/03/2021 (Morning)
(a) 5% (b) 2% (c) 6% (d) 3%

Q.7. A trader mixes 20kg of one variety of rice at Rs52 per kg with 60kg of another variety at Rs.36 per kg. If he sells that mixed rice at Rs.44 per kg, his profit percent is _____.
NTPC CBT - I 01/04/2021 (Evening)
(a) 10 (b) 5 (c) 6 (d) 8

Q.8. In a test paper, correct answers fetch three marks and there is a penalty of one mark for each wrong answer. A student who attempts 76 questions gets 144 marks. How many questions did the student get right?
NTPC CBT - I 24/07/2021 (Morning)
(a) 53 (b) 60 (c) 58 (d) 55

Q.9. From a container of 50 litres pure milk, 10 litres milk is taken out and replaced by 10 litres of water. If this process is repeated thrice, what is the ratio of water to milk finally?
RRB JE 27/05/2019 (Evening)
(a) 7 : 16 (b) 9 : 16 (c) 61 : 64 (d) 64 : 61

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.10. The ratio of milk to water in 10 liters of a mixture is 3 : 2. If this ratio is to be made 2 : 3, then the quantity of water to be added to the mixture is:
Group D 29/08/2022 (Morning)
(a) 10 liters (b) 8 liters
(c) 5 liters (d) 12 liters

Q.11. Manganese and aluminium are mixed in the ratio of 2 : 3 to make an alloy. The quantity (in kg) of aluminium required to be melted with 24 kg of manganese is_____.
Group D 14/09/2022 (Morning)

(a) 36 (b) 12 (c) 48 (d) 72

Q.12. If a milkman adds 4 liter of water to 9 liter of milk, then the amount of water he should add to 36 liter of milk in order to maintain the same proportion of milk and water will be:
Group D 18/09/2022 (Afternoon)
(a) 16ℓ (b) 12ℓ (c) 10ℓ (d) 14ℓ

Q.13. 6 kg of ₹48 per kg rice is mixed with 3 kg of another variety of rice to get a mixture costing ₹60 per kg. What is the price per kg of another variety rice in the mixture ?
Group D 30/09/2022 (Afternoon)
(a) ₹64 (b) ₹72 (c) ₹84 (d) ₹80

RRB NTPC CBT - 2 (09/05/2022 to 17/06/2022)

Q.14. 2 litres of liquid having milk and water in the ratio 3 : 2 is mixed with 3 liters of liquid having milk and water in the ratio 2 : 3. Find the ratio of milk to water in the new mixture.
Level 5 (12/06/2022) Shift 1
(a) 9 : 4 (b) 5 : 6 (c) 12 : 13 (d) 1 : 1

Q.15. How much water should be added to 90 ml of a 38% sugar solution so that it becomes a 17.1% sugar solution ?
Level 2 (13/06/2022) Shift 1
(a) 110 ml (b) 100 ml (c) 81 ml (d) 95 ml

Q.16. A certain quantity of a 35% sugar solution is mixed with the 8 litres of a 48% sugar solution to obtain a 40% sugar solution. How many litres of the 35% sugar solution was there in the mixture ?
Level 5 (15/06/2022) Shift 1
(a) 12.8 (b) 13.6 (c) 13.2 (d) 12.5

Q.17. In a blend of apple juice and orange juice, 20% was apple juice. In another blend of the two juices, 30% was orange juice. The two blends are mixed in a certain ratio so that the ratio of apple juice and orange juice in the mixture was 4 : 3. Find the ratio of the first blend and the second blend in that order, in the final mixture.
Level 5 (15/06/2022) Shift 3
(a) 10 : 29 (b) 9 : 26 (c) 2 : 7 (d) 5 : 14

Q.18. In a stock of two products A and B initially 80% of the total stock was product A. If 20 kg of product A and 8 kg of product B were taken out from the stock, then the ratio of the product A to product B in the stock changed to 9 : 2. What was the total stock (in kg) in the beginning ?
Level 3 (17/06/2022) Shift 2
(a) 150 kg (b) 165 kg
(c) 220 kg (d) 160 kg

RRB NTPC CBT - 1 (28/12/2020 to 31/07/2021)

Q.19. From 10 litres of a solution 2 litres of water evaporated. The remaining solution was found to have 6% salt. What was the percentage of salt in the original solution ?
RRB NTPC 29/12/2020 (Evening)
(a) 5.4% (b) 5.6% (c) 5% (d) 4.8%

Q.20. A metallic part of a machine is made from a mixture of copper, zinc and lead mixed in the ratio of 13 : 6 : 1. If the weight of zinc in this part is 90 kg, then the total weight of the part will be
RRB NTPC 30/12/2020 (Morning)
(a) 210 kg (b)195 kg (c) 300 kg (d) 285 kg

Q.21. If 140g brass is mixed with copper to prepare an alloy having brass and copper in the ratio 4 : 3, then how much copper has been taken to prepare the alloy ?
RRB NTPC 09/01/2021 (Morning)
(a) 105 g (b) 245 g (c) 60 g (d) 80 g

Q.22. In a bucket, milk and water are mixed in the ratio 2 : 1. If the ratio of milk to water is to be 1 : 2, the quantity of water to be added to the mixture is.
RRB NTPC 13/01/2021 (Morning)
(a) $\frac{1}{3}$ of the bucket (b) $\frac{1}{4}$of the bucket
(c) half of the bucket (d) one full bucket

Q.23. If a vessel gets filled by 15 glasses of milk where capacity of each glass is 1.5 L, how many glasses are required to fill the same vessel if the capacity of each glass is 0.5 L ?
RRB NTPC 31/01/2021 (Evening)
(a) 40 (b) 45 (c) 50 (d) 55

Q.24. A sample of milk from a vessel contains 4% water. What quantity of pure milk should be added to 8 L of milk in the vessel to reduce the water content to 2% ?
RRB NTPC 31/01/2021 (Evening)
(a) 8 L (b) 7 L (c) 7.5 L (d) 6.5 L

Q.25. If 50 L of liquid containing 20% spirit is added with 10L of water then what would be the percentage of spirit in the resulting mixture?
RRB NTPC 02/02/2021 (Evening)
(a) $12\frac{1}{2}$% (b) 20% (c) $16\frac{2}{3}$% (d) $33\frac{1}{3}$%

Q.26. The capacity of two pots is 132 liters and 69 litres, respectively. Find the maximum capacity of a container that can exactly measure the content of the two pots.
RRB NTPC 04/02/2021 (Morning)
(a) 3040 cc (b) 3060 cc
(c) 3000 cc (d) 3080 cc

Q.27. How much of an 80% orange juice drink must be mixed with 36 liters of a 25% orange juice drink to obtain a mixture that has 60% orange juice ?
RRB NTPC 09/02/2021 (Morning)
(a) 72 liters (b) 40 liters
(c) 63 liters (d) 60 liters

Q.28. To make Idlis, if you take two parts rice and one part urad dal, what percentage of such a mixture would be rice and what percentage would be urad dal respectively ?
RRB NTPC 10/02/2021 (Morning)
(a) 100 % , 99% (b) $66\frac{2}{3}$%, $33\frac{2}{3}$%
(c) 66%, 33% (d) $66\frac{2}{3}$%, $33\frac{1}{3}$%

Q.29. A and B are two alloys formed by the combination of gold and copper in the ratio 5 : 3 and 5 :11 respectively. Equal quantities of these two alloys are melted and mixed to form a new alloy C. Now, alloy C contains gold to copper in the ratio:
RRB NTPC 22/02/2021 (Evening)
(a) 33 : 25 (b) 15 : 17
(c) 17 : 15 (d) 25 : 23

Q.30. A mixture contains alcohol and water in the ratio of 5 : 4. If 9 litres of water is added to the mixture, the ratio of alcohol to water becomes 4 : 5. Find the quantity of alcohol in the mixture.
RRB NTPC 09/03/2021 (Evening)
(a) 20 litres (b) 16 litres
(c) 24 litres (d) 28 litres

Q.31. A and B are two alloys of gold and copper prepared by mixing the metals in the ratio of 7 : 2 and 7 : 11, respectively. equal quantities of the alloys are melted to form a third alloy, C. if the amount of copper in C is 10 kg, then what is the amount of gold in C ?
RRB NTPC 14/03/2021 (Evening)
(a) 10 kg (b) 8 kg (c) 12 kg (d) 14 kg

Q.32. 3 liters of pure petrol is added to 13 liters of a mixture of petrol and ethanol containing 40% petrol. Find the percentage of ethanol in the resulting mixture.
RRB NTPC 19/03/2021 (Morning)
(a) 48.75% (b) 48.25%
(c) 49.25% (d) 48.50%

Q.33. A milk vendor sells milk at 20%

more than the cost price. Also, he adds 3 litres of water to every 5 litres of milk. Find his overall gain percent.
RRB NTPC 03/04/2021 (Morning)
(a) 25% (b) 92% (c) 80% (d) 60%

Q.34. What quantity of water should be added to reduce 9 L of 50% acidic liquid to 30% acidic liquid ?
RRB NTPC 03/04/2021 (Evening)
(a) 3 L (b) 5 L (c) 9 L (d) 6 L

Q.35. In a mixture of milk and water of 120 litres, the ratio of milk to water is 2 : 1. If the ratio of milk to water needs to be 1 : 2 , then the amount of water that needs to be added to the mixture is:
RRB NTPC 07/04/2021 (Morning)
(a) 110 litres (b) 120 litres
(c) 140 litres (d) 130 litres

Q.36. In mixture A, there is 5 L of syrup in 6 L of water, In mixture B, there is 3.5 L of syrup in 5.5 L of water . In which of the two mixtures is the concentration of syrup greater ?
RRB NTPC 07/04/2021 (Evening)
(a) more information is required to be able to determine where the concentration of syrup is more.
(b) the concentration of of syrup is same in both A and B
(c) B
(d) A

Q.37. The ratio of sand and cement in a mixture was initially 9 : 2. After adding 20 kg of sand and 10 kg of cement to the mixture, the ratio of sand and cement became 4 : 1. What was the initial quantity of cement in the mixture?
RRB NTPC 23/07/2021 (Evening)
(a) 30 kg (b) 20 kg (c) 40 kg (d) 50 kg

Q.38. A dairy man purchases at Rs. 6.40 per litre of milk. He adds water and sells the mixture at Rs. 8 per litre, thereby making 37.5% profit. The ratio of water to milk received by his customer is:
RRB NTPC 31/07/2021 (Evening)
(a) 1 : 10 (b) 2 : 11 (c) 1 : 9 (d) 1 : 11

Q.39. 85L of a mixture contains milk and water in the ratio 27 : 7. How much more water should be added to get a new mixture containing milk and water in the ratio 3 : 1 ?
RRB NTPC 31/07/2021 (Evening)
(a) 8 L (b) 5 L (c) 15 L (d) 13 L

RRB JE
(22/05/2019 to 28/06/2019)

Q.40. Pure ghee costing Rs.100 per Kilogram and vegetable oil costing Rs. 50 per kilogram are mixed in some ratio and sold at Rs.96 per kilogram so as to gain 20% . In what ratio is ghee and oil mixed ?
RRB JE 25/05/2019 (Evening)
(a) 2 : 3 (b) 4 : 3 (c) 3 : 2 (d) 3 : 4

Q.41. Two types of rice costing Rs.38 per kg and Rs.42 per kg are mixed in equal quantities and sold at Rs.45 per kg. Find the gain per cent.
RRB JE 28/05/2019 (Afternoon)
(a) 18% (b) 12.5% (c) 10% (d) 15%

RRB ALP Tier - 2
(21/01/2019 to 08/02/2019)

Q.42. A mixture of 100 liters contains milk and water in the ratio 3 : 2. If this ratio is to be 1 : 2, then how much more water is to be added ?
ALP Tier II 08/02/2019 (Morning)
(a)120 litres (b) 80 litres
(c) 60 litres (d) 100 litres

RPF S.I.
(19/12/2018 to 16/01/2019)

Q.43. In the mixture of 84 liters, the ratio of milk and water is 3 : 4. If this ratio is changed to 3 : 5, then tell the amount of excess water (in liters) mixed in the mixture.
RPF S.I. 05/01/2019 (Morning)
(a) 11 (b) 13 (c) 14 (d) 12

Q.44. The quantity of milk and water in a 49liters mixture is in the ratio 3:4. How much water (in litres) should be added to the mixture so that the ratio of milk and water becomes 3 : 5 ?
RPF S.I. 06/01/2019 (Afternoon)
(a) 7 (b) 6 (c) 5 (d) 4

Q.45. In the mixture of 56 liters, the ratio of milk and water is 3: 4. If this ratio is changed to 3: 5, then tell the amount of excess water (in liters) mixed in the mixture.
RPF S.I. 10/01/2019 (Morning)
(a) 9 (b) 6 (c) 7 (d) 8

RRB ALP Tier - 1
(09/08/2018 to 31/08/2018)

Q.46. $\frac{2}{3}$ of a milk-water mixture was milk. There was 21 litres of the mixture. If 4 litres of water is added to it, the percentage of milk in the new mixture will be:
RRB ALP 09/08/2018 (Afternoon)
(a) 44 (b) 11 (c) 56 (d) 14

Q.47. 15% of an alloy was silver. If in a quantity of alloy there was 51 g of silver, what was the quantity of the other elements in the alloy ?
RRB ALP 17/08/2018 (Afternoon)
(a) 289 g (b) 204 g (c) 300 g (d) 340 g

Q.48. Two water-squash mixtures, the first with a water-to-squash ratio of 5 : 1 and the latter with a ratio of 3 : 1 are blended in the ratio 3 : 2. What is the final water : squash ratio in the blend ?
RRB ALP 17/08/2018 (Evening)
(a) 5 : 3 (b) 10 : 9 (c) 4 : 1 (d) 6 : 1

Q.49. Two water-squash mixtures, the first having a water-to-squash ratio of 4 : 1 and the other having a ratio of 3 : 1, are blended in the ratio 1 : 2. What is the water: squash ratio in the blend ?
RRB ALP 20/08/2018 (Evening)
(a) 4 : 3 (b) 19 : 11
(c) 17 : 13 (d) 23 : 7

Q.50. 35% of an alloy was silver. If in the quantity of alloy there was 119g of silver, what was the quantity of the other elements in the alloy ?
RRB ALP 31/08/2018 (Morning)
(a) 221 g (b) 204 g (c) 340 g (d) 273 g

Answer key:-

1.(c)	2.(a)	3.(a)	4.(b)
5.(c)	6.(a)	7.(a)	8.(d)
9.(c)	10.(c)	11.(a)	12.(a)
13.(c)	14.(c)	15.(a)	16.(a)
17.(b)	18.(d)	19.(d)	20.(c)
21.(a)	22.(d)	23.(b)	24.(a)
25.(c)	26.(c)	27.(c)	28.(d)
29.(b)	30.(a)	31.(d)	32.(a)
33.(b)	34.(d)	35.(b)	36.(d)
37.(c)	38.(a)	39.(b)	40.(c)
41.(b)	42.(b)	43.(d)	44.(a)
45.(d)	46.(c)	47.(a)	48.(c)
49.(d)	50.(a)		

Solutions:-

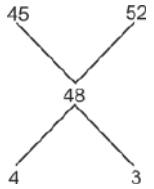
Sol.1.(c)
Gold : Platinum = Total
5 : 2 = 7 **) × 12** = 84 units
5 : 7 = 12 **) × 7** = 84 units

Required ratio →
(5 × 12) + (5 × 7) : (2 × 12) + (7 × 7) = 95 : 73

Sol.2.(a)

C.P. after mixing → $55.20 \times \frac{100}{115}$ = ₹48/kg

By alligation method - ,



Required ratio = 4 : 3

Sol.3.(a)

Ratio → Copper : Tin

Mixture A → 1 : 2)× 4 → 4 : 8

Mixture B → 1 : 3)× 3 → 3 : 9

For equal quantities of mixture,

So, the ratio of copper and tin in the mixture C ⇒ (4+3) : (8+9) = 7 : 17

Sol.4.(b) Ratio of milk to water = 4 : 1

5 units = 90 ⇒ 4 units = 72 liter

In another mixture,

Ratio of milk to water = 3 : 2

5 units = 90 liter ⇒ 3 units = 54 liter

So, positive difference between the quantities of milk = 72 - 54 = 18 liter

Sol.5.(c) The ratio of alcohol, acid and water in the mixture = 3 : 1 : 1

Now the total quantity of the mixture is ⇒ (3 + 1 + 1) = 5 units → 20 litres,

Then the amount of water (in litres) that the mixture contain = $20 \times \frac{1}{5}$ = 4 litres.

Sol.6.(a)

Initial solution = 5 liter = 5000ml

Salt= 3 % of 5000= 150 ml

If 2 liter = 2000 ml of water is evaporated

Amount of new solution = 3000 ml

% of salt in the new solution →

$\frac{150}{3000} \times 100 = 5\%$

Sol.7.(a) CP of rice =

$20 \times 52 + 60 \times 36 = 3200$ ₹

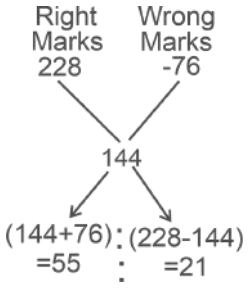
SP of rice = $80 \times 44 = 3520$ ₹

Required profit % →

$\frac{3520 - 3200}{3200} \times 100 = 10\%$

Sol.8.(d)

Using alligation method -



Right ques. = 55 and Wrong ques. = 21

Sol.9.(c)

$\frac{Left\ quantity\ of\ pure\ milk}{total\ quantity}$ =

$\left(1 - \frac{replaced\ quantity}{total\ quantity}\right)^n$

$\frac{Left\ milk}{total\ quantity} = \left(1 - \frac{10}{50}\right)^3 = \frac{64}{125}$

Required ratio → (125 - 64) : 6 = 61 : 64

Sol.10.(c)

Milk : water = 3 : 2)× 2 → 6 : 4

Milk : water = 2 : 3)× 3 → 6 : 9

So, 5 litres of water should be added.

Sol.11.(a) Ratio of manganese and aluminium = 2 : 3

Quantity of aluminium required

$\rightarrow \frac{3}{2} \times 24 = 36\ kg$

Sol.12.(a)

Ratio of milk and the mixture = 9 : 13

Let x liter of water be added.

$\frac{36}{36 + x} = \frac{9}{13}$

$\Rightarrow 324 + 9x = 468 \Rightarrow 9x = 468 - 324$

$\Rightarrow 9x = 144 \Rightarrow x = 16$

Hence, 16 liters of water should be added.

Sol.13.(c)

Total quantity of rice = 6 + 3 = 9 kg

According to the question,

6 × 48 + 3 × n = 9 × 60

288 + 3n = 540 ⇒ 3n = 252 ⇒ n = 84

So, price per kg of another variety of rice = ₹ 84

Sol.14.(c)

Milk : water = 3 : 2 **)× 2 → 6 : 4**

Milk : water = 2 : 3 **)× 3 → 6 : 9**

So, Final ratio of Milk and water in new mixture = (6 + 6) : (4 + 9) = 12 : 13

Sol.15.(a)

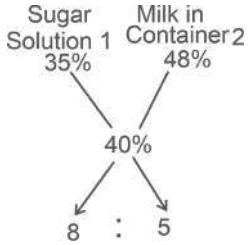
Quantity of sugar = $90 \times \frac{38}{100}$ = 34.2

For 17.1% sugar solution,

As per question,

17.1% of (x + 90) = 34.2 ⇒ x = 110 ml

Sol.16.(a) Using alligation method ,



As per question,

5 unit = 8 liter ⇒ 8 unit = 12.8 liter

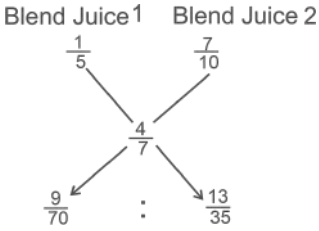
Sol.17.(b)

Ratio → Apple : Orange

Mixture 1 → 1 : 4

Mixture 2 → 7 : 3

Now, using alligation method on apple Juice.



Now, Required ratio = $\frac{9}{70} : \frac{13}{35} = 9 : 26$

Sol.18.(d) Let the total stock be x

Now, $\frac{4x - 20}{x - 8} = \frac{9}{2} \Rightarrow x = 32$

Total stock = 32 × 5 = 160 kg

Sol.19.(d) Let there is x kg of salt in the initial solution of 10 litres

From this solution 2 litres of water evaporated, so the new amount of the solution = (10 - 2) = 8

The remaining solution was found to have 6% salt = $\frac{x}{8} \times 100 = 6$

$\Rightarrow 100x = 48 \Rightarrow x = \frac{48}{100} = 0.48$

So, the percentage of salt in the original solution = $\frac{0.48}{10} \times 100 = 4.8\%$

Sol.20.(c) A metallic part of a machine is made from a mixture of copper, zinc and lead mixed in a ratio of 13 : 6 : 1

According to the question,

weight of zinc in this metallic part = 6 units → 90 kg

So, the total weight of the metallic part = (13 + 6 + 1) = 20 units

$\Rightarrow \frac{90}{6} \times 20$ kg = 300 kg.

Sol.21.(a) 140 g brass is mixed with copper to prepare an alloy having brass and copper in the ratio 4 : 3

Here 4 units equivalent to 140,

So 3 units will be equivalent to

$= \frac{140}{4} \times 3 = 105$

Then , 105g copper has been taken to prepare the alloy.

Sol.22.(d)

Water is added to the bucket but there is no change in milk so the quantity of milk remains the same .

Ratio → Milk : water ⇒ total

Initial → 2 : 1 ⇒ 3 units

Final → 1 : 2 **)×2** ⇒ 6 units

Water to be added = {(2×2) – 1} units

= 3 units which is equals to one full

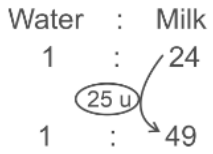
bucket of water.

Sol.23.(b) The total quantity of milk in the vessel = $1.5 \times 15\ litres$
New Capacity of glass = $0.5\ litres$
Number of Glass required to fill same quantity of milk in the vessel
$= \frac{1.5 \times 15\ litres}{0.5\ litres} = 45$

Sol.24.(a) Water = 4% and Milk = 96%
Ratio of milk and water = 24 : 1
After adding milk the % of water = 2% and milk = 98%
Ratio of milk and water = 49 : 1
Initial quantity = 25 unit = 8 L
Final quantity = 50 unit = 16 L
Milk added = 16 - 8 = 8L
Short Tricks:-

Fractional value of 4% = $\frac{1}{25}$ and

2% = $\frac{1}{50}$

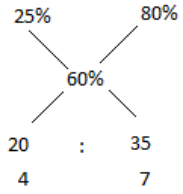


According to questions:-
Initial milk sample = 25 units = 8 ltrs
pure milk should be added in the vessel to reduce the water content to 2%
= 25 units = 8 ltrs

Sol.25.(c) Total mixture = 50 L ,
spirit = 20% of 50 L = 10 L
water = 80% of 50 L = 40 L
A/Q , 10 L Water is added in mixture then total mixture = 60 L
Now 60 L = 100 %
10 L = $\frac{100}{60} \times 10 = 16\frac{2}{3}\%$

Sol.26.(c) HCF of 132 and 69 liters = 3
Now , 3 liter = 3000 cubic centimeter

Sol.27.(c)



ATQ,
4 units → 36 liters ⇒7 units→ 63 liters

Sol.28.(d) Total mixture = 3 unit

Rice = $\frac{2}{3}$ and urad dal = $\frac{1}{3}$

Rice % in total mixture = $\frac{2}{3} \times 100 = 66\frac{2}{3}\%$

Urad dal % in total mixture
$= \frac{1}{3} \times 100 = 33\frac{1}{3}\%$

Sol.29.(b)
Equal quantity of alloy A and alloy B is to be mixed so we have to make both quantities equal.
Ratio → Gold : Copper
Alloy A → 5 : 3) × 2
Alloy B → 5 : 11

Total ⇒ {(5×2)+5} : {(3×2)+11} = 15 : 17

Sol.30.(a) Alcohol is the same in both conditions.
Ratio → Alcohol : Water
Initial → 5 : 4)×4
Final → 4 : 5)×5

Extra water added in the mixture → {(5×5)−(4×4)} = 9 units = 9 litre
Alcohol in the mixture (20 units) = 20 litre

Sol.31.(d)
Ratio → Gold : Copper
Alloy A → 7 : 2)×2
Alloy B → 7 : 11

Total (Alloy C) = {(7×2)+7} : {(2×2)+11}
→ 21 : 15 = 7 : 5
According to the Questions ,
Copper (5 units) = 10 kg , then
Gold (7 units) = 14 kg

Sol.32.(a)
Ratio → Petrol : Ethanol
Initial → 2 : 3
According to the question ,
Total (5 units) = 13 litre
Petrol (2 units) = 2.6 litre
Ethanol (3 units) = 3.9 litre
Now , After mixing 3 lit. of petrol in mixture ,
Final Total mixture = 100% = 13 lit.
Petrol in the mixture = 40 %
$= \frac{13 \times 40}{100}$ = 5.2 lit.
Ethanol in the mixture
= 60% = 13 - 5.2 = 7.8
After mixing 3 lit. of petrol in mixture , then total mixture = 16 lit.
Petrol in the mixture = 8.2
Ethanol in the mixture = 16 - 8.2 = 7.8
The percentage of ethanol in the resulting mixture = $\frac{7.8}{16} \times 100$ = 48.75 %

Sol.33.(b)
Let the CP of the milk per litre = 100
CP of 5 litre milk = 500
When we add 3 litre of water in to it total quantity = 8 litre
CP of 8 litre = 500 ⇒ P = 20%
SP of 1 litre = 100 + 20 = 120
SP of 8 litre = $8 \times 120 = 960$
P = 960 - 500 = 460
P % = $\frac{460}{500} \times 100 = 92\%$

Sol.34.(d)
Acidic liquids in both condition is same ,
Ratio → Acid : Water
Case 1 → 1 : 1)×3
or 3 : 3 = 6 units
Case 2 → 3 : 7
According to the question ,
6 units = 9 litre
Extra water added (7−3) = 4 units
4 units = $\frac{9}{6}$ × 4 = 6 litre

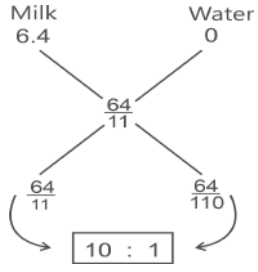
Sol.35.(b)
Milk is the same in both conditions.
Ratio → Milk : Water
Initial → 2 : 1
Final → 1 : 2)×2

Initial total mixture (3 units) = 120 litre
Extra water added in the mixture → {(2×2)−(1)} = 3 units = 120 litre

Sol.36.(d)
In mixture A ratio of syrup to water = 5 : 6
In mixture of B ratio of syrup to water = 7 : 11
Concentration of syrup in mixture A
$= \frac{5}{11} \times 100 = 45.45\%$
Concentration of syrup in mixture B
$= \frac{7}{18} \times 100 = 38.88\%$

Sol.37.(c)
Let the sand = 9x and cement = 2x
$\frac{9x + 20}{2x + 10} = \frac{4}{1}$
$\Rightarrow 9x + 20 = 8x + 40 \Rightarrow x = 20$
Initial quantity of cement
$= 2 \times 20 = 40\ kg$

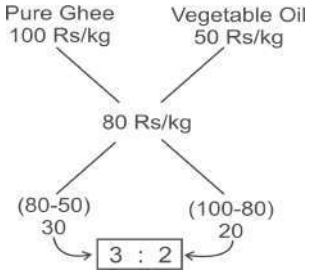
Sol.38.(a)



The Cost price of pure milk was Rs.6.4 but it is sold with some added water at Rs.8 with 37.5% profit.
However, the Cost price for the mixture of 'Milk + Water' = 8 x $\frac{8}{11}$
and we are performing the allegation method on the Cost price.
Therefore, the final ratio of Water to Milk will be 1 : 10.

Sol.39.(b) Ratio of milk and water = 27 : 7
After adding water
M : W = 3 : 1
We added water but the quantity of milk remains same
M : W = 9 (3 : 1) = 27 : 9
Increased water = 9 - 7 = 2
A/Q ,
27 + 7 = 34 unit = 85 litre
2 unit = $\frac{85}{34} \times 2 = 5L$

Sol.40.(c) Fractional value → 20% = $\frac{1}{5}$
C.P. = $\frac{96}{6} \times 5$ = 80 Rs.



Required ratio → 3 : 2

Sol.41.(b) Let the variety of rice be mixed in 1 : 1 ratio .
Then C.P. for 2kg of mixture
= 38 + 42 = 80 Rs.
S.P. for 2kg of mixture = 45 × 2 = 90 Rs.
Required Profit %
= $\frac{90-80}{80} \times 100$ = 12.5%

Sol.42.(b)
Ratio → Milk : Water
Initial → 3 : 2
Final → 1 : 2)×3

Initial quantity (5 units) = 100 L
Required water quantity(6 - 2) units → $\frac{100}{5} \times 4$ = 80 L

Sol.43.(d)
Ratio of milk : Ratio of water
Old ⇒ 3 : 4 → 7 units = 84 litres
New ⇒ 3 : 5 → 8 units
Here , we can see that there is increase in water of 1 unit
⇒ 7 unit = 84 litres
⇒ 1 unit = 12 litres

Sol.44.(a) milk : water
Old ⇒ 3 : 4 ⇒ 7 units = 49 litres
New ⇒ 3 : 5
Here , we can see that there is an increase of 1 unit in water.
⇒ 7 units = 49 litres
⇒ 1 unit = 7 litres

Sol.45.(d)
Ratio of milk : Ratio of water
Old ⇒ 3 : 4 ⇒ 7 unit = 56 litres
New ⇒ 3 : 5
Here , we can see that there is increase in water of 1 unit
⇒ 7 unit = 56 litres ⇒ 1 unit = 8 litres

Sol.46.(c) Quantity of milk in the mixture
= 21 × $\frac{2}{3}$ = 14 litres
Quantity of water in the mixture
= 21 - 14 = 7 litres
Quantity of water in the new mixture
= 7 + 4 = 11 litres
Required percentage of milk
= $\frac{14}{14+11} \times 100 = \frac{14}{25} \times 100$ = 56 litres

Sol.47.(a)
Let the quantity of an alloy be 20 units
The quantity of silver = 20 × 15% = 3 units which corresponds to 51g
Then, 1 unit = $\frac{51}{3}$ = 17 g
The quantity of other element in the alloy
= 20 - 3 = 17 units = 17 × 17 = 289 g

Sol.48.(c)
Balancing the given ratio, we have :
Water : Squash
1st mixture → 5 : 1 = 6) ×2×3
2nd mixture → 3 : 1 = 4)× 3×2

Final mixture → 8 : 2 or 4 : 1

Sol.49.(d)
Balancing the given ratio, we have;
Water : Squash
Ist mixture → 4 : 1) ×4×1 = 16 : 4
2nd mixture → 3 : 1) ×5×2 = 30 : 10
---
46 : 14 or 23 : 7

Sol.50.(a) Ratio of silver and other elements in the alloy = 35 : 65 or 7 : 13
7 unit → $119g$
Then, 13 unit → $221\ g$
So, the quantity of the other element in the alloy = 221g

Time and Work

Introduction

Time :- Time is the duration during which any activity or work happens or continues.
Work :- Work is a task or set of activities to achieve a certain result.
Efficiency :- Efficiency is inversely proportional to the Time taken when the amount of work done is constant.

$$\text{Efficiency} \propto \frac{1}{time\ taken}$$

The efficiency of work means, "How much work one person can do in one day (expressed in percentage)". For example, a person can do a job in 2 days. In other words, we can say that he can do 50% of the work in one day. Therefore, his efficiency will be 50%.

We can define happening of work as:
(1.) If a person A completes a work in X days, then the amount of work completed by him in 1 day will be = $\frac{1}{X}$
(2.) if a person B completes work in Y days, then the amount of work completed by him in 1 day will be = $\frac{1}{Y}$
(3.) From the above two points, we can say that in one day A and B together can complete ($\frac{1}{X} + \frac{1}{Y}$) amount of work. Thus, together A and B can complete the work in ($\frac{XY}{X+Y}$) days.
Here, we have assumed total work as 1 unit. Similarly, we can assume our total work as anything as per our convenience. The best assumption for easing out our calculations of the total work is assuming work as 100% or LCM of time taken by all the persons.

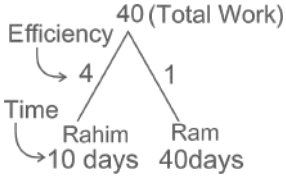
The complete work can also be considered as 1 unit. Then if A takes 4 days to finish a work, it means he can finish 1/4th of the work in 1 day.
Illustrations:

Example :- Rahim can finish the work in 10 days and Ram can finish the same work in 40 days. If Ram and Rahim both work together then what is the total number of days taken ?
Solution:-
The problem can be solved in three different approaches.

Approach 1: Using Fractions
Ram can finish the work in 10 days i.e. in one day he will do $\frac{1}{10th}$ of the work.
Rahim can finish the work in 40 days i.e. in one day he will do $\frac{1}{40th}$ of the work.
So, in one day, both working together can finish = ($\frac{1}{10}$) + ($\frac{1}{40}$) = $\frac{5}{40}$ = $\frac{1}{8th}$ of the work. So, to complete the work they will take 8 days.

Approach2: Using Percentage (Shortcut-Recommended)
Rahim can finish 100 % of work in 10 days i.e. in one day he finishes 10% of the work.
Ram can finish 100% of the work in 40 days i.e. in one day he finishes 2.5 % of the work.
So, working together, in a single day they can finish 12.5% of the work. So, to complete 100% of the work, it will take 100/12.5 = 8 days.

Approach 3: using unitary method



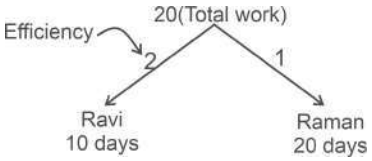
LCM of days (10 , 40) = 40 = (Total work)
Efficiency of (Ram + Rahim) = 4 + 1=5
Ram and Rahim both work together then total number of days taken = 40/5 = 8 days.

Example :- Ravi can do a job in 10 days. Raman can do the same job in 20 days. They together start doing the job but after 4 days Raman leaves. How many more days will be required by Ravi to complete the remaining job alone ?

Solution:-
The problem can be solved in two different approaches.

Approach 1 :- Ravi can finish a job in 10 days i.e in one day he can finish 10 % of the job.
Raman can finish the same job in 20 days i.e. in one day he can finish 5 % of the job.
So, working together, in a day they can do 10 + 5 = 15 % of the job.
In the 4 days, if they worked together, they would have finished 4 × 15% = 60% of the job.
So, Work left = 100 – 60 = 40%. This work has to be done by Ravi who does 10 % of the job in a day. So, to finish the remaining 40%, he will take 40/ 10 = 4 more days.

Approach 2 :-



LCM of days (10 , 20) = 20 = Total work
Efficiency of Ravi = 2
Efficiency of Raman = 1
Work done by Ravi and Raman in 4 days = 3 × 4 = 12 units
Remaining work = 20 - 12 = 8 units
No of days required by Ravi to complete this work = $\frac{8}{2}$ = 4 days

Concept 1
• If A takes 'a' days more to complete a work than the time taken by (A + B) to do same work and B takes 'b' days more than the time taken by (A + B) to do the same work. Then (A + B) do the work in $\sqrt{ab}$ days
We will take some examples to understand this concepts

Example : A and B alone complete a piece of work in 12 days and 3 days more respectively than time taken by A and B together, then Find in how many days A alone can complete the work ?
Sol:- (A+B) complete the work in $\sqrt{12 \times 3}$ = $\sqrt{36}$ = 6 days
So, time taken by A alone to complete the whole work in (6 + 12) = 18 days

Example : A can complete a work in 5 more days than B while A does the same work in 9 more days than C. If (A + B) can complete the whole work in the same time in which C alone does the whole work . In how many days could A alone complete the same work ?
Sol:- Let the time taken by C to complete the work in x days
Then, time taken by A = (x + 9)days
Time taken by B = (x + 9) - 5 = (x + 4)days.
Time taken by C, which is equal to that of (A + B) = $\sqrt{9 \times 4}$ = $\sqrt{36}$ = 6 days
So, time taken by A alone to complete the work = 6 + 9 = 15 days

MDH Formula

MDH formula is used to compare the works of the same nature done at two different times using different manpower. The MDH formula can be represented as

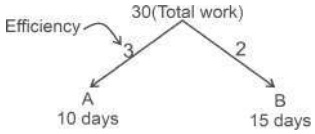
$$\frac{M_1 D_1 H_1 E_1}{W_1} = \frac{M_2 D_2 H_2 E_2}{W_2}$$

Where , M = denotes the number of men/women, D = denotes the number of days, H = denotes the number of hours in a day, E = denotes the efficiency of 1 man, and W = denotes part of work done

Alternate Days

Example :- A can complete a work in 10 days while B can complete the same work in 15 days. In how many days will the work be completed if they work alternatively? (Given : A starts the work)

Sol-



Work done in 2 days = 3 + 2 = 5 units,
5 units work in = 2 days
5 × 6 units work in = 2 × 6 = 12 days.

Example :- To do a certain work , A and B work on alternate days, with B beginning the work on the first day. A can finish the work alone in 27 days. If the work gets completed in $9\frac{1}{2}$ days, then B alone can finish 5 times the same work with half efficiency in :

Sol- As B starts the work, he will work for 5 days and A will work for $4\frac{1}{2}$ days,

Part of work done by A in $4\frac{1}{2}$ days

$= \frac{9}{2 \times 27} = \frac{1}{6}$

So, Part of work done by B in 5 days

$= 1 - \frac{1}{6} = \frac{5}{6}$

Time taken by B to complete the work

$= 5 \times \frac{6}{5} = 6$ days.

Time taken by B to finish 5 times the work with half efficiency = 6 × 5 × 2 = 60 days.

(As efficiency becomes $\frac{1}{2}$, number of days will be multiplied by 2 because efficiency and time are inversely proportional).

Variety Questions

Q.1. P and Q alone can complete a piece of work in 9 days and 12 days, respectively. In how many days will the work be completed if they work on alternate days starting with Q?
Group D 17/08/2022 (Morning)
(a) $10\frac{1}{3}$ (b) $11\frac{5}{6}$ (c) $11\frac{1}{3}$ (d) $10\frac{5}{6}$

Q.2. 5 men and 6 women can do a piece of work in 6 days while 3 men and 5 women can do the same work in 9 days. In how many days can 3 men and 2 women do the same work?
Group D 17/08/2022 (Afternoon)
(a) $11\frac{5}{11}$ days (b) $13\frac{3}{11}$ days
(c) $10\frac{9}{11}$ days (d) $12\frac{1}{11}$ days

Q.3. A can count 100 eggs in 4 minutes while B can count the same number of eggs in 5 minutes. How much time will be required if they work together to count 450 eggs?
Group D 18/08/2022 (Morning)
(a) 5 min (b) 15 min (c) 20 min (d) 10 min

Q.4. A can complete a certain job in 32 days. B is 60% more efficient than A. In how many days can B alone complete the same job?
Group D 24/08/2022 (Morning)
(a) 10 days (b) 32 days
(c) 15 days (d) 20 days

Q.5. P, Q and R can do a piece of work in 9 days, 18 days and 12 days, respectively. They start the work, with P working on Day 1, Q working on Day 2 and R working on Day 3, and then continuing with this cycle till the work is completed. How many days will be needed to complete this work in this manner?
Group D 29/08/2022 (Morning)
(a) 11 days (b) 15 days
(c) 16 days (d) 12 days

Q.6. A book needs to be typed. When working alone A types it in 15 days, B types it in 12 days, C types it in 20 days, and D types it in 8 days. If A and D work together as team SUN, B and C work as team MOON, and A and C work as team RED. Which team finishes typing the book in the least time?
Group D 30/08/2022 (Afternoon)
(a) Team MOON
(b) Team SUN
(c) Team RED
(d) All teams need equal time

Q.7. C is twice as efficient as A, while B takes thrice as many days as C to do the same work. A takes 10 days to do the work alone. If they work in pairs [like (A, B). (B, C) and (C, A)], with (A, B) working on the first day, then (B, C) working on the second day and (C, A) working on the third day and continuing the cycle till the work gets completed, then how many days will be required to complete this work?
Group D 02/09/2022 (Afternoon)
(a) $7\frac{5}{8}$ days (b) $5\frac{7}{8}$ days
(c) $5\frac{7}{8}$ days (d) $4\frac{3}{8}$ days

Q.8. A can complete $\frac{2}{3}$ of a certain work in 12 days and B can complete $\frac{1}{4}$ of the same work in 3 days. Working together, the number of days they will take to finish the work is:
Group D 12/09/2022 (Morning)
(a) $5\frac{1}{5}$ (b) $8\frac{1}{5}$ (c) $7\frac{1}{5}$ (d) $6\frac{1}{5}$

Q.9. Prakash and Vinesh can complete a certain piece of work in 12 and 14 days, respectively. They started to work together, and after 3 days, Vinesh left. In how many days will Prakash complete the remaining work?
Group D 29/09/2022 (Afternoon)
(a) $\frac{45}{7}$ (b) 44 (c) $\frac{43}{8}$ (d) $\frac{44}{7}$

Q.10. 10 men can dig a well 50 feet deep in 8 days. How many men can dig a well 100 feet deep in 10 days?
Group D 30/09/2022 (Evening)
(a) 16 (b) 18 (c) 14 (d) 15

Q.11. Ruchira was supposed to complete a task in 22 days. However, during the first 10 days she did only $\frac{1}{30}$ of the work on each day. What share of the work will Ruchira have to do daily from the 11^{th} day so that the work is completed on time?
NTPC CBT II Level 4 (10/05/2022) Shift 1
(a) $\frac{2}{39}$ (b) $\frac{3}{44}$ (c) $\frac{1}{18}$ (d) $\frac{1}{19}$

Q.12. 12 skilled, 14 semi-killed and 10 unskilled workers complete a job for Rs 13189. If their individual, wages be in the ratio of 9 : 5 : 4, then the total money (in Rs) earned by 10 unskilled workers is:
NTPC CBT II Level 2 (16/06/2022) Shift 3
(a) 3240 (b) 3420 (c) 2420 (d) 2240

Q.13. 20 men and 15 boys can do a piece of work in 10 days. 25 men and 10 boys can do it in 9 days. Find the ratio of the daily work done by a man to that of a boy.
NTPC CBT - I 04/01/2021 (Evening)
(a) 14 : 5 (b) 5 : 12 (c) 12 : 5 (d) 5 : 14

Q.14. While going from Mumbai to Pune by car, I realized that one of the tyres has two punctures. On the basis of my previous experience, I believed that the

first puncture alone would have made the tyre flat in 9 minutes and the second would have done it in 6 minutes. If air leaks out at a constant rate, how long will it take both the punctures together to make the tyre flat ?
NTPC CBT - I 05/01/2021 (Evening)
(a) $3\frac{4}{5}$ mins (b) $3\frac{2}{5}\ mins$
(c) $3\frac{1}{5}\ mins$ (d) $3\frac{3}{5}\ mins$

Q.15. A book has 250 pages. Person A reads 6 pages in an hour. Person B reads 8 pages in an hour. There are two chapters of 72 pages that are difficult for person B to read in the book, so person B takes double the time to read those pages. Who among them will finish the book first and how much sooner than the other ?
NTPC CBT - I 16/01/2021 (Morning)
(a) Person A, 1 hr 35 min
(b) Person B, 1 hr 25 min
(c) Person A, 1 hr 25 min
(d) Person B, 1 hr 35 min

Q.16. A group of men decided to complete a work in 10 days, but five of them remained absent. If the rest of the group completed the work in 12 days, find the original number of men.
NTPC CBT - I 25/01/2021 (Morning)
(a) 25 men (b) 30 men
(c) 40 men (d) 24 men

Q.17. In a computer game, a builder can build a wall in 20 hours while a destroyer can demolish such a wall completely in 50 hours. Both the builder and the destroyer were initially set to work together on level ground. But after 30 hours the destroyer was taken out. What was the total time taken to build the wall?
NTPC CBT - I 31/01/2021 (Morning)
(a) 32 hours
(b) 32 hours 40 mins
(c) 33 hours 20 mins
(d) 32 hours 20 mins

Q.18. Four persons A, B, C, and D completed a task in $\frac{2}{3}hr$, $\frac{3}{4}$hr , $\frac{4}{5}hr$, and $\frac{1}{5}hr$, respectively. Who among the following took the highest amount of time to complete the task ?
NTPC CBT - I 02/02/2021 (Morning)
(a) B (b) D (c) C (d) A

Q.19. A can type 50 words in 1 min and B can type 40 words in 1 min. First A typed for 1 min then B typed for 1 min and so on . In this way, typing alternately, they typed 980 words. The time taken by them in typing these 980 words was :
NTPC CBT - I 15/02/2021 (Morning)
(a) 20 min 35 s (b) 20 min 15 s
(c) 21 min 80 s (d) 21 min 45 s

Q.20. A can do $\frac{1}{5}th$ of some work in 12 days. B can do 20% of the same work in 10 days, C can do $\frac{1}{6}th$ of the work in 8 days and D can do $\frac{1}{5}th$ of the work in 12 days. Who will complete the work first if all four started to work at the same time?
NTPC CBT - I 23/02/2021 (Morning)
(a) D (b) B (c) A (d) C

Q.21. Ram eats 7 bananas in the morning, 8 in the afternoon and 3 in the evening. How many dozen bananas does he eat in a day ?
NTPC CBT - I 04/03/2021 (Evening)
(a) $\frac{2}{15}$ (b) $\frac{3}{2}$ (c) $\frac{2}{3}$ (d) $\frac{8}{15}$

Q.22. Type 1 workers can do three times the work of Type 2 workers. Twelve Type 1 workers can complete a task in 10 days. How many days would it have taken four Type 1 and eight Type 2 workers to complete the same task?
RRB ALP Tier - I 09/08/2018 (Morning)
(a) 17 (b) 20 (c) 18 (d) 16

Q.23. Praneet started his journey at 2 : 45 : 46 p.m. and reached the destination at 4 : 55 : 57 p.m. Anit started the journey 58 mins 40 secs after Praneet and reached his destination 50 mins 29 secs after him. How long did Anit take to complete his journey?
RRB ALP Tier - I 13/08/2018 (Evening)
(a)1 hours 59 minutes
(b) 2 hours 2 minutes
(c) 2 hours 1 minute 12 seconds
(d) 2 hours 2 seconds

Q.24. A and B together can do a piece of work in 10 days. If A can do the work in 15 days, find in how many days that B alone can do the same work. Given below are the steps involved in solving the above problem. Arrange them in sequential order.
A) One day's work of B is $\frac{1}{10}$ - $\frac{1}{15}$
B) One day's work of A and B is $\frac{1}{10}$ on and one day's work of A is $\frac{1}{15}$
C) B alone can do the work in 30 days
D) One day's work of B is $\frac{1}{30}$
RRB ALP Tier - I 30/08/2018 (Morning)
(a) BCAD (b) ABDC (c) BDAC (d) BADC

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.25. 20 women can complete a work in 15 days. 16 men can complete the same work in 15 days. Find the ratio between the work efficiency of a man to a woman.
Group D 17/08/2022 (Morning)
(a) 5 : 3 (b) 3 : 2 (c) 4 : 3 (d) 5 : 4

Q.26. A can finish painting a sari in 11 days, B in 20 days and C in 55 days, if they work independently. In how many days can the work be completed if A is assisted by B on every odd numbered day and by C on every even numbered day till the work completes?
Group D 17/08/2022 (Evening)
(a) 8 days (b) 18 days
(c) 12 days (d) 9 days

Q.27. X and Y can complete a piece of work in 8 days and 12 days, respectively. If they work on alternate days, with X working on the first day, how long will it take the duo to complete the same work?
Group D 17/08/2022 (Evening)
(a) $9\frac{1}{2}$ (b) $9\frac{3}{5}$ (c) $9\frac{2}{3}$ (d) $9\frac{2}{5}$

Q.28. 51 men can complete a work in 12 days. Four days after they started working, 6 more men joined them. How many days will they now take to complete the remaining work?
Group D 22/08/2022 (Afternoon)
(a) $8\frac{1}{19}$ days (b) $5\frac{9}{19}$ days
(c) $7\frac{3}{19}$ days (d) $6\frac{7}{19}$ days

Q.29. A and B together complete work in 8 days. If B is 25% more efficient than A, then in how many days will A alone complete the same work?
Group D 22/08/2022 (Evening)
(a) 24 days (b) 12 days
(c) 18 days (d) 6 days

Q.30. A and B undertake to complete a piece of work for Rs.600. A alone can complete it in 4 days while B alone can complete it in 6 days. With the help of C, they finish the work in 2 days. Find the share of C in the payment received.
Group D 23/08/2022 (Afternoon)
(a) ₹100 (b) ₹200 (c) ₹300 (d) ₹78

Q.31. Madhu and Shiny together can complete a piece of work in 20 days.

Shiney and Rosie Together can complete the same work in 12 days, and Rosie and Madhu together can complete the same work in 15 days. In how many days will all three of them together complete the same work?
Group D 23/08/2022 (evening)
(a) 15 days (b) 10 days
(c) 12 days (d) 5 days

Q.32. 8 men and 12 women can build a wall in 10 days. 6 men and 8 women can build the same in 14 days. How long will it take 1 woman to build it alone?
Group D 24/08/2022 (Morning)
(a) 140 days (b) 700 days
(c) 350 days (d) 280 days

Q.33. 6 men and 8 women could finish a work in 14 days. 8 men and 12 women could finish the same work in 10 days. How much time would be taken to finish the same work if one man worked alone?
Group D 24/08/2022 (Morning)
(a) 140 days (b) 175 days
(c) 210 days (d) 280 days

Q.34. A, B and C can do a piece of work in 20, 30 and 60 days, respectively. In how many days can A complete the work if he is assisted by B and C on every third day?
Group D 24/08/2022 (Morning)
(a) 15 days (b) 13 days
(c) 24 days (d) 12 days

Q.35. A and B can together complete a piece of work in 9 days. B and C together can complete the same work in 18 days and C and A together can complete it in 27 days. In how many days can A, B, and C, working together complete the same work?
Group D 26/08/2022 (Morning)
(a) $9\frac{9}{11}$ days (b) $9\frac{7}{11}$ days
(c) $9\frac{8}{11}$ days (d) $8\frac{9}{11}$ days

Q.36. A and B working together can complete a piece of work in 12 days. A alone can complete the same work in 20 days. If B does the work for only half a day every day, then in how many days will A and B together complete the work?
Group D 26/08/2022 (Evening)
(a) $\frac{43}{2}$ (b) $\frac{22}{3}$ (c) 15 (d) $\frac{40}{3}$

Q.37.A and B can do a piece of work in 10 days and 12 days respectively. If they start from A and work alternately, then in how many days the work will be completed?
Group D 26/08/2022 (Evening)
(a) $10\frac{1}{2}$ (b) $10\frac{5}{6}$ (c) $10\frac{1}{4}$ (d) 10

Q.38. Meenu alone can do work in 16 days. Simi alone can do it in 12 days. If Raj joins them, three of them together can complete the work in 4 days. How long will Raj alone take to finish the work?
Group D 29/08/2022 (Morning)
(a) $\frac{111}{2}$ (b) $\frac{12}{7}$ (c) $\frac{48}{5}$ (d) 23

Q.39. Seven men can complete a work in 12 days. They start the work and after 5 days, 3 men leave. In how many days will the remaining work be completed by the remaining men?
Group D 29/08/2022 (Afternoon)
(a) $13\frac{1}{4}$ (b) $12\frac{1}{4}$ (c) 14 (d) 12

Q.40. Aditya and Bhaskar undertake to do a piece of work for ₹15,000. Aditya alone can do it in 15 days while Bhaskar alone can do it in 18 days. With the help of Chandra, they finish it in 6 days. What is Chandra's share?
Group D 30/08/2022 (Evening)
(a) ₹4,000 (b) ₹7,000
(c) ₹5,000 (d) ₹6,000

Q.41. A can do a piece of work in 15 days and B can do the same work in 20 days. The time taken by them working together to do the same work is:
Group D 02/09/2022 (Morning)
(a) $9\frac{4}{7}$ days (b) $8\frac{4}{7}$ days
(c) $7\frac{4}{7}$ days (d) $10\frac{4}{7}$ days

Q.42. Anu is four times as good as Binni in doing work. Together they finish the same work in 12 hours. In how many hrs. will Anu alone finish the work?
Group D 05/09/2022 (Morning)
(a) 11 hrs (b) 13 hrs
(c) 15 hrs (d) 10 hrs

Q.43. A, B and C together can complete a certain work in 40 days. B and C together can complete the same work in 60 days. B is 25% more efficient than A. A, B and C work together for 30 days. B alone will complete the remaining work in:
Group D 05/09/2022 (Afternoon)
(a) 30 days (b) 20 days
(c) 32 days (d) 24 days

Q.44. A and B alone can do a piece of work in 30 days and 40 days respectively. If they work together and get ₹ 2,800 for doing the work, what will be A's share?
Group D 06/09/2022 (Afternoon)
(a) ₹1,200 (b) ₹1,400
(c) ₹1,600 (d) ₹1,500

Q.45. A can do a piece of work in 12 days, and B can do the same work in 20 days. If they work alternately, starting from B, then in how many days will the work be completed?
Group D 06/09/2022 (Afternoon)
(a) $15\frac{1}{5}$ (b) 15 (c) $15\frac{2}{3}$ (d) $15\frac{4}{5}$

Q.46. A and B can do a work in 18 days, B and C can do the same work in 15 days, while A and C can do the work in 12 days. Working together, how much time will they take to complete the work?
Group D 06/09/2022 (Evening)
(a) $8\frac{27}{37}$ (b) $11\frac{27}{37}$ (c) $9\frac{27}{37}$ (d) $10\frac{27}{37}$

Q.47. A can do a piece of work in 12 days. B can do the same work in 15 days. C can do the same work in 9 days. The time taken by them to finish the same work if they work together is:
Group D 08/09/2022 (Morning)
(a) $4\frac{39}{47}$ days (b) $2\frac{39}{47}$ days
(c) $5\frac{39}{47}$ days (d) $3\frac{39}{47}$ days

Q.48. A can complete a piece of work in 35 days. B is 30% less efficient than A. C is 25% more efficient than B. B and C work together for 10 days. A alone will complete the remaining work in:
Group D 08/09/2022 (Afternoon)
(a) 20 days (b) $18\frac{1}{2}$days
(c) 18 days (d) $19\frac{1}{4}$days

Q.49. 12 unskilled and 14 skilled workers together complete a certain piece of work in 9 days. If each unskilled worker takes twice the time taken by a skilled worker to finish the work, in how many days will 12 skilled workers finish the same work?
Group D 08/09/2022 (Evening)
(a) 10 days (b) 15 days
(c) 18 days (d) 12 days

Q.50. A. B and C can complete a piece of work in 20, 24 and 30 days, respectively. The number of days they take to finish it if they work together will be:
Group D 09/09/2022 (Evening)
(a) 8 days (b) 5 days
(c) 6 days (d) 7 days

Q.51. A team of 30 men is supposed to complete a work in 41 days. After 25 days, 6 more men are employed, and the

work is finished one day earlier. By how many days would it have been delayed, if 6 more men were not employed?
Group D 09/09/2022 (Evening)
(a) 2 days (b) 4 days
(c) 3 days (d) 1 days

Q.52. A can complete a certain work in the same time in which B and C together can complete it. If A and B together could complete it in 20 days and C alone in 60 days, then B alone could complete the work in:
Group D 12/09/2022 (Evening)
(a) 60 days (b) 65 days
(c) 70 days (d) 72 days

Q.53. A and B together can complete a piece of work in 5 days, while X and Y together can complete the same work in 20 days. The number of days A, B, X and Y together will take to complete it is:
Group D 12/09/2022 (Evening)
(a) 4 days (b) 5 days
(c) 3 days (d) 6 days

Q.54. A boy can complete a piece of work alone in 10 days, but with the help of his friend he can complete it in 6 days. In how much time will his friend be able to complete the same piece of work alone?
Group D 13/09/2022 (Morning)
(a) 4 days (b) 15 days
(c) $4\frac{1}{2}$ days (d) 8 days

Q.55. X is twice as good a workman as Y and together they finish a piece of work in 14 days. In how many days will X alone finish the work?
Group D 14/09/2022 (Morning)
(a) 22 days (b) 21 days
(c) 28 days (d) 20 days

Q.56. A and B can do a piece of work in 12 days and 8 days, respectively. The number of days required to complete the work if both A and B work together is:
Group D 14/09/2022 (Afternoon)
(a) 4.8 (b) 3.2 (c) 6.4 (d) 2.4

Q.57. 3 men or 4 women can do a job in 15 days. 3 men work for 9 days and leave. The number of women required to complete the remaining work in 12 days is
Group D 15/09/2022 (Afternoon)
(a) 3 (b) 1 (c) 4 (d) 2

Q.58. A and B can do a job in 14 days and 18 days, respectively. A works alone for 6 days and leaves. The number of days required by B to complete the remaining job is :
Group D 15/09/2022 (Evening)
(a) $10\frac{4}{7}$ (b) $10\frac{2}{7}$ (c) $10\frac{3}{7}$ (d) $10\frac{5}{7}$

Q.59. The total amount payable for completing a piece of work is ₹800. C can do it alone in 24 days, while B can do it alone in 8 days. With the help of A, they complete this work in 3 days. What is the sum of money received by A as his share in completing the work?
Group D 19/09/2022 (Morning)
(a) ₹300 (b) ₹450 (c) ₹400 (d) ₹350

Q.60. Sony and Mary can complete a painting in 4 days and 6 days, respectively. They work on same painting on alternate days starting with Mary. In how many days will they together complete the painting?
Group D 19/09/2022 (Evening)
(a) 4.5 (b) 4.75 (c) 5 (d) 5.25

Q.61. A and B can complete a piece of work in 20 days, B and C can complete the same piece of work in 12 days, while C and A can do it in 15 days. In how many days can A, B, and C together complete the same work?
Group D 22/09/2022 (Evening)
(a) 15 (b) 5 (c) 10 (d) 12

Q.62. A, B and C can complete a piece of work in 18 days, 24 days and 60 days, respectively. In how many days will the work be completed, if A works on all days, and is assisted by B and C on alternate days, starting with B assisting A on the first day?
Group D 26/09/2022 (Morning)
(a) $12\frac{1}{9}$ (b) $11\frac{11}{42}$ (c) $11\frac{5}{13}$ (d) $11\frac{10}{13}$

Q.63. A can complete a piece of work alone in 10 days and B can complete the same piece of work alone in 15 days. Working together, A, B and C can complete this work in $4\frac{1}{2}$ days. If B does not work, while A and C work on alternate days, starting with C, then in how many days will the work be completed?
Group D 26/09/2022 (Evening)
(a) $13\frac{1}{9}$ (b) $13\frac{1}{5}$ (c) 13 (d) $12\frac{2}{3}$

Q.64. A can complete $33\frac{1}{3}$% of a piece of work in 10 days and B can complete one-fourth of the same work in 30 days. A, B and C together can complete the same work in 12 days. In how many days will the work be completed if A works on all days, and is assisted by B and C on alternate days, starting with B assisting A on the first day?
Group D 26/09/2022 (Evening)
(a) $18\frac{4}{13}$ (b) $17\frac{1}{3}$ (c) $18\frac{2}{3}$ (d) $17\frac{3}{13}$

Q.65. Aditya can complete a piece of work alone in 8 days and Bhagawan can complete the same piece of work alone in 12 days. They started the work together, but Aditya had to leave 3 days before the completion of the work. In how many days will the work complete?
Group D 27/09/2022 (Morning)
(a) $6\frac{3}{5}$ day (b) $6\frac{4}{5}$days
(c) $6\frac{1}{5}$days (d) $6\frac{2}{5}$days

Q.66. Hema can do a certain piece of work in 21 days. Hema and Raji can together do the same work in 18 days, and Hema, Raji and Smitha can do the same work together in 14 days. In how many days can Hema and Smitha do the same work, working together?
Group D 29/09/2022 (Evening)
(a) $\frac{63}{5}$ (b) $\frac{63}{4}$ (c) 63 (d) $\frac{36}{5}$

Q.67. X people were given a contract for doing a piece of work in 15 days. 3 people did not turn up to work due to sickness. and the rest of the people completed the work in 20 days. What is the value of X?
Group D 30/09/2022 (Morning)
(a) 12 (b) 14 (c) 15 (d) 10

Q.68. 6 men and 10 women complete a work in 10 days. 5 men and 4 women complete the same work in 14 days. How many days will it take for 1 woman to complete the same work?
Group D 30/09/2022 (Afternoon)
(a) 364 (b) 390 (c) 280 (d) 350

Q.69. A and B can do a piece of work in 9 days and 12 days, respectively. A starts the work and they work on alternate days. They can finish the work in:
Group D 06/10/2022 (Morning)
(a) $11\frac{1}{4}$days (b) 11 days
(c) $10\frac{1}{4}$ days (d) 10 days

Q.70. A and B together can complete a piece of work in 5 days. They started working together but after 3 days, B left. If the work is completed after 3 more days, B alone could do the entire work in:
Group D 07/10/2022 (Afternoon)
(a) 7.5 days (b) 15 days
(c) 6.5 days (d) 13 days

Q.71. Shyam and Sundar can do a piece

of work in 16 days and 24 days, respectively. Shyam started the work alone and after 10 days Sundar joined him and the duo worked together till the completion of the work. What was the total time taken for the work to be completed?
Group D 11/10/2022 (Morning)
(a) $13\frac{3}{5}$ days (b) $12\frac{3}{5}$ days
(c) $15\frac{3}{5}$ days (d) $10\frac{3}{5}$ days

Q.72.10 women can do a piece of work in 8 days. 8 men can complete the same work in 12 days. What is the ratio of the amounts of work that can be done in a day by a man and a woman?
Group D 11/10/2022 (Morning)
(a) 3 : 2 (b) 2 : 1 (c) 5 : 6 (d) 4 : 3

Q.73. A and B can do a piece of work in 28 days and 35 days, respectively. They work on alternate days starting with A till the work gets completed. How long (in days) would it take A and B to complete the work?
Group D 11/10/2022 (Evening)
(a) $31\frac{1}{5}$ (b) $31\frac{1}{2}$ (c) 31 (d) $31\frac{1}{9}$

RRB NTPC CBT - 2 (09/05/2022 to 17/06/2022)

Q.74. P, Q, R, can do a piece of work in 40 days, 90 days and 36 days, respectively. P started the work. Q joined him after 7 days. If R joined them after 8 days from the beginning, then for how many days did R work?
Level 6 (09/05/2022) Shift 1
(a) $11\frac{8}{23}$ (b) $12\frac{8}{23}$ (c) $15\frac{8}{23}$ (d) $13\frac{8}{23}$

Q.75. A and B undertake to do a piece of work for ₹18,750. A can do it in 20 days and B can do it in 30 days . With the help of C, they finished it in 8 days. How much should C be paid for his work in proportion?
Level 6 (09/05/2022) Shift 2
(a) ₹7,500 (b) ₹5,000
(c) ₹6,500 (d) ₹6,250

Q.76. To do a certain work, the ratio of the efficiencies of A, B and C is 3 : 5 : 8. Working together, they can complete the same work in 15 days. If only A and B work together for 12 days and leave, and then C comes to complete the remaining work, for how many days will C work?
Level 4 (10/05/2022) Shift 1
(a) 18 (b) 10 (c) 15 (d) 12

Q.77. A, B and C can complete a work in 12, 16 and 24 days respectively. B and C worked together for 4 days then C left the work and A replaced him. In how much days will the remaining work be completed?
Level 4 (10/05/2022) Shift 1
(a) 3 days (b) 5 days
(c) 4 days (d) 2 days

Q.78. Sudhir is 4.5 times as efficient as Aarav. If they work together, they can complete a piece of work in 8 days. How many days will Aarav take to do the same work alone?
Level 5 (12/06/2022) Shift 1
(a) 36 (b) 48 (c) 44 (d) 40

Q.79. A can complete 12% of the work in 15% of the allotted time. A and B worked for the entire period of the allotted time and the work got completed on time. What portion of the work was done by B?
Level 5 (12/06/2022) Shift 1
(a) 10% (b) 20% (c) 15% (d) 25%

Q.80 A can do 75% of the work in 30 days while B can do 50% of the same work in 18 days. If they work together, what fraction of the work will be done in 1 day?
Level 5 (12/06/2022) Shift 2
(a) $\frac{1}{19}$ (b) $\frac{1}{20}$ (c) $\frac{7}{120}$ (d) $\frac{19}{360}$

Q.81 A and B can do a piece of work together in 48 days, while B alone can do the work in 60 days. The duo start working together, but B leaves 15 days before the work gets over. For how many days did A and B work together?
Level 5 (12/06/2022) Shift 2
(a) 33 (b) 48 (c) 42 (d) 45

Q.82. A can do $66\frac{2}{3}$% of work in 8 days . B is 40% less efficient than A. The two work together for 5 days and then both leave. C completes the remaining work in 6 days. In how many days can A and C together complete the original work?
Level 2 (13/06/2022) Shift 1
(a) $9\frac{9}{19}$ (b) $8\frac{8}{19}$ (c) $7\frac{1}{2}$ (d) $7\frac{1}{5}$

Q.83. X and Y can complete a certain work in 18 days and 30 days respectively. Z is 50% more efficient than Y. Z and Y started the work but both had to leave after 4 days. The remaining work was completed by X with the assistance of P in the next 4 days. P alone can complete the original work in
Level 2 (13/06/2022) Shift 2
(a) 8 days (b) 9 days
(c) 12 days (d) 10 days

Q.84. Paras can complete 40% of the work in 8 days while Deepti & Paras together can complete 10% of the work in a day. Find the time taken by Deepti alone to complete the work?
Level 2 (13/06/2022) Shift 2
(a) 21 days (b) 22 days
(c) 23 days (d) 20 days

Q.85. A can complete a piece of work in 10 days. B is 25% more efficient than A. How many days will B alone take to complete the same work?
Level 3 (14/06/2022) Shift 1
(a) 7 days (b) 8 days (c) 6 days (d) 9 days

Q.86. A and B together can complete a piece of work in 36 days while B and C together can do it in 20 days. The efficiency of C is thrice the efficiency of A. B alone can complete two-third of the original work in
Level 3 (14/06/2022) Shift 2
(a) 30 days (b) 45 days
(c) 36 days (d) 40 days

Q.87. A can do a piece of work in 24 days and B can do $\frac{2}{5}$ of the same work in 12 days. Both work together for 6 days. How much work is still left?
Level 3 (14/06/2022) Shift 2
(a) $\frac{9}{20}$ (b) $\frac{11}{20}$ (c) $\frac{17}{20}$ (d) $\frac{13}{20}$

Q.88. 105 people could complete a work in 36 days. But after they worked together for 8 days their employer wanted that the work should be completed in a total of 29 days. How many more workers need to be employed to meet the deadline?
Level 5 (15/06/2022) Shift 1
(a) 40 (b) 35 (c) 28 (d) 42

Q.89. A can do 87.5% of the work in 35 days while B can do 65% of the same work in 23.4 days. If they work together, what fraction of the work will get done in 1 day?
Level 5 (15/06/2022) Shift 2
(a) $\frac{1}{19}$ (b) $\frac{7}{120}$ (c) $\frac{19}{360}$ (d) $\frac{1}{20}$

Q.90. A can complete a piece of work alone in 20 days, B can do it alone in 15 days and C can complete it alone in 18 days. B and C started the work together but both were forced to leave after 4 days. The remaining work was done by A in
Level 2 (16/06/2022) Shift 1
(a) $10\frac{2}{9}$ days (b) 12 days

(c) $9\frac{2}{45}$ days (d) $14\frac{2}{45}$ days

Q.91. P and Q together can complete a job in 20 days. Q and R together can complete the same job in 30 days. P and R together can complete the same job in 30 days. What is the respective ratio of the number of days taken by P when completing the same job alone to the number of days taken by R when completing the same job alone?
Level 2 (16/06/2022) Shift 1
(a) 1 : 2 (b) 3 : 4 (c) 2 : 3 (d) 1 : 3

Q.92. A contractor undertakes to complete a work in 250 days. He employs 300 workers for 50 days and they complete $\frac{1}{2}$ of the work. He then reduces the number of workers to 100, who work for 120 days, after which there are 20 days of holidays. How many workers must be employed after holidays for the remaining period to complete the work on time?
Level 2 (16/06/2022) Shift 2
(a) 74 (b) 68 (c) 50 (d) 80

Q.93. A and B together can do a piece of work in 30 days . Together with C they can complete the same work in 24 days. In how many days can C alone complete the same work?
Level 2 (16/06/2022) Shift 2
(a) 150 (b) 120 (c) 96 (d) 90

Q.94. Radhika can complete a work in 15 days and Rishi can complete the same work in 30 days. Radhika started the work alone and left after 2 days of work. Then Rishi continued the work. Find the time taken by the Rishi to complete the remaining work?
Level 2 (16/06/2022) Shift 3
(a) 26 days (b) 25 days
(c) 23 days (d) 24 days

Q.95. Karthik and Sneha together can do a work in 25 days. Sneha and Madhuri together can do the same work in 20 days. Madhuri and Karthik together can do the same work in 15 days. How long will they take to complete the work, if all three of them work together? (Number of days should be rounded off to the nearest integer).
Level 3 (17/06/2022) Shift 1
(a) 13 days (b) 11 days
(c) 17 days (d) 19 days

Q.96. A can do a certain work in 45 days. B is 50% more efficient than A, and C is 3 times as fast as A. They started the work together but C left 7 days before completion of the work. In how many days was the entire work completed?
Level 3 (17/06/2022) Shift 1
(a) 15 days (b) 18 days
(c) 10 days (d) 12 days

Q.97. 20 people can do a piece of work in 12.5 days. After 8 days, 8 workers left. In how many days will the remaining work be completed?
Level 3 (17/06/2022) Shift 2
(a) 7.5 (b) 8 (c) 9 (d) 6

Q.98. A can do a certain work in 15 days and B can do one-third of the same work in 10 days. A and B work together for 6 days and then A leaves. B completes the remaining work with C in 8 days. A and C together can complete the original work in:
Level 3 (17/06/2022) Shift 3
(a) 12 days (b) 9 days
(c) 15 days (d) 18 days

Q.99. Anmol can complete a piece of work in 25 days. Together with Garima he can complete the same work in 15 days, while Anmol and Aseema working together can complete the same work in 20 days. In how many days can Garima and Aseema working together complete the same work?
Level 3 (17/06/2022) Shift 3
(a) $\frac{300}{11}$ (b) 30 (c) 29 (d) $\frac{250}{9}$

RRB NTPC CBT - 1
(28/12/2020 to 31/07/2021)

Q.100. Shweta and Harish completed a project with an income of Rs 28,000. In this project Shweta worked for 20 days and Harish worked for 30 days. If their daily wages are in the ratio of 5 : 6 , then Shweta's share is :
RRB NTPC 28/12/2020 (Morning)
(a) Rs. 10,000 (b) Rs. 12,000
(c) Rs. 18,000 (d) Rs. 16,000

Q.101. The capacity of working by A and B is in the ratio 3 : 4. If A takes 12 days to finish the work, the time taken by B to finish the same work is :
RRB NTPC 28/12/2020 (Evening)
(a) 9 days (b) 16 days
(c) 18 days (d) 12 days

Q.102. A , B and C can complete a job in 5 days. B , C and D can complete the same job in 10 days. C , D and A can complete the same job in 15 days and D, A and B can complete the same job in 30 days. How long do A , B , C and D together take to finish the job ?
RRB NTPC 29/12/2020 (Morning)
(a) 8 days (b) $8\frac{1}{2}$ day
(c) $7\frac{1}{2}$ days (d) 7 days

Q.103. Avinash, Bhuvnesh and Chaman can complete a piece of work in 20, 30 and 60 days respectively. In how many days can Avinash complete the work if he is assisted by Bhuvnesh and Chaman on every third day ?
RRB NTPC 30/12/2020 (Morning)
(a) 16 (b) 18 (c) 15 (d) 12

Q.104. A and B can complete a job in 40 days and 60 days respectively. They work together for some days and B leaves the job. If A completes the rest of the work in 10 days. Find for how many days B worked ?
RRB NTPC 30/12/2020 (Evening)
(a) 15 days (b) 14 days
(c) 18 days (d) 16 days

Q.105. 15 male employees or 20 female employees of a company can complete a project in 26 days. How long will 30 male employees and 12 female employees together take to complete the project ?
RRB NTPC 04/01/2021 (Morning)
(a) 14 days (b) 10 days
(c) 12 days (d) 8 days

Q.106. Harish and Bimal can complete a task in 20 days. They worked at it for 15 days and then Bimal left. The remaining work was done by Harish alone in 10 days. Harish alone can complete the entire task in :
RRB NTPC 04/01/2021 (Morning)
(a) 40 days (b) 45 days
(c) 35 days (d) 30 days

Q.107. Anil alone can complete a task in 6 days and Bhushan alone can complete it in 8 days. Anil and Bhushan undertook the task for Rs.3,200. With the help of Chaman, they completed the task in 3 days. What is Chaman's share in this earning ?
RRB NTPC 05/01/2021 (Morning)
(a) Rs.375 (b) Rs.600
(c) Rs.400 (d) Rs.800

Q.108. Anil and Balbeer can finish a task in 3 days. They started working together, but after 2 days Anil got injured. Balbeer took 2 more days to finish the task. In how many days can Balbeer alone finish the same task ?
RRB NTPC 05/01/2021 (Morning)
(a) 10 (b) 9 (c) 5 (d) 6

Q.109. Amar Jeet Singh can complete a piece of work in 5 days. With the help of

his son he can complete it in 3 days. In how many days can the son independently complete the work ?
RRB NTPC 05/01/2021 (Evening)
(a) $6\frac{1}{2}$ (b) $7\frac{1}{2}$ (c) $5\frac{1}{2}$ (d) $4\frac{1}{2}$

Q.110. 35 people could complete a work in 24 days. But after they worked together for 6 days, their employer wanted that the work should be completed in a total of 16 days. How many more workers need to be employed to meet the deadline ?
RRB NTPC 05/01/2021 (Evening)
(a) 24 (b) 28 (c) 20 (d) 32

Q.111. Amit alone can complete a piece of work in 15 days and Balbir alone can do the same work in 10 days. If Amit alone works for 3 days after which Balbir joins him, then the work will be finished in how many days ?
RRB NTPC 07/01/2021 (Evening)
(a) $4\frac{4}{5}$days (b) $\frac{1}{6}$days
(c) $\frac{4}{5}$days (d) $7\frac{4}{5}$days

Q.112. Rajni does 25% less work than Mohan and Mohan does 20% more work than Rizwan. At the end of the completion of the work, what will be Mohan's share out of the profit of Rs.930 ?
RRB NTPC 08/01/2021 (Morning)
(a) Rs.350 (b) Rs.360
(c) Rs.300 (d) Rs.260

Q.113. Twelve men can complete a task in 16 days. 32 women can complete the same task in 12 days. 8 men and 8 women worked together for 12 days, after which the women dropped and 8 men joined. In how many days will the men be able to complete the remaining task ?
RRB NTPC 09/01/2021 (Morning)
(a) 3 days (b) 9 days
(c) 2 days (d) 10 days

Q.114. Sixteen men can complete work in 24 days. Twenty four women can complete the same work in 32 days. Sixteen men and sixteen women together worked for twelve days after which women dropped. How many more men are to be taken to complete the remaining work in 2 days ?
RRB NTPC 09/01/2021 (Evening)
(a) 32 (b) 64 (c) 24 (d) 48

Q.115. Sushil can complete a piece of work in 15 h and Bishan can complete the same work in 18 h. If they work together, How much time will they take to complete the work ?
RRB NTPC 10/01/2021 (Morning)
(a) $\frac{11}{90}$h (b) $16\frac{1}{2}$h (c) $8\frac{2}{11}$h (d) $8\frac{1}{4}$h

Q.116. Rajesh can finish the task in 4 days while Mahesh can finish the same task in 3 days. If both of them finish the task together and get paid Rs. 350 in total then find the share of Rajesh.
RRB NTPC 11/01/2021 (Morning)
(a) Rs 100 (b) Rs 150
(c) Rs 200 (d) Rs 140

Q.117. 16 men can complete a work in 12 days. 12 women can complete the same work in 32 days. 16 men and 16 women worked together for 4 days, after which the women dropped out and 16 more men joined. In how many days will the men be able to complete the remaining work ?
RRB NTPC 11/01/2021 (Evening)
(a) 2 days (b) 3 days (c) 4 days (d) 5 days

Q.118. A can complete 25% of a task in 10 days. B can complete 40% of the task in 40 days and C can complete $\frac{1}{3}$of the task in 13 days. Who among them has the fastest speed to complete the task ?
RRB NTPC 12/01/2021 (Morning)
(a) All have the same speed (b) C
(c) A (d) B

Q.119. A man completes a work in 15 days by working 4 h per day for the first 5 days, 5 h per day for next 5 days and 6 h per day for the last 5 days. If he works 8 h per day with half an hour lunch break, he will complete the work in:
RRB NTPC 13/01/2021 (Morning)
(a) 10 days (b) 12 days
(c) 7.5 days (d) 8 days

Q.120. A boy does $\frac{1}{4}$th of the work done by a man in the same time. 15 men complete a particular work in 17 days. If 3 men are replaced by 3 boys, the work will be completed in :
RRB NTPC 13/01/2021 (Morning)
(a) 22 days (b) 20 days
(c) 24 days (d) 18 days

Q.121. 3 boys and 5 girls can finish a project in 6 days, while 2 boys and 7 girls can finish it in 8 days. In how many days will 8 girls complete it ?
RRB NTPC 16/01/2021 (Morning)
(a) 36 (b) 30 (c) 33 (d) 35

Q.122. A can complete a task in the same time in which B and C together can complete it. If A and B together can complete it in 10 days and C alone can complete it in 60 days, then B alone can complete it in.
RRB NTPC 18/01/2021 (Evening)
(a) 22 days (b) 23 days
(c) 21 days (d) 24 days

Q.123. A , B and C can complete a piece of work in 10 days, 15 days and 20 days respectively. If they work together, then the work will be completed in..
RRB NTPC 19/01/2021 (Morning)
(a) $4\frac{9}{13}$ days (b) $4\frac{6}{13}$ days
(c) $4\frac{8}{13}$ days (d) $4\frac{7}{13}$ days

Q.124. A can finish a piece of work in 25 days and B can finish it in 20 days. They work together for 5 days and then A leaves. In how many days will B finish the remaining work ?
RRB NTPC 19/01/2021 (Evening)
(a) 15 days (b) 12 days
(c) 11 days (d) 16 days

Q.125. A can finish a piece of work in 20 days and B can finish it in 24 days. They work together for 10 days then A leaves. In how many days will B finish the remaining work ?
RRB NTPC 20/01/2021 (Evening)
(a) 1 day (b) Half day
(c) 3 days (d) 2 days

Q.126. A alone can complete $\frac{2}{5}$ of a task in 12 days, while B alone can complete $\frac{3}{4}$ of the same task in 25 days. In how many days can they complete the task if they work together ?
RRB NTPC 21/01/2021 (Morning)
(a) $\frac{75}{19}$ (b) $\frac{150}{19}$ (c) $\frac{1}{19}$ (d) $\frac{300}{19}$

Q.127. If Ram can do a task in 20 days and Krishna can do it in 30 days, Then the time taken by both to complete the task working together is..
RRB NTPC 21/01/2021 (Evening)
(a) 12 days (b) 8 days
(c) 15 days (d) 10 days

Q.128. A and B working alone can finish a task in 12 and 16 days respectively. In how many days can the task be finished if they work for one day each alternatively , and A begins the work ?
RRB NTPC 22/01/2021 (Morning)
(a) $12\frac{1}{3}$ days (b) $12\frac{2}{3}$ days
(c) $13\frac{1}{3}$ days (d) $13\frac{2}{3}$ days

Q.129. A can complete a task in 20 days while B can complete it in 30 days. In how many days can A and B working together complete it ?
RRB NTPC 22/01/2021 (Evening)
(a) 4 days (b) 6 days
(c) 8 days (d) 12 days

Q.130. A is twice as efficient as B and together, they finish a piece of work in 20 days. A alone can finish the work in :
RRB NTPC 23/01/2021 (Morning)
(a) 26 days (b) 30 days
(c) 28 days (d) 20 days

Q.131. Working 5 h a day, A can complete a task in 8 days and working 6 h a day , B can complete the same task in 10 days. Working 8 h a day , they can jointly complete the task in :
RRB NTPC 23/01/2021 (Evening)
(a) 4.5 days (b) 5 days
(c) 3 days (d) 6 days

Q.132. A does half as much work as B in three-fourth of the time taken by B. If together they take 12 days to complete the work, how much time shall B take to do it alone ?
RRB NTPC 23/01/2021 (Evening)
(a) 15 days (b) 20 days
(c) 10 days (d) 16 days

Q.133. A is only 40% as efficient as B, C is 50% as efficient as A and B together. If C alone completes the task in 30 days, then A, B and C together can complete the task in :
RRB NTPC 23/01/2021 (Evening)
(a) 8 days (b) 10 days
(c) 5 days (d) 12 days

Q.134. A can finish a task in 16 days and B can finish the same task in one fourth the time taken by A. Working together ,what part of the same task can they finish in a day ?
RRB NTPC 27/01/2021 (Morning)
(a) $\frac{1}{16}$ (b) $\frac{9}{16}$ (c) $\frac{5}{16}$ (d) $\frac{1}{8}$

Q.135. A contractor employs 45 men to dig a canal, 12 km long, in 350 days. After 200 days , he finds that only 4.5 km of the canal has been completed. Find the number of extra men he must employ in order to complete the work on time.
RRB NTPC 27/01/2021 (Evening)
(a) 55 (b) 50 (c) 35 (d) 45

Q.136. A certain number of men can finish a task in 70 days. If 10 more men are added to the existing staff, then the task can be finished in 10 days less. How many men were there originally ?
RRB NTPC 28/01/2021 (Evening)
(a) 50 (b) 70 (c) 60 (d) 40

Q.137. X and Y together can finish a task in 20 days. Y alone can finish the same task in 25 days. In how many days can X alone finish the task ?
RRB NTPC 28/01/2021 (Evening)
(a) 50 (b) 125 (c) 100 (d) 75

Q.138. A alone can finish a task in 30 days. He works for 6 days on the same task and then B finishes it in 24 days. In how many days can A and B together finish the task ?
RRB NTPC 29/01/2021 (Evening)
(a) 20 (b) 15 (c) 10 (d) 25

Q.139. Ram alone can finish a task in 20 days while Shyam alone can finish it in 30 days. How many days will they take to finish the task if they work together ?
RRB NTPC 29/01/2021 (Evening)
(a) 18 (b) 14 (c) 16 (d) 12

Q.140. 14 people can build a wall in 12 days. Another set of 7 people, each one is one fourth as efficient as those in the first group, will be able to complete such a wall in :
RRB NTPC 31/01/2021 (Morning)
(a) 96 days (b) 84 days
(c) 108 days (d) 120 days

Q.141. Ameesha can complete a task by herself in 14 days, while it takes Bhavya 35 days to do it alone. Together with Chitra, they can complete the task in 6 days. How many days will Chitra need to complete the task alone ?
RRB NTPC 31/01/2021 (Evening)
(a) 43 (b) 28 (c) 14 (d) 15

Q.142. Narendra finishes a job in 10 days. Amit completes the same job in 12 days. How many days will it take for both of them to finish the job while working together ?
RRB NTPC 01/02/2021 (Evening)
(a) $5\frac{5}{11}$ (b) $6\frac{5}{11}$ (c) $5\frac{6}{11}$ (d) $6\frac{6}{11}$

Q.143. Sita can clean a hotel in 20 days. Rita can clean the same hotel in 30 days. How many days will they take to clean the hotel together ?
RRB NTPC 01/02/2021 (Evening)
(a) 15 days (b) 12 days
(c) 9 days (d) 18 days

Q.144. A , B and C can complete a task in 36, 54 and 72 days respectively. Together they started the task but A left 8 days before the completion of the task while B left 12 days before the completion. The number of days for which C worked is :
RRB NTPC 02/02/2021 (Morning)
(a) 24 (b) 28 (c) 40 (d) 32

Q.145. 18 skilled workers can complete a task in 12 days while 24 semi-skilled workers need 15 days to complete the same task. 12 skilled workers started the task but 3 of them left after a few days . How many semi - skilled workers should replace the 3 skilled ones who left so that the task can be completed in stipulated time ?
RRB NTPC 02/02/2021 (Evening)
(a) 5 (b) 4 (c) 7 (d) 6

Q.146. Ram and Shyam can finish a task in 6 days working together. Shyam can finish that task alone in 8 days.How much time will Ram alone take to finish it ?
RRB NTPC 03/02/2021 (Evening)
(a) 15 days (b) 12 days
(c) 18 days (d) 24 days

Q.147. Jaya and Hema can clean an apartment in 30 days .Hema and Sushma can do the same task in 40 days, while Jaya and Sushma take 60 days to do it. How many days will it take all three of them working together to clean the apartment ?
RRB NTPC 03/02/2021 (Evening)
(a) $15\frac{2}{3}$ (b) $\frac{2}{3}$ (c) $6\frac{2}{3}$ (d) $26\frac{2}{3}$

Q.148. Karan works twice as fast as Shyam. Working together, they can complete a task in 20 days. In how many days will Karan alone complete the same task ?
RRB NTPC 04/02/2021 (Morning)
(a) 28 days (b) 26 days
(c) 30 days (d) 32 days

Q.149. A tailor can make 5 pieces out of 1 m of cloth. He has 57.6 m of cloth. How many pieces can be made out of this cloth ?
RRB NTPC 04/02/2021 (Morning)
(a) 288 (b) 289 (c) 290 (d) 286

Q.150. X and Y can finish a task in 15 days and 20 days respectively. The capacity of Z is $\frac{5}{2}$ times that of X. Working together in how many days will X , Y and Z finish the same task ?
RRB NTPC 04/02/2021 (Morning)
(a) $3\frac{9}{17}$days (b) $3\frac{8}{17}$days
(c) $3\frac{7}{17}$days (d) $3\frac{6}{17}$days

Q.151. A daily wage labourer was engaged for a certain number of days for Rs. 5850, but being absent on some of those days he was paid only Rs. 5200. What was his maximum possible daily wage ?
RRB NTPC 04/02/2021 (Evening)
(a) Rs. 700 (b) Rs. 650
(c) Rs. 750 (d) Rs. 600

Q.152. Rakesh donates blood twice in 3 years, each time 330 ml. How many litres of blood will he donate in 6 years ?
RRB NTPC 04/02/2021 (Evening)
(a) 1.32 L (b) 1.36 L (c) 1.30 L (d) 1.34 L

Q.153. Vicky can complete a piece of work in 40 days. He worked for 8 days, then Gurpreet Singh finished it in 32 days. In how many days can Vicky and Gurpreet Singh together complete the work ?
RRB NTPC 08/02/2021 (Morning)
(a) 10 days (b) 20 days
(c) 15 days (d) 25 days

Q.154. A alone can complete a work in 12 days and B alone can complete the same work in 18 days. They started working together, but A left after 3 days. In how many days will B alone be able to complete the remaining work ?
RRB NTPC 08/02/2021 (Evening)
(a) 13.5 (b) 15 (c) 10.5 (d) 21

Q.155. A tyre has two punctures. The first puncture alone would have made the tyre flat in 9 min and the second alone would have done it in 6 min. If air leaks out at a constant rate, how long will it take both the punctures together to make the tyre flat ?
RRB NTPC 09/02/2021 (Morning)
(a) $1\frac{1}{2}\ min$ (b) $3\frac{1}{2}\ min$
(c) $3\frac{3}{5}\ min$ (d) $4\frac{1}{4}\ min$

Q.156. A is 50% as efficient as B. C completes half of the task completed by A and B together in a day. If C alone completes the task in 40 days, then A , B and C together can complete the task in :
RRB NTPC 09/02/2021 (Morning)
(a) $13\frac{1}{3} days$ (b) 13 days
(c) $\frac{43}{3} days$ (d) $\frac{1}{3} days$

Q.157. There are 100 students in a hostel. Food provisions for them will last for 20 days. How long will the same food last if 25 more students join the hostel ?
RRB NTPC 11/02/2021 (Morning)
(a) 15 days (b) 16 days
(c) 4 days (d) 10 days

Q.158. A man types at the rate of 35 words per minute. How long will it take for him to type 987 words ?
RRB NTPC 11/02/2021 (Evening)
(a) 28 mins 24 secs (b) 28 mins 12 secs
(c) 28 mins 20 secs (d) 28 mins 36 secs

Q.159. A can lay railway track between two given stations in 16 days and B can do the same job in 12 days. With the help of C, they did the job in 4 days. Considering this, in how many days C alone can do the work
RRB NTPC 11/02/2021 (Evening)
(a) $\frac{5}{48}$days (b) $\frac{16}{5}$days
(c) 48 days (d) $\frac{48}{5}$days

Q.160. A alone can complete a piece of work in 15 days, while B alone can do it in 30 days , if the both of them work on alternate days, when will the work get completed ?
RRB NTPC 11/02/2021 (Evening)
(a) Cannot be determined (b) 24 days
(c) 20 days (d) 18 days

Q.161. A and B can complete a task in 60 days and 40 days respectively. If C who can complete the same task alone in 30 days, joins A & B working together after 3 days, then the number of days taken to complete the task will be.
RRB NTPC 12/02/2021 (Morning)
(a) $11\frac{2}{3}$ (b) 11 (c) $11\frac{1}{3}$ (d) $11\frac{4}{3}$

Q.162. Suresh can finish a job in 10 days and Ramesh can finish it in 12 days. Calculate the fraction of job remaining after they work together for 4 days.
RRB NTPC 15/02/2021 (Evening)
(a) $\frac{8}{15}$ (b) $\frac{7}{15}$ (c) $\frac{4}{15}$ (d) $\frac{1}{10}$

Q.163. The work done by a woman in 6 hr is equal to the work done by a man in 4 hr and by a boy in 8 hr. Working 8 hr per day, if 8 women can complete the work in 10 days, then in how many days can 10 women, 10 men and 10 boys together finish the work working 8 hr per day ?
RRB NTPC 16/02/2021 (Morning)
(a) $2\frac{1}{13}$ (b) $2\frac{6}{13}$ (c) $6\frac{2}{13}$ (d) $1\frac{1}{13}$

Q.164. A takes thrice the time taken by B and five times the time taken by C to complete a work. Working together, they can complete the work in 5 days. Find the number of days taken by A to complete the work alone.
RRB NTPC 16/02/2021 (Morning)
(a) 30 (b) 20 (c) 40 (d) 45

Q.165. A Alone can do work in 39 days. Whereas B alone can do it in 52 days. The duo start working together, but A leaves 3 days before the task gets over. For how many days did the two work together ?
RRB NTPC 17/02/2021 (Evening)
(a) $19\frac{2}{7}$ (b) 21 (c) $20\frac{1}{3}$ (d) 20

Q.166. A alone can do a work in 14 days , whereas B alone can do it in 21 days. B worked alone on day 1 while A works alone on day 2 , and the process continues, till the work is completed. How many days in all does it take for the work to be completed?
RRB NTPC 17/02/2021 (Evening)
(a) 17 (b) 20 (c) 16 (d) 8

Q.167. If 24 men can complete a piece of work in 15 days working 8 h per day, then how many men will be required to complete the same work in 10 days working 6 h per day ?
RRB NTPC 22/02/2021 (Morning)
(a) 32 (b) 60 (c) 30 (d) 48

Q.168. A and B can do a work in 4 hours. B and C can complete the same work in 6 hours, while A and C take 8 hours to complete the work. C can complete the work independently in :
RRB NTPC 23/02/2021 (Morning)
(a) 12 hours (b) 48 hours
(c) 36 hours (d) 24 hours

Q.169. A alone can finish a job in 12 days, while B alone can finish it in 15 days. With the help of C they can finish the same job in 5 days. If they are paid Rs.2,880 for the whole job. What will be the share of C ?
RRB NTPC 27/02/2021 (Morning)
(a) ₹760 (b) ₹740 (c) ₹700 (d) ₹720

Q.170. A and B together finish a task in 12 days. B and C together can finish it in 18 days. If A is three times more efficient than C, then in what time B alone would finish the same task ?
RRB NTPC 27/02/2021 (Evening)
(a) 22 days (b) 25 days
(c) 24 days (d) 20 days

Q.171. A man and a boy, working together, can finish a task in 24 days. If, for the last 6 days, the man works alone, then the task can be finished in 26 days. In how many days can the boy alone finish the task ?
RRB NTPC 01/03/2021 (Morning)

(a) 36 (b) 48 (c) 54 (d) 72

Q.172. A can complete a certain job in 18 days. B is 40% more efficient than A. How many days will B alone take to complete the same job ?
RRB NTPC 01/03/2021 (Evening)
(a) $10\frac{6}{7}$ (b) $10\frac{5}{18}$ (c) $12\frac{6}{7}$ (d) $12\frac{6}{17}$

Q.173. A can complete a task in 20 days. B is 75% more efficient than A. the number of days B will take to complete the same work is :
RRB NTPC 02/03/2021 (Evening)
(a) $10\frac{3}{7}$ (b) $11\frac{3}{7}$ (c) $1\frac{3}{17}$ (d) $1\frac{3}{7}$

Q.174. 2 men and 3 boys can complete a piece of work in 18 days while 3 men and 2 boys can complete the same work in 15 days. In how many days will 4 men and 2 boys complete the work ?
RRB NTPC 02/03/2021 (Evening)
(a) $11\frac{6}{19}$ (b) $11\frac{16}{19}$ (c) $1\frac{1}{19}$ (d) $1\frac{16}{19}$

Q.175. Worker A is thrice as efficient as worker B. They can together finish a task in 18 days. How many days will A alone take to finish the work ?
RRB NTPC 03/03/2021 (Morning)
(a) 24 days (b) 42 days
(c) 12 days (d) 48 days

Q.176. A and B together can do a piece of work in 21 days. With the help of C, they can finish it in 14 days. In how many days will C alone be able to finish the work ?
RRB NTPC 03/03/2021 (Evening)
(a) $\frac{35}{2}$days (b) 7 days
(c) 42 days (d) 35 days

Q.177. To complete a given task, Imran takes 11 days, Tahir takes 15 days and Amla takes 13 days. Working together they finish the task and get Rs. 2,012. What will be the share of Imran provided the daily wage is the same for all ?
RRB NTPC 04/03/2021 (Morning)
(a) Rs.780 (b) Rs.580
(c) Rs.680 (d) Rs.880

Q.178. If Ramu , Rohit and Shyam together can finish a piece of work in 8 days. Ramu alone can complete this work in 16 days and Rohit in 24 days, then Shyam alone can finish this work in how many days ?
RRB NTPC 04/03/2021 (Evening)
(a) 32 (b) 24 (c) 16 (d) 48

Q.179. If Raju is thrice as good a workman as Ravi and takes 20 days less than him to complete a piece of work, then find the time taken by Ravi to complete the work.
RRB NTPC 05/03/2021 (Morning)
(a) 20 days (b) 10 days
(c) 40 days (d) 30 days

Q.180. Ramu and Somu together can complete a task in 10 days. Somu and Dhamu together can complete it in 12 days. Dhamu and Ramu together can complete it in 15 days. If Ramu, Somu and Dhamu work together, in how many days will they complete the task ?
RRB NTPC 05/03/2021 (Evening)
(a) 7 (b) 6 (c) 9 (d) 8

Q.181. Girl can complete a piece of work in 6 days. With the help of her friend, she can complete it in 4 days. In how many days can her friend complete the work alone?
RRB NTPC 07/03/2021 (Morning)
(a) 12 (b) 14 (c) 10 (d) 16

Q.182. Ram can finish a piece of work in 50 days. He worked for 10 days and then stopped. Then Ravi finished the remaining work alone in 32 days. How much time will Ram and Ravi, working together, need to finish the same work?
RRB NTPC 07/03/2021 (Evening)
(a) $24\frac{2}{9}$ days (b) $24\frac{1}{9}$ days
(c) $22\frac{2}{9}$ days (d) $22\frac{4}{9}$ days

Q.183. M completes a task in 20 days and N completes the same task in 30 days. In how many days will both of them complete the same task working together ?
RRB NTPC 09/03/2021 (Morning)
(a) 11 (b) 13 (c) 12 (d) 10

Q.184. Ranga and Raju together can complete a task in 6 days. If Ranga alone can complete the same task in 18 days, then how many days will Raju take to complete the task ?
RRB NTPC 09/03/2021 (Evening)
(a) 6 (b) 7 (c) 8 (d) 9

Q.185. Manvi and Darshan together can complete a project work in 40 days. They worked together for 25 days and then Darshan left. After another 24 days , Manvi completed the remaining project work. In how many days can Manvi alone complete the project ?
RRB NTPC 11/03/2021 (Morning)
(a) 54 (b) 40 (c) 50 (d) 64

Q.186. 21 women can complete a task in 40 days. 30 men can complete the task in 21 days. What is the ratio of the number of days a man will take to complete the task alone to the number of days a woman will need to do that task alone ?
RRB NTPC 11/03/2021 (Evening)
(a) 5 : 3 (b) 2 : 1 (c) 3 : 4 (d) 4 : 3

Q.187. A alone can finish a task in 20 days, while B alone can finish it in 15 days. They work together for 5 days and stop, then the rest of the work is finished by C alone in 2 days. If they get paid Rs.2,400 for finishing the whole task, then find the difference between the daily wages of C and A.
RRB NTPC 11/03/2021 (Evening)
(a) Rs. 350 (b) Rs. 470
(c) Rs. 440 (d) Rs. 380

Q.188. A , B and C can complete a piece of work in 6 , 4 and 10 days , respectively. If they are working together, then the number of days they will take to complete the same work is..
RRB NTPC 13/03/2021 (Morning)
(a) $2\frac{20}{21}$ (b) $1\frac{31}{30}$ (c) $2\frac{21}{20}$ (d) $1\frac{29}{31}$

Q.189. Rama can finish a task in 50 days. He worked for 10 days then Ravi finished the remaining task alone in 32 days. How much time will Rama and Ravi take , working together, to finish the task ?
RRB NTPC 13/03/2021 (Evening)
(a) $24\frac{2}{9}\ days$ (b) $22\frac{2}{9}\ days$
(c) $24\frac{4}{9}\ days$ (d) $24\frac{1}{9}\ days$

Q.190. A and B working together can finish a task in 18 days. B and C working together can finish it in 24 days. A and C working together can finish it in 36 days. In how many days will A, B and C finish the same task, working separately ?
RRB NTPC 14/03/2021 (Evening)
(a) A = 48, B = 144, C = $28\frac{4}{5}$
(b) A = $28\frac{4}{5}$, B = 144, C = 48
(c) A = 48, B = $28\frac{4}{5}$, C = 144
(d) A = $28\frac{4}{5}$, B = 48, C = 144

Q.191. A and B can complete a piece of work in 56 and 70 days respectively. They began the work together but A left after some days and B finished the remaining work in 34 days. After how many days did A leave ?
RRB NTPC 15/03/2021 (Morning)
(a) 16 (b) 9 (c) 12 (d) 15

Q.192. A and B together can complete a task in 36 days. If B stops working after 30 days, the task will be completed in a total of 40 days. A alone can complete the task in :
RRB NTPC 15/03/2021 (Evening)
(a) 60 days (b) 10 days
(c) 50 days (d) 66 days

Q.193. A is twice as good a workman as B, and together they finish a work in 10 days. In how many days will A finish the work alone ?
RRB NTPC 19/03/2021 (Morning)
(a) 15 (b) 5 (c) 10 (d) 7

Q.194. A man and a boy together can complete a task in 60 days. Their efficiency is in the ratio 7 : 5. How many days will the boy alone take to complete the task ?
RRB NTPC 19/03/2021 (Evening)
(a) 140 (b) 138 (c) 142 (d) 144

Q.195. A can finish a work in 25 days and B can finish the same work in 20 days. They work together for 5 days and then A leaves. In how many days will B finish the remaining work ?
RRB NTPC 21/03/2021 (Morning)
(a) 12 days (b) 11 days
(c) 10 days (d) 9 days

Q.196. A group of men decided to complete a task in 10 days, but five of them remained absent. If the rest of the group completed the task in 12 days , Find the original number of men in the group.
RRB NTPC 21/03/2021 (Evening)
(a) 30 (b) 25 (c) 32 (d) 20

Q.197. A vehicle before overhauling requires $\frac{5}{6}$ hr service time every 90 days, while after overhauling it requires $\frac{5}{6}$ hr service time every 120 days. What fraction of the pre - overhauling services time is saved in the latter case ?
RRB NTPC 27/03/2021 (Morning)
(a) $\frac{1}{4}$ (b) $\frac{1}{6}$ (c) $\frac{1}{3}$ (d) $\frac{1}{2}$

Q.198. A can complete in 2 days as much of a task as B can complete in 3 days and B can complete in 4 days as much of the task as C can complete in 5 days. In what time will A , B and C together complete the task if A alone can complete it in 22 days ?
RRB NTPC 27/03/2021 (Morning)
(a) 11 days (b) 14 days
(c) 10 days (d) 12 days

Q.199. 25 women can complete a task in 60 days.After how many days from the start of the task should 5 more women join them so that the task is completed in 55 days ?
RRB NTPC 27/03/2021 (Evening)
(a) 27 (b) 30 (c) 25 (d) 20

Q.200. A, B and C together can do a piece of work in 14 days, whereas C alone can do the same work in 42 days. How long will A and B together take to finish it ?
RRB NTPC 01/04/2021 (Morning)
(a) 28 days (b) 35 days
(c) 21 days (d) 7 days

Q.201. A can do a piece of work alone in 16 days and B can do the work alone in 12 days. Together with C they can complete the work in 3 days. In how many days can C alone do the work ?
RRB NTPC 01/04/2021 (Evening)
(a) $1\frac{7}{16}$ (b) $3\frac{1}{5}$ (c) $6\frac{1}{3}$ (d) $5\frac{1}{3}$

Q.202. P can complete a task in 10 days working 6 hours a day. Q can complete the same task in 9 days working 10 hours a day. If both P and Q work together working 6 hours a day, then in how many days can they complete the task ?
RRB NTPC 03/04/2021 (Morning)
(a) 9 days (b) 10 days
(c) 8 days (d) 6 days

Q.203. A , B and C together can complete a task in 16 days. After, three of them worked together for 2 days , A left. B and C continued for 9 more days and then B left. C completed the remaining work in 6 days. If C alone can complete the entire task in 24 days, then in how many days can B alone complete it.
RRB NTPC 03/04/2021 (Morning)
(a) 36 days (b) 35 days
(c) 30 days (d) 32 days

Q.204. A and B can together finish a field work in 30 days , B and C can together finish it in 40 days while C and A together can finish it in 60 days. How long will they take to finish it together ?
RRB NTPC 03/04/2021 (Evening)
(a) $23\frac{2}{3}$days (b) $26\frac{2}{3}$days
(c) $28\frac{2}{3}$days (d) $24\frac{2}{3}$days

Q.205. Two workers X and Y are engaged to do work. X working alone takes 12 hours more to complete the job than if both work together . If Y worked alone, he would need 27 hours more to complete the job than if they both worked together. How much time would they take to complete the work together ?
RRB NTPC 05/04/2021 (Evening)
(a) 20 hrs (b) 18 hrs (c) 16 hrs (d) 15 hrs

Q.206. A and B together can finish a task in 24 days. They worked at it for 18 days and then C finished the remaining work in 10 days. In how many days can A, B and C together finish the task ?
RRB NTPC 06/04/2021 (Evening)
(a) 32 (b) 24 (c) 15 (d) 34

Q.207. Kiran can complete a task in 15 days. He works for 5 days and then leaves. If Venkat completes the remaining task in 30 days, then in how many days can Venkat alone complete the same task ?
RRB NTPC 07/04/2021 (Morning)
(a) 45 (b) 50 (c) 40 (d) 48

Q.208. A can finish a task in 20 days and B can finish the same task in half the time taken by A. Working together, what part of the task can they finish in a day ?
RRB NTPC 07/04/2021 (Evening)
(a) $\frac{2}{6}$ (b) $\frac{1}{2}$ (c) $\frac{3}{20}$ (d) $\frac{1}{18}$

Q.209. Ram and Shyam can complete a work in 12 and 18 days respectively. They worked together and received Rs. 15,000 for doing the work. How much money did they receive individually ?
RRB NTPC 08/04/2021 (Evening)
(a) Ram=Rs. 6,000 and Shyam= Rs. 9,000
(b) Ram=Rs. 9,000 and Shyam= Rs. 6,000
(c) Ram=Rs.10,000 and Shyam= Rs.5,000
(d) Ram= Rs.7000 and Shyam = Rs. 8000

Q.210. A and B working together can complete a work in 10 days. C alone can complete the same work in 14 days. If A , B and C work together, then how many days will they take to complete three-fifth of the same work ?
RRB NTPC 08/04/2021 (Evening)
(a) 3 (b) $\frac{7}{3}$ (c) $\frac{35}{6}$ (d) $\frac{7}{2}$

Q.211. Anil is twice as efficient as Behu and together they can complete a task in 12 days. In how many days can Anil alone complete the task ?
RRB NTPC 23/07/2021 (Morning)
(a) 25 (b) 18 (c) 15 (d) 7

Q.212. 14 men can complete a task in 9 days and 16 women can complete the same task in 7 days. In how many days can 6 men and 8 women complete the task ?

RRB NTPC 23/07/2021 (Morning)
(a) 7.2 (b) 8.4 (c) 9 (d) 9.6

Q.213. A certain number of men can complete a task in 50 days. If there are 5 men more, then it can be finished in 10 days less. How many men are there initially?
RRB NTPC 24/07/2021 (Evening)
(a) 10 (b) 30 (c) 20 (d) 40

Q.214. A can complete $\frac{1}{3}$ of a work in 5 days and B can do $\frac{2}{5}$ of the work in 10 days. In how many days can both A and B together do the work ?
RRB NTPC 26/07/2021 (Evening)
(a) $4\frac{1}{4}\ days$ (b) $9\frac{3}{8}\ days$
(c) $7\frac{1}{8}\ days$ (d) $8\frac{31}{8}\ days$

Q.215. Ram and Shyam can finish a work in 30 days , Shyam and Bharti can finish it in 40 days and Bharti and Ram can finish it in 60 days. How long will they three together take to finish the work ?
RRB NTPC 31/07/2021 (Morning)
(a) $12\frac{2}{3}$days (b) $15\frac{1}{3}$days
(c) $25\frac{1}{3}$days (d) $26\frac{2}{3}$days

RRB JE (22/05/2019 to 28/06/2019)

Q.216. 42 horses consume 270 kg of corn in 27 days. If there are 21 horses only, then how many days will 300 kg of corn last ?
RRB JE 22/05/2019 (Evening)
(a) 45 (b) 60 (c) 72 (d) 48

Q.217. P alone can do a job in 18 days. P and Q working together can do it in 15 days. They started to work together. After 10 days Q left, and P alone has to complete the job. In how many more days can P complete the remaining job ?
RRB JE 22/05/2019 (Evening)
(a) 5 days (b) 7 days (c) 6 days (d) 8 days

Q.218. P and Q can complete a job in 6 and 8 days individually. They both finish the job with the help of R in 3 days. How much wages are to be paid to R, if the total wages are Rs.3200 ?
RRB JE 23/05/2019 (Evening)
(a) Rs.375 (b) Rs.1200
(c) Rs.400 (d) Rs.320

Q.219. Sufficient food-supply was arranged to last for 30 days for 250 soldiers. If 50 soldiers did not attend the camp, for how many extra days will the food-supply last ?
RRB JE 24/05/2019 (Morning)
(a) 10 days (b) 9 days
(c) 12 days (d) 7.5days

Q.220. P, Q and R can do a work In 15, 20 and 30 days respectively. The contractor decides to put any two of them on the job so as to finish the work earlier. Which of these choices is the best ?
RRB JE 24/05/2019 (Evening)
(a) QR (b) RP (c) PQ (d) Either PQ or QR

Q.221. While executing a job, what 20 women can do in 16 days will be done by 16 men in 15 days. Find the ratio of efficiency of a man to that of a woman.
RRB JE 26/05/2019 (Evening)
(a) 4 : 3 (b) 3 : 4 (c) 5 : 6 (d) 6 : 7

Q.222. P , Q and R work together to finish a work. P and Q finish 70% of the work while Q and R finish 50% of the work. Who will finish first, if they work alone ?
RRB JE 26/05/2019 (Evening)
(a) Q (b) cannot be determined (c) R (d) P

Q.223. If 9 men and 12 boys can do a piece of work in 4 days and 4 men and 16 boys can do the same work in 6 days, then how long will it take for 6 men and 24 boys to do the same work ?
RRB JE 27/05/2019 (Afternoon)
(a) 4 days (b) 7 days (c) 6 days (d) 5 days

Q.224. P and Q can individually do some work in 60 and 75 days respectively. They started working together. But P left after sometime. Q completed the work in another 30 days. In how many days after starting the work did P leave ?
RRB JE 28/05/2019 (Morning)
(a) 25 (b) 24 (c) 20 (d) 32

Q.225. A work is completed by P and Q working together 8 hours per day. Working 8 hours a day P alone will take 12 days to complete work, while working alone Q will take 10 days working 12 hours a day, to complete it. In how many days did they complete the work together ?
RRB JE 28/05/2019 (Afternoon)
(a) $5\frac{1}{4}$days (b) 7 days
(c) $6\frac{2}{3}$ days (d) $6\frac{1}{2}$ days

Q.226. A contractor undertakes to repair loads with 120 men in 124 days. After 64 days, as $\frac{2}{3}$ of the work has been over already. He withdraws some men as surplus. If the work is completed in time, how many men were removed ?
RRB JE 29/05/2019 (Morning)
(a) 40 (b) 64 (c) 72 (d) 56

Q.227. After completing a work together in 2 days, P and Q received Rs. 1200 and Rs.400 respectively as wages. In how many days will Q alone complete the work ?
RRB JE 31/05/2019 (Morning)
(a) 6 days (b) 3 days
(c) $\frac{1}{3}$ days (d) 8 days

Q.228. P completes 80% of a certain work in 20 days. Then with the help of Q, he is able to finish it in 3 more days. How many days will Q take to finish the work, if he works alone ?
RRB JE 31/05/2019 (Evening)
(a) 35 (b) 36.5 (c) 40 (d) 37.5

Q.229. P and Q agree to do a job for Rs.850. Q alone can do it in 40 days. But P is twice as fast as Q . In order to finish the job earlier, they take the help of R and all three finish the work in 8 days. How much should R be paid for his work ?
RRB JE 01/06/2019 (Afternoon)
(a) Rs.240 (b) Rs.340
(c) Rs.300 (d) Rs.320

Q.230. A and B can complete a task in 25 days. B alone can complete $33\frac{1}{3}$% of the same task in 15 days. In how many days can A alone complete $\frac{4}{15}$th of the same task? RRB JE 01/06/2019 (Afternoon)
(a) 15 (b) 10 (c) 18 (d) 12

Q.231. X does half as much work as Y in $\frac{1}{6}$ of time. If together they can complete a job in 10 days, how many days will Y take to complete it, when he works alone ?
RRB JE 02/06/2019 (Morning)
(a) 24 days (b) 30 days
(c) 40 days (d) 35 days

Q.232. A man is capable of finishing a job in 12 days. But a boy can do only one-third of the work done by a man in a day. If the man earns Rs. 525 in one day, then what does the boy get for his work per day ?
RRB JE 26/06/2019 (Morning)
(a) Rs. 225 (b) Rs.220
(c) Rs.175 (d) Rs. 250

Q.233. Two pipes P and Q fill a tank in 15 and 20 minutes respectively. They are both opened, but after 4 minutes, P is turned off. In what time from the start is the tank filled up ?
RRB JE 27/06/2019 (Evening)

(a) 16 minutes
(b) 16 minutes 20 seconds
(c) 14 minutes 20 seconds
(d) 14 minutes 40 seconds

Q.234. P can do 2/5 part of some work in 10 days. If P and Q can do 1/3 part of the same work in 5 days, what is the ratio of their efficiencies ?
RRB JE 27/06/2019 (Evening)
(a) 3 : 4 (b) 4 : 3 (c) 3 : 2 (d) 2 : 3

Q.235. A man, a woman and a boy can do work individually in 3, 4 and 12 days respectively. How many boys are to be employed to help 3 men and 4 women to finish the work in $\frac{1}{4}$ of a day ?
RRB JE 28/06/2019 (Evening)
(a) 12 (b) 20 (c) 24 (d) 28

RRB ALP Tier - 2 (21/01/2019 to 08/02/2019)

Q.236. A can complete 25% of a work in 3 days and B can complete half of the same work in 18 days. If both of them work together, then in how many days can they complete the same work?
ALP Tier II 21/01/2019 (Afternoon)
(a) 6 (b) 12 (c) 9 (d) 15

Q.237. If working together, A, B and C can complete a piece of work in 4 days. However, after starting the work, B left and A and C completed the remaining part of the work in 6 days. If B had to work alone, in how many days would it have taken him to complete the work?
ALP Tier II 21/01/2019 (Afternoon)
(a) 9 (b) 8 (c) 15 (d) 12

Q.238. A can do a piece of work in 15 days, while A and B together can do the same work in 7.5 days. How much time will B take to complete the same work alone?
ALP Tier II 21/01/2019 (Morning)
(a) 20 days (b) 17.5 days
(c) 15 days (d) 12.5 days

Q.239. A and B can do a work in 12 days, B and C can do the same work in 15 days, while A and C can do the same work in 36 days. In how many days will all the three together complete the same work?
ALP Tier II 21/01/2019 (Morning)
(a) 11.15 days (b) 11.25 days
(c) 11.20 days (d) 10.75 days

Q.240. A alone can do a piece of work in 35 days and B alone can do it in 14 days. If they both work on it together for 5 days, how much work is left?
ALP Tier II 23/01/2019 (Morning)
(a) three fourth (b) quarter
(c) one third (d) half

Q.241. L does thrice as much work as M, and together they complete a piece of work in 12 days. In how many days L alone can complete the same work?
ALP Tier II 23/01/2019 (Afternoon)
(a) 48 (b) 16 (c) 40 (d) 32

RPF Constable (17/01/2019 to 19/02/2019)

Q.242. B is twice as efficient as C and A is thrice efficient as B. If they are paid with a salary of Rs.94,842 together. What is the salary received by A?
RPF Constable 18/01/2019 (Morning)
(a) Rs.63,822 (b) Rs.63,825
(c) Rs.63,282 (d) Rs.63,228

Q.243. B is twice as efficient as C and A is thrice as efficient as B. If both of them are Rs. 94248 salary is paid, then how much is the wage to be received by A?
RPF Constable 19/01/2019 (Morning)
(a) Rs. 62286 (b) Rs. 62832
(c) Rs. 65268 (d) Rs. 65682

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.244. Sharan and Mayukh, working together, can complete a task in 18 days. However, Mayukh works alone and leaves after completing one-third of the task. Then, Sharan takes over and completes the remaining work by himself. As a result, the duo could complete the task in 40 days. How many days would Sharan alone have taken to do the job if Mayukh had worked faster than Sharan?
RRB ALP 09/08/2018 (Afternoon)
(a) 30 (b) 45 (c) 24 (d) 72

Q.245. In a computer game, a builder can build a wall in ten hours while a destroyer can demolish such a wall completely in fourteen hours. Both, the builder and the destroyer were initially set to work together on level ground. But after 7 hours the destroyer was taken out. What was the total time (in hours) taken to build the wall?
RRB ALP 09/08/2018 (Afternoon)
(a) 35 (b) 24 (c) 17 (d) 15

Q.246. Surya works 3 times as fast as Ramya and is able to complete a work in 40 days less than the number of days taken by Ramya. Find the time in which they can complete the work together.
RRB ALP 10/08/2018 (Afternoon)
(a) 20 days (b) 30 days
(c) 25 days (d) 15 days

Q.247. A and B can complete a task in 12 days. However, A had to leave a few days before the task was completed and hence it took 16 days in all to complete the task. If A alone could complete the work in 21 days, how many days before the work getting over did A leave?
RRB ALP 10/08/2018 (Afternoon)
(a) 7 (b) 9 (c) 5 (d) 3

Q.248.A and B together can complete a task in 12 days. However, if A works alone, completes half the job and leaves and then B works alone and completes the rest of the work, it takes 25 days in all to complete the work. If B is more efficient than A, how many days would it have taken B to do the work by herself?
RRB ALP 13/08/2018 (Morning)
(a) 22 (b) 20 (c) 18 (d) 15

Q.249. Thirty men can do a piece of work in 16 days working 8 hrs a day. How many men are needed to complete another work, which is twice the first one, in 10 days working 12 hrs a day?
The following are the steps involved in solving the above problem. Arrange them in sequential order.
A) $M_2 = \frac{30 \times 16 \times 8 \times 2x}{x \times 12 \times 10}$
B) $\frac{30 \times 16 \times 8}{X} = \frac{M_2 \times 12 \times 10}{2x}$
C) $\frac{M_1 D_1 H_1}{W_1} = \frac{M_2 \times D_2 \times H_2}{W_2}$
D) $M_2 = 64$
RRB ALP 14/08/2018 (Morning)
(a) BACD (b) ABCD (c) CBAD (d) ACBD

Q.250. A piece of work can be done by 16 men in 8 days working 12 hours a day. How many men are needed to complete another work, which is three times the first one, in 24 days working 8 hours a day ?
RRB ALP 17/08/2018 (Morning)
(a) 23 men (b) 22 men
(c) 25 men (d) 24 men

Q.251. A and B can complete a piece of work in 10 days and 15 days respectively. B starts the work and is joined by A after 5 days. If they earn a total of ₹60, what are their individual shares?
RRB ALP 20/08/2018 (Evening)
(a) ₹20,₹40 (b) ₹25, ₹35
(c) ₹30, ₹30 (d) ₹24, ₹36

Q.252. A can work twice as fast as B. A and C together can work three times as fast as B. If A, B and C complete a job in 30 days working together, in how many days can each of them complete the work.
RRB ALP 21/08/2018 (Evening)
(a) 40,80,100 (b) 50,100,120
(c) 60,120,120 (d) 60,100,80

Q.253. 4 workers working 6 hours per day can finish painting a wall in 21 days. If 7 workers work for 4 hours per day, in how many days will they be able to finish the same work?
RRB ALP 29/08/2018 (Afternoon)
(a) 28 (b) 24 (c) 32 (d) 18

Q.254. A and B can complete a task together in 35 days. If A works alone and completes $\frac{5}{7}$ of the task and then leaves the rest for B to complete by herself, it will take a total of 90 days to complete the task. How many days would it take A, the more efficient among the duo, to complete the entire work by himself?
RRB ALP 29/08/2018 (Afternoon)
(a) 45 (b) 48 (c) 40 (d) 42

Q.255. A and B can complete a piece of task together in 12 days while A alone can do it in 15 days. They start working together but A leaves 10 days before the completion of the task. For how many days did A and B work together?
RRB ALP 29/08/2018 (Evening)
(a) 9 (b) 11 (c) 8 (d) 10

Q.256. Mugdha and Mayuri, working together, can complete a job in 18 days. However, Mayuri works alone and leaves after completing two- fifths of the job and then Mugdha takes over and completes the remaining work by herself. As a result, the duo could complete the job in 39 days. How many days would Mugdha alone have taken to do the job if Mayuri worked faster than Mugdha?
RRB ALP 30/08/2018 (Afternoon)
(a) 45 (b) 24 (c) 72 (d) 30

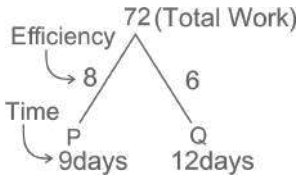
Q.257. Pramod can paint a wall red in 12 hours while Brajen can whitewash the wall completely in 16 hours. If Pramod and Brajen work alternately for an hour each starting when the wall has just cement on it till when it is completely painted red, how many hours will it take to paint the entire wall red?
RRB ALP 31/08/2018 (Afternoon)
(a) 96 (b) 48 (c) 89 (d) 95

Answer Key :-

1.(a)	2.(a)	3.(d)	4.(d)
5.(d)	6.(b)	7.(d)	8.(c)
9.(a)	10.(a)	11.(c)	12.(c)
13.(c)	14.(d)	15.(b)	16.(b)
17.(a)	18.(c)	19.(d)	20.(d)
21.(b)	22.(c)	23.(b)	24.(d)
25.(d)	26.(a)	27.(a)	28.(c)
29.(c)	30.(a)	31.(b)	32.(d)
33.(a)	34.(a)	35.(a)	36.(c)
37.(b)	38.(c)	39.(b)	40.(a)
41.(b)	42.(c)	43.(d)	44.(c)
45.(a)	46.(c)	47.(d)	48.(d)
49.(b)	50.(a)	51.(a)	52.(a)
53.(a)	54.(b)	55.(b)	56.(a)
57.(d)	58.(b)	59.(c)	60.(c)
61.(c)	62.(d)	63.(a)	64.(b)
65.(a)	66.(b)	67.(a)	68.(a)
69.(c)	70.(b)	71.(a)	72.(c)
73.(c)	74.(b)	75.(d)	76.(a)
77.(c)	78.(c)	79.(b)	80.(d)
81.(d)	82.(d)	83.(b)	84.(d)
85.(b)	86.(d)	87.(b)	88.(b)
89.(c)	90.(a)	91.(d)	92.(c)
93.(b)	94.(a)	95.(a)	96.(d)
97.(a)	98.(a)	99.(a)	100.(a)
101.(a)	102.(c)	103.(c)	104.(c)
105.(b)	106.(a)	107.(c)	108.(d)
109.(b)	110.(b)	111.(d)	112.(b)
113.(a)	114.(a)	115.(c)	116.(b)
117.(b)	118.(b)	119.(a)	120.(b)
121.(c)	122.(d)	123.(c)	124.(c)
125.(d)	126.(d)	127.(a)	128.(d)
129.(d)	130.(b)	131.(c)	132.(b)
133.(b)	134.(c)	135.(a)	136.(c)
137.(c)	138.(b)	139.(d)	140.(a)
141.(d)	142.(a)	143.(b)	144.(a)
145.(a)	146.(d)	147.(d)	148.(c)
149.(a)	150.(a)	151.(b)	152.(a)
153.(b)	154.(c)	155.(c)	156.(a)
157.(b)	158.(b)	159.(d)	160.(c)
161.(a)	162.(c)	163.(b)	164.(d)
165.(b)	166.(a)	167.(d)	168.(b)
169.(d)	170.(c)	171.(d)	172.(c)
173.(b)	174.(b)	175.(a)	176.(c)
177.(a)	178.(d)	179.(d)	180.(d)
181.(a)	182.(c)	183.(c)	184.(d)
185.(d)	186.(d)	187.(d)	188.(d)
189.(b)	190.(c)	191.(a)	192.(a)
193.(a)	194.(d)	195.(b)	196.(a)
197.(a)	198.(c)	199.(b)	200.(c)
201.(d)	202.(d)	203.(a)	204.(b)
205.(b)	206.(c)	207.(a)	208.(c)
209.(b)	210.(d)	211.(b)	212.(b)
213.(c)	214.(b)	215.(d)	216.(b)
217.(c)	218.(c)	219.(d)	220.(c)
221.(a)	222.(d)	223.(a)	224.(c)
225.(c)	226.(d)	227.(d)	228.(d)
229.(b)	230.(a)	231.(c)	232.(c)
233.(d)	234.(c)	235.(c)	236.(c)
237.(d)	238.(c)	239.(b)	240.(d)
241.(b)	242.(d)	243.(b)	244.(b)
245.(d)	246.(d)	247.(a)	248.(b)
249.(c)	250.(d)	251.(d)	252.(c)
253.(d)	254.(d)	255.(d)	256.(a)
257.(c)			

Solutions:-

Sol.1.(a)



Working alternatively starting with Q
In first two days work done by Q and P = 8 units + 6 units = 14 units
Now in five similar cycle of 2 days, work done = 14 × 5 = 70 units
Now work left= 72 - 70 = 2 units
Then,

Time taken by Q on 11th day = $\frac{2}{6}$

= $\frac{1}{3}\ day$

Total days = $2 \times 5 + \frac{1}{3} = 10\frac{1}{3}$ days

Sol.2.(a) $6(5M + 6W) = 9(3M + 5W)$
$\Rightarrow 30M + 36W = 27M + 45W$
$\Rightarrow 3M = 9W \Rightarrow 1M = 3W$
Now, 5 men + 6 women = 15 women + 6 women = 21 women
Time taken by 5 men and 6 women = 6 days.
21 women = 6 days
Then, 3 men + 2 women = 9 women + 2 women = 11 women
Time taken by 11 women = $\frac{21 \times 6}{11}$

$= 11\frac{5}{11}\ days.$

Sol.3.(d)

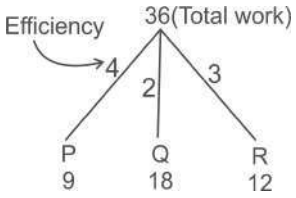
Efficiency of A = $\frac{100}{4}$ = 25 eggs/min

Efficiency of B = $\frac{100}{5}$ = 20 eggs/min

When they work together, number of eggs counted in 1 minute = 25 + 20 = 45
Time taken to count 450 eggs
= $\frac{450}{45}$ = 10 minutes

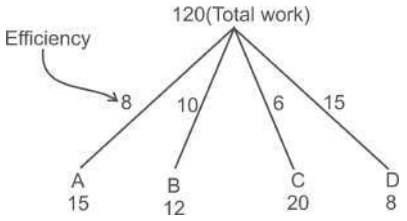
Sol.4.(d) B is 60% more efficient than A.
Efficiency of A : B = 5 : 8
Total work = 5 × 32 = 160 units
B will do this work in = $\frac{160}{8} = 20\ days$

Sol.5.(d)



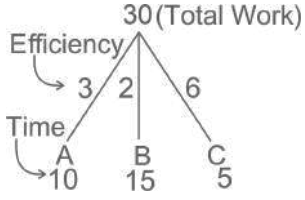
P + Q + R do 9 unit work in 3 days
They will do 36 unit work in
= 12 days

Sol.6.(b)



SUN = Efficiency of A and D = 8 + 15
= 23 units
MOON = Efficiency of B and C = 10 + 6
= 16 units
RED = Efficiency of A and C = 8 + 6
= 14 units
So, the efficiency of team SUN is maximum, so it will finish the work in least time.

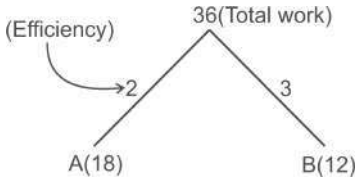
Sol.7.(d) A : C = 1 : 2 and B : C = 1 : 3
Ratio of efficiency of A , B and C = 3 : 2 : 6



Now, they work in this order:
(A + B) first day , (B + C) second day and (C + A) third day
Work done by them in 3 days = 22 units
Work done by (A+B) in next day = 5 units
Remaining work = 30 - (22 + 5) = 3 units
Now, time taken by (B+C) to complete remaining work = $\frac{3}{8}\ days$
Total time taken by them to complete =
3 + 1 + $\frac{3}{8} = 4\frac{3}{8}\ days.$

Sol.8.(c)

A completes the total work in = $\frac{3}{2}$ × 12
= 18 days
B completes the total work in = $\frac{4}{1}$ × 3
= 12 days



so they will complete that work in = $\frac{36}{5}$
= $7\frac{1}{5}$ days

Sol.9.(a) Let the total work = 84 unit
Efficiency of Prakash = $\frac{84}{12}$ = 7
Efficiency of Vinesh = $\frac{84}{14}$ = 6
Work done by Prakash and Vinesh in 3 days = (7 + 6) × 3 = 39 unit
Remaining work = 84 - 39 = 45 unit
Remaining work completed by Prakash in
= $\frac{45}{7}$ days

Sol.10.(a) According to the question,
$\frac{10 \times 8}{50} = \frac{n \times 10}{100}$
n = 16
So, required number of men = 16

Sol.11.(c) Let total work = 30 units
For first 10 days, each day work = 1 unit
So, 10 days work = 10 units
Remaining work = 20 units
Remaining days = 12 days
Per day work required to complete the work = $\frac{20}{30} \times \frac{1}{12} = \frac{1}{18}$

Sol.12.(c) Let their wages be 9x,5x and 4x. Then, 10 unskilled workers will get =
$\frac{10 \times 4}{12 \times 9 + 14 \times 5 + 10 \times 4} \times 13189 = \frac{40}{218} \times 13189 = ₹2420$

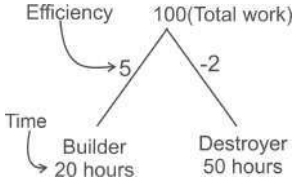
Sol.13.(c) Let, the efficiency of man = M , the efficiency of boy = B
20M + 15B =10 days and
25M +10B = 9 days
Work in both cases is same,
(20 M + 15 B) ×10 = (25 M + 10 B) × 9
⇒ 200M + 150B = 225M + 90B
⇒ 25M = 60B
$\frac{M}{B} = \frac{60}{25} = \frac{12}{5}$
M : B = 12 : 5

Sol.14.(d) Time taken by both punctures to make tyre flat = $\frac{9 \times 6}{9+5} = \frac{54}{15}$
= $3\frac{3}{5}$ minutes.

Sol.15.(b) Time taken by A to finish the book = $\frac{250}{6} = \frac{125}{3} = 41\frac{2}{3}$h
= 41 h 40 min.
Time taken by B to finish the book =
(250 - 72) pages at 8 pages per hour and 72 pages at 4 pages per hour
(∵ double the time ⇒ half the speed)
= $\frac{178}{8} + \frac{72}{4} = \frac{89}{4} + \frac{72}{4} = \frac{161}{4}$
= 40 hrs 15 mins
Person B completes the work first and takes 1 h 25 min less than A.

Sol.16.(b) Appling formula
$\frac{M1 \times D1 \times H1 \times E1}{W1} = \frac{M2 \times D2 \times H2 \times E2}{W2}$
Where → M (man) , D(day),H(hours) ,E(efficiency) and W (Working day)
A/Q ,
$w_1 = w_2$
Let , number of man in group → x
$x \times 10 = (x - 5) \times 12$ ⇒ x = 30 men
Short Tricks :-
When total work is same , then the ratio of days is inversely proportional to number of men.
Days → 10 : 12
Man → 12 : 10
According to question ,
2 units = 5 men
Then , 12 units = 30 men

Sol.17.(a)



Efficiency of both together = + 3
In 30 hours the part of work completed
= 3 × 30 = 90
Remaining work = 100 - 90 = 10
The remaining work completed by Builder in = $\frac{10}{5} = 2\ hours$
Total time = 30 + 2 = 32 hours

Sol.18.(c) Ratio of time = A : B : C : D
= $\frac{2}{3} : \frac{3}{4} : \frac{4}{5} : \frac{1}{5} = 40 : 45 : 48 : 12$
C took the highest amount of time to complete the task.
Sol.19.(d) In 2 minutes = 90 words

In 20 minutes = 900 words
In next 1 minute A types 50 words
In 21 minutes = 950 words
Next minute B type 30 words in
$\frac{3}{4} minutes = 45\ sec$
Total time = 21 minutes 45 sec.

Sol.20.(d)
A can do $\frac{1}{5}th$ of some work in 12 days
A can complete the whole work in
$= 12 \times 5 = 60\ days$
B can do 20% of the same work in 10 days
B can complete the whole work in
$= 10 \times 5 = 50\ days$
C can do $\frac{1}{6}th$ of the work in 8 days
C can complete the whole work in
$= 8 \times 6 = 48\ days$
D can do $\frac{1}{5}th$of the work in 12 days
D can complete the whole work in
$= 12 \times 5 = 60\ days$

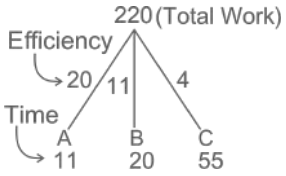
Sol.21.(b)
Banana consumption in one day = 18
12 = one dozen
18 = $\frac{18}{12}$ dozen = $\frac{3}{2}$ dozen

Sol.22.(c) The ratio of the efficiency of type1 and type 2 workers = 3 : 1
Total work = 12 × 3 × 10 = 360 unit
Work done by 4 type1 worker and 8 type 2 workers in a day = 4 × 3 + 8 × 1 = 20 unit
So, the time taken by (4 type1 worker and 8 type2 workers) to complete the whole work = $\frac{360}{20}$ = 18 days

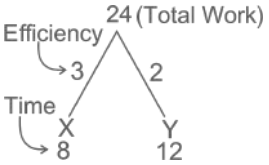
Sol.23.(b) Anit's journey start time
= 2 : 45 : 46 + 0 : 58 : 4 0 = 3 : 44 : 26 p.m.
Arrival time by Anit at his destination
= 4 : 55 : 57 + 0 : 50 : 29 = 5 : 46 : 26 p.m.
So, the total time taken by Anit to complete his journey =
5 : 46 : 26 - 3 : 44 : 26 = 2 hrs 02 min

Sol.24.(d) The sequential order of given statements is :
(B) One day's work of A and B is $\frac{1}{10}$ and one day's work of A is $\frac{1}{15}$
(A) One day's work of B is $\frac{1}{10} - \frac{1}{15}$
(D) One day's work of B is $\frac{1}{30}$
(C) B alone can do the work in 30 days
So, the correct option is (d).

Sol.25.(d) According to the question,
20 women × 15 days = 16 men × 15 days
$\frac{women}{men} = \frac{16}{20} = \frac{4}{5}$
Efficiency of man and woman = 5 : 4

Sol.26.(a)


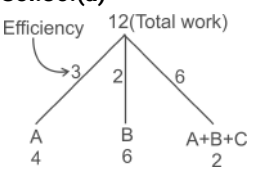
A is assisted by B on odd days, 1st day work = 11 +20 = 31 units
A is assisted by C on even days, 2nd day work = 20 + 4 = 24 units
So, the work done in 2 days = 55 units
Then, the time taken to complete 220 units of work = $\frac{2 \times 220}{55} = 8\ days$

Sol.27.(a)


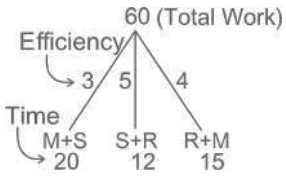
Work done by X and Y in 2 days = 3 + 2 =5 units
So, the work done by X and Y in 8 days = 5x4 = 20 units
Work done on 9th day = 3 units
Time taken by Y to complete remaining work = $\frac{1}{2}$ day
Time taken by (X + Y) to complete the work = $9\frac{1}{2}\ days$.

Sol.28.(c) Let the time taken to complete remaining work be x days
$51 \times 12 = 51 \times 4 + (51 + 6) \times x$
$612 = 204 + 57x$
$57x = 612 - 204$
$\Rightarrow 57x = 408$
$\Rightarrow x = \frac{408}{57} = 7\frac{3}{19}\ days$

Sol.29.(c)B is 25% more efficient than A.
Efficiency of A : B = 4 : 5
Total work = (4 + 5) × 8 = 72 units
A alone will complete the work in
$= \frac{72}{4} = 18\ days$

Sol.30.(a)


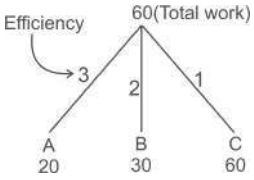
Efficiency of C = 6 - (3 + 2) = 1
C's share = $\frac{1}{6} \times 600 = ₹100$

Sol.31.(b)


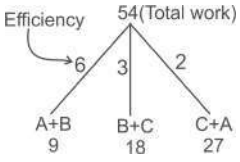
Time taken by all the three girls together
= $\frac{60}{6} = 10\ days$

Sol.32.(d)
(8M + 12W) × 10 = (6M + 8W) × 14
$\Rightarrow 40M + 60W = 42M + 56W$
$\Rightarrow 2M = 4W \Rightarrow$1M =2W
(8M + 12W) can do the work in 10 days.
(16 W + 12W) → $10\ days$
1 woman can do the work in = 10 × 28 = 280 days.

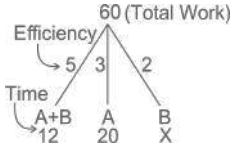
Sol.33.(a)
(6M + 8W) ×14 = (8M +12W) × 10
$\Rightarrow 42M + 56W = 40M + 60W$
$\Rightarrow 2M = 4W \Rightarrow$ 1M = 2W
Ratio of efficiency of Man and woman = 2 : 1
(6 men + 8 women) can complete a work in 14 days
(6 men + 4 men) → $14\ days$
1 man will complete the same work in 14 × 10 = 140 days

Sol.34.(a)


A work for 2 days alone and assisted by B and C on third day,
work completed in 3 days = 3×3+2+1 =12 units
60 unit work will be completed in $\frac{60}{12} \times 3 = 15 days$

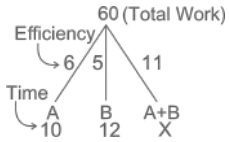
Sol.35.(a)


Efficiency: 2(A + B + C) = 11
Efficiency: (A + B + C) = $\frac{11}{2}$
Therefore, required days = $\frac{54 \times 2}{11}$
= $\frac{108}{11} \Rightarrow 9\frac{9}{11}$days

Sol.36.(c)


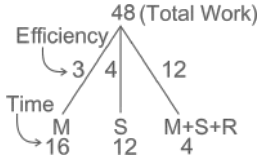
Now, B's efficiency is half = 1
Time taken by A and B to complete the work = $\frac{60}{3+1} = 15\ days$

Sol.37.(b)



A + B can do 11 units in 2 days
They can do 55 units in 10 days.
Remaining 5 units will be done by A in 5/6 days.
So, A + B will complete the work in
$= 10\frac{5}{6}\ days$

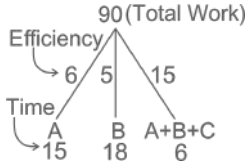
Sol.38.(c)



Raj's efficiency = 12 - (3 + 4) = 5
Time taken by Raj to complete the work = $\frac{48}{5}\ days$

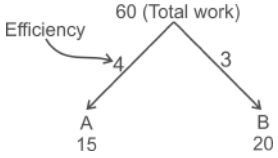
Sol.39.(b)
Let the time taken by them be x days
$7 \times 12 = 7 \times 5 + 4x$
$\Rightarrow 4x = 84 - 35$
$\Rightarrow 4x = 49 \Rightarrow x = 12\frac{1}{4}\ days$

Sol.40.(a)



Chandra's efficiency = 15 - (6 + 5) = 4
Hence, Chandra's share
$= \frac{4}{15} \times 15000 = ₹4000$

Sol.41.(b)



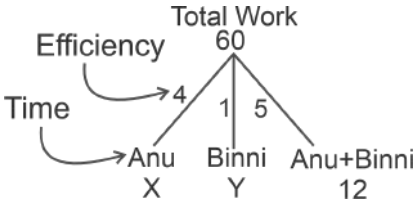
(A + B) will complete the work in = $\frac{60}{7}$
$= 8\frac{4}{7}\ days.$

Sol.42.(c) Ratio of efficiency

⇒	Anu	:	Binni
	4	:	1

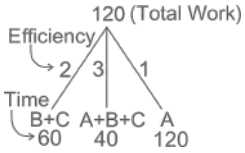
Then the work done by Annu and Binni in 12 days = (4 + 1)×12 = 60 (total work)
Time taken by Anu alone = $\frac{60}{4} = 15\ hrs$

Alternate



Anu is 4 times as efficient as Binni.
Time taken by Anu alone to finish the work = $\frac{60}{4} = 15\ hrs$

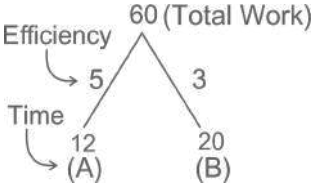
Sol.43.(d)



Ratio of the efficiency of B and A = 5 : 4
[Given B is 25% more efficient than A]
Efficiency of A is 1 then efficiency of B is 1.25
Now, (A + B + C) worked for 30 days, remaining work = 120 - 3 × 30 = 120 - 90 = 30
B will complete the remaining work in $\frac{30}{1.25} = 24\ days$

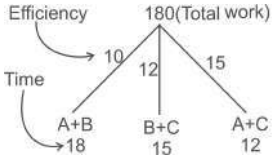
Sol.44.(c) Since both A and B are doing the same work,
Efficiency $\propto \frac{1}{Time}$
$\frac{Efficiency\ of\ A}{Efficiency\ of\ B} = \frac{40}{30} = \frac{4}{3}$
Share will be distributed on the basis of Efficiency
Share of A = $\frac{2800}{7} \times 4 = 1600$

Sol.45.(a)



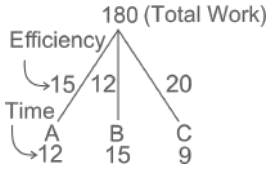
According to the question B starts the work
So work done in 2 days = 5 + 3 = 8 units
Now , work done in 14 days = 56 units
B works on 15th day → now, work done in 15 days = 56 + 3 = 59 units
Therefore, time taken to complete the work = 14 + 1 + $\frac{1}{5}$ =15 $\frac{1}{5}\ days$

Sol.46.(c)



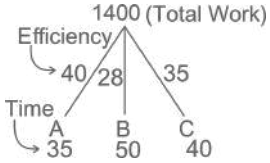
Efficiency of 2(A + B + C) = 37
Efficiency of (A + B + C) = $\frac{37}{2}$
So required days = $\frac{180}{\frac{37}{2}}$
$\Rightarrow \frac{360}{37} = 9\frac{27}{37}$

Sol.47.(d)



So required day = $\frac{180}{15+12+20}$
$\Rightarrow \frac{180}{47} = 3\frac{39}{47}$ days

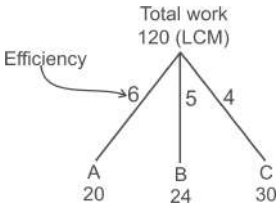
Sol.48.(d)
Ratio of efficiency of A and B is 10 : 7
Ratio of efficiency of B and C is 4 : 5
A : B : C = 40 : 28 : 35



(B + C) worked for 10 days
= (28 + 35) × 10 = 630
Remaining work = 1400 - 630 = 770
Time taken by A to complete the remaining work = $\frac{770}{40} = 19\frac{1}{4}\ days$

Sol.49.(b)
Ratio of time taken by 1 unskilled worker to 1 skilled worker = 2 : 1
Ratio of their efficiency = 1 : 2
Total worked done = (12 × 1 + 14 × 2) × 9
= 9 × (12 + 28) = 9 × 40 = 360
Time taken by 12 skilled workers to complete the same work
$= \frac{360}{12\times2} = 15\ days$

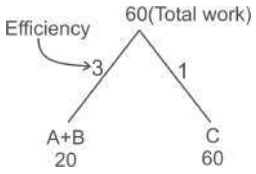
Sol.50.(a)



Required days = $\frac{120}{6+5+4}$ = 8 days

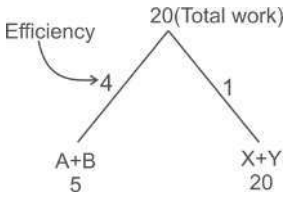
Sol.51.(a) ATQ,
When work completed 1 day earlier
Total work = 30 × 25 + 36 ×15 = 1290
Required days if 6 more men were not employed
$\Rightarrow \frac{1290}{30} = 43$
Required delay in days = 43 − 41 = 2 days

Sol.52.(a) According To the Questions ,
Case 1 :-
Ratio → A : B + C
Efficiency → 1 : 1 or
A : B +C = 2 : 2 .....e.q.(1)
Case 2 :-



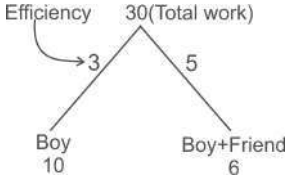
Ratio → A+B : C
Efficiency → 3 : 1 .....e.q.(2)
On solving e.q.(1) and e.q.(2) , we get
Efficiency of B = 1 unit
Therefore Time taken by B to complete the work → $\frac{60}{1}$ = 60 days

Sol.53.(a)



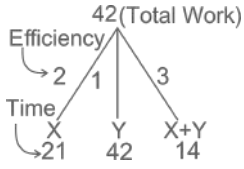
So, No. of days required by A, B, X and Y = $\frac{20}{4+1}$ = 4

Sol.54.(b)



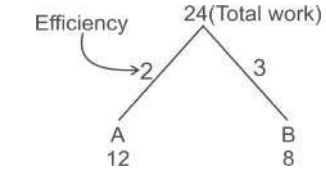
Efficiency of friend = 5 - 3 = 2 units
Time taken by his friend = $\frac{30}{2} = 15\ days$

Sol.55.(b)



Time taken by X to complete the work alone = $\frac{42}{2} = 21 days$

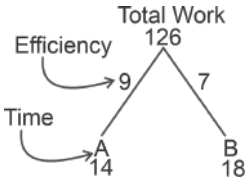
Sol.56.(a)



Time taken by (A+B) to complete the work = $\frac{24}{5} = 4.8\ days$

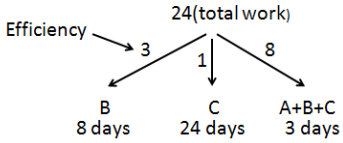
Sol.57.(d) ATQ,
$3M \times 15 = 4W \times 15$
Efficiency of man and woman = 4 : 3
Total work = effic. × time = 4W × 15 = 4 × 3 × 15 = 180 units
Work done by 3men in 9 days = 3 × 4 × 9 = 108 units
Remaining work = 180 - 108 = 72 units
Let x women be required to complete the remaining work.
$\frac{72}{x \times 3} = 12$
$\Rightarrow x = 2$
Hence, 2 women are required.

Sol.58.(b)



Work done by A in 6 days = 9 × 6 = 54 units
Remaining work = 126 – 54 = 72 units
Time taken by b to complete the remaining work = $\frac{72}{7} = 10\frac{2}{7}\ days$

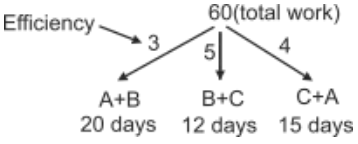
Sol.59.(c)



Efficiency of A = 8 - (3 + 1) = 4
Money received by A = $\frac{4}{8} \times 800 = ₹400$

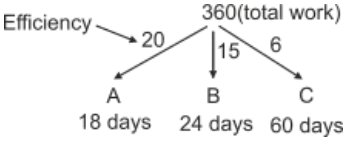
Sol.60.(c) Let the total work = 12 unit
Efficiency of Sony = $\frac{12}{4}$ = 3
Efficiency of Mary = $\frac{12}{6}$ = 2
Work done in 2 days = 2 + 3 = 5 units
Work done in 4 days = 10 units
Again, Mary will start the work. So, Mary will complete the remaining 2 units in 1 day.
So, Total time = 4 + 1 = 5 days

Sol.61.(c)



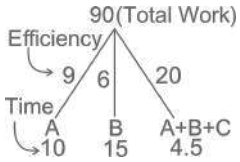
2 (A + B + C) = 12
Efficiency of A + B + C = 6
Time taken by them to complete the work = $\frac{60}{6} = 10\ days$

Sol.62.(d)



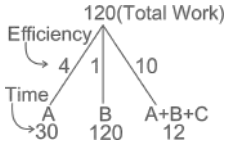
In two days (A + B) and (A + C) do (35 + 26) = 61 units of work.
Then in 10 days → 305 units of work
On 11 th day , 35 units of work will be done by (A + B).
Now, remaining 20 units will be done by (A + C) , in $\frac{20}{26}\ or\ \frac{10}{13}$
Total days = $11\frac{10}{13}\ days.$

Sol.63.(a)



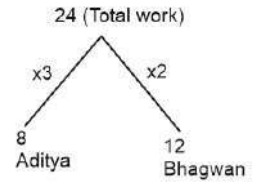
Efficiency of C = 20 - 15 = 5
Now, A + C can do 14 units of work in 2 days.
Then A + C will do 84 units of work in 12 days.
Next day 5 unit work will be done by C .
And remaining 1 unit will be done by A in $\frac{1}{9}\ day$
Time taken by them to complete the work = $13\frac{1}{9}$ days.

Sol.64.(b)
A can complete $\frac{1}{3}rd\ work\ in\ 10\ days.$
Then, A will complete the whole work in 30 days.
B can complete $\frac{1}{4}th\ work\ in\ 30\ days.$
Then, B will complete the whole work in 120 days.



Efficiency of C = 10 - 5 = 5
On first day (A + B) will do 5 unit work.
On second day (A + C) will do 9 unit work.
Then, they can do 14 units of work in 2 days.
So, they will do 112 units work in 16 days .
Next day, (A + B) will do 5 unit work.
And remaining 3 unit work will be done by (A + C) in $\frac{1}{3}days$
Time taken by them to complete the work = $17\frac{1}{3}$ days.

Sol.65.(a)



Let work done in x days
ATQ,
$(x - 3) \times 3 + x \times 2 = 24$
$\Rightarrow 3x - 9 + 2x = 24 \Rightarrow 5x = 33$
Therefore $x = 6\frac{3}{5}$ days

Sol.66.(b) let total work = L.C.M. of 21, 18, 14 = 126 units
Efficiency of Hema = $\frac{126}{21} = 6$
Efficiency of Hema and Raji = $\frac{126}{18} = 7$
Efficiency of Hema, Raji and Smitha = $\frac{126}{14} = 9$
Efficiency of Raji = 7 - 6 = 1
Efficiency of Smitha = 9 - 6 - 1 = 2
Time taken by Hema and Smitha to complete the work = $\frac{126}{6+2} = \frac{63}{4}$

Sol.67.(a) According to the question,
x × 15 = (x - 3) × 20
15x = 20x - 60 ⇒ 5x = 60 ⇒ x = 12
So, possible value of x = 12

Sol.68.(a)
(6M + 10W) × 10 = (5M + 4W) × 14
60M + 100W = 70M + 56W
44W = 10M ⇒ M : W = 22 : 5
Let 1 woman takes D days
{6(22) + 10(5)} × 10 = 1(5) × D
182 × 10 = 5 × d ⇒ D = 364

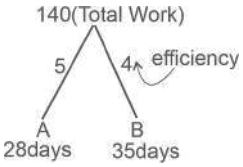
Sol.69.(c) Let the total work = L.C.M. of 9 and 12 = 36 unit
Efficiency of A = $\frac{36}{9} = 4$
Efficiency of B = $\frac{36}{12} = 3$
Work done in 2 days = (4 + 3) unit = 7 unit
Work done in 10 days = 35 unit
Time taken by A to complete the remaining work = $\frac{1}{4}$
Total time taken to complete the work = $10 + \frac{1}{4} = 10\frac{1}{4}$ days

Sol.70.(b) Let the total work = 15 unit
Efficiency of A + B = $\frac{15}{5} = 3$
Work done by A + B in 3 days = 3 × 3 = 9 unit
Remaining work = 15 - 9 = 6 unit
Efficiency of A = $\frac{6}{3} = 2$
Efficiency of B = 3 - 2 = 1
Time taken by B to complete the entire work = $\frac{15}{1}$ = 15 days

Sol.71.(a) Let the total work = 48 units
Efficiency of Shyam = $\frac{48}{16} = 3$
Efficiency of Sundar = $\frac{48}{24} = 2$
Work done by Shyam in 10 days = 3 × 10 = 30 unit
Remaining work = 48 - 30 = 18 unit
Time taken by Shyam and Sundar to complete remaining work = $\frac{18}{2+3} = 3\frac{3}{5}$
Total time = $10 + 3\frac{3}{5} = 13\frac{3}{5}$ days

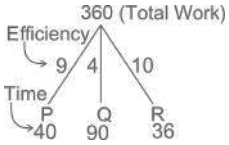
Sol.72.(c) According to question,
10W × 8 = 8M × 12
M : W = 5 : 6
Required ratio = 5 : 6

Sol.73.(c)



Work done in 2 days = 5 + 4 = 9 unit
Work done in 30 days = 135 unit
Remaining 5 unit will be done by A in 1 day
Total time = 30 + 1 = 31 days

Sol.74.(b)

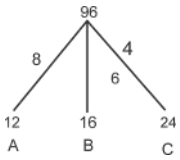


Total work = LCM of time taken = LCM (40, 90, 36) = 360 units
Let the work be completed in n days.
According to the question,
9n + 4(n − 7) + 10(n − 8) = 360
9n + 4n − 28 + 10n − 80 = 360
23n = 468 ⇒ n = $\frac{468}{23}$
So, number of days R worked = n − 8
= $\frac{468}{23} - 8 = \frac{284}{23} = 12\frac{8}{23}$ days

Sol.75.(d) Part of work done by A and B in 8 days = $\frac{8}{20} + \frac{8}{30} = \frac{2}{3}$
Remaining part of the work = $1 - \frac{2}{3} = \frac{1}{3}$.
Work done by C = $\frac{1}{3}$, so money earned by him = $\frac{1}{3} \times 18750 = 6250$.

Sol.76.(a)
Ratio of efficiency of A : B : C = 3 : 5 : 8
Total efficiency = 16
Number of days to complete the work = 15
Total work = Total efficiency× Total days
= 16 × 15 = 240 units
Now according to the question
Let C works for x days
(A + B) × 12 + C × (x) = 240
8 × 12 + 8x = 240 , 8x = 240 - 96 = 144
x = 18 days

Sol.77.(c) Let total work = 96 units
Efficiency of A,B,C is 8, 6 and 4 respectively



let B and A together works for x days
(B + C) × 4 + x (B + A) = 96
10 × 4 + 14x = 96
14x = 56 ⇒ x = 4

Sol.78.(c) Efficiency ratio of Sudhir and Aarav = 9 : 2
Total work = (9 + 2) × 8 = 88 unit
Time taken by Aarav to complete the work = $\frac{88}{2}$ = 44 days

Sol.79.(b) Let the total time taken by them is 100 minutes.
So, 15% of 100 minutes = 15 minutes
Now,
12% of work is completed in 15 minutes by A.
4% of work is completed in 5 minutes by A.
80% of work is completed in 100 minutes by A.
If A can complete 80% in 100 minutes then, B will complete remaining portion i.e. (100 - 80) = 20%

Sol.80.(d) A takes 30 days to complete 75% of the work .
So, total time of A = 40 days
B can do 50% of the work in 18 days.
So, total time of B = 36 days
Work done in 1 day = $\frac{1}{40} + \frac{1}{36}$
= $\frac{9+10}{360} = \frac{19}{360}$

Sol.81.(d) Let the total work = 240 unit
Efficiency of A and B = $\frac{240}{48} = 5$
Efficiency of B = $\frac{240}{60} = 4$
Efficiency of A = 5 - 4 = 1
Let the work be completed in x days.
1 × x + 4(x - 15) = 240
x + 4x - 60 = 240 ⇒ 5x = 300 ⇒ x = 60
So, required number of days = 60 - 15 = 45

Sol.82.(d) $66\frac{2}{3}\% \rightarrow \frac{2}{3}$

A can do $\frac{2}{3}$ of work in 8 days.
So, A can complete the whole work in 12 days.
B is 40% less efficient than A.
Ratio of efficiency of A and B = 5 : 3
So, B can complete the whole work in 20 days.
Let the total work = 60 unit
Efficiency of A = $\frac{60}{12}$ = 5
Efficiency of B = $\frac{60}{20}$ = 3
Total work in 5 days by A + B = 5(5 + 3) = 40 unit
Remaining work = 60 - 40 = 20 unit
Efficiency of C = $\frac{20}{6} = \frac{10}{3}$
Time taken by A + C = $\frac{60}{5+\frac{10}{3}}$
$= \frac{60\times 3}{25} = 7\frac{1}{5}$

Sol.83.(b) Let the total work = 90 unit
Efficiency of X = $\frac{90}{18}$ = 5
Efficiency of Y = $\frac{90}{30}$ = 3
Efficiency of Z = 150% of 3 = 4.5
Work done by Z and Y = (3 + 4.5) × 4 = 30 unit
Remaining work = 90 - 30 = 60 unit
Efficiency of X + P = $\frac{60}{4}$ = 15 unit
Efficiency of P = 15 - 5 = 10 unit
Time taken by P to complete the work = $\frac{90}{10}$ = 9 days

Sol.84.(d) Paras can complete 40% of the work in 8 days
Paras can complete whole work in =20 days
Deepti and Paras together can complete 10% of the work in 1 day
Deepti and Paras together can complete the whole work in = 10 days
Let the total work = 20 unit
Efficiency of paras = $\frac{20}{20}$ = 1
Efficiency of Deepti + Paras = $\frac{20}{10}$ = 2
Efficiency of Deepti = 2 - 1 = 1
Time taken by Deepti = $\frac{20}{1}$ = 20 days

Sol.85.(b) Let the total work = 40 unit
Efficiency of A = $\frac{40}{10}$ = 4
Efficiency of B is 25% more than A
Efficiency of B = 5
Time taken by B to complete the work = $\frac{40}{5}$ = 8 days
Short trick:-
25% = 1/4
Efficiency of A : B = 4 : 5
Time of A : B = 5 : 4
As per question,
5 unit = 10 days ⇒ 4 unit = 8 days
So, Time taken by B = 8 days

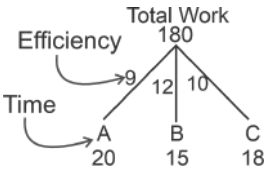
Sol.86.(d) Let the total work = 180 unit
Efficiency of A + B = $\frac{180}{36}$ = 5
Efficiency of B + C = $\frac{180}{20}$ = 9
Efficiency of A : C = 1 : 3 or 2 : 6
Efficiency of A = 2, B = 3 and C = 6
Time taken by B to complete two-third work = $\frac{180\times\frac{2}{3}}{3}$ = 40 days

Sol.87.(b) B can do 2/5 of the same work in 12 days
B can do whole work in = 30 days
Let the total work = 120 unit
Efficiency of A = $\frac{120}{24}$ = 5
Efficiency of B = $\frac{120}{30}$ = 4
Work done in 6 days = (5 + 4) × 6 = 54 unit
Remaining work = 120 - 54 = 66 unit
Work left = $\frac{66}{120} = \frac{11}{20}$

Sol.88.(b) As per question,
105 × 36 = 105 × 8 + (x + 105) × 21
3780 = 840 + 21x + 2205
3780 - 840 - 2205= 21x
21x = 735 ⇒ x = 35
So, required number of men = 35

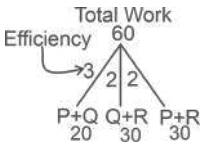
Sol.89.(c)
A can do 87.5% work in 35 days
A will do 100 % work in $\frac{35\times 100}{87.5}$ $= 40\ days$
B can do 65% of work in 23.4 days
B will do 100% work in $\frac{23.4\times 100}{65}$ $= 36\ days$
(A + B)'s 1 day work = $\frac{1}{40} + \frac{1}{36}$
$= \frac{19}{360}$

Sol.90.(a)



(B+C)'s 4 day work = 22 × 4 = 88 work
Remaining work done by A in = $\frac{180-88}{9} = \frac{92}{9} = 10\frac{2}{9}\ days$

Sol.91.(d)

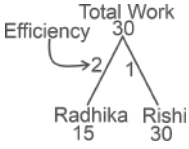


2(P + Q + R) = 7
P will complete work in
$= \frac{60}{\frac{7}{2}-2} = 40\ days$
R will complete work in
$= \frac{60}{\frac{7}{2}-3} = 120\ days$
Required ratio = $\frac{40}{120} = 1:3$

Sol.92.(c) $\frac{1}{2}$ work done by 300 workers who work for 50 days = 300 × 50 =15000
Now, work done by 100 workers in 120 days =100 × 120 =12000
Remaining work = 15000 - 12000 = 3000
Remaining days = 250 - (50 + 120 + 20) = 60 days
Workers required = $\frac{3000}{60} = 50\ workers$

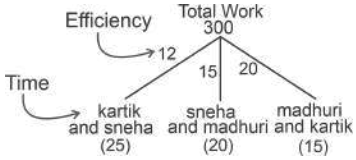
Sol.93.(b) (A + B)'s 1 day work = $\frac{1}{30}$
(A + B + C)'s 1 day work = $\frac{1}{24}$
C's 1 day work = $\frac{1}{24} - \frac{1}{30} = \frac{1}{120}$
C will complete work alone in $120\ days.$

Sol.94.(a)



Work done by Radhika in 2 days = 2 × 2 = 4 unit
Remaining work done by Rishi in = $\frac{26}{1}$ $= 26\ days$

Sol.95.(a)



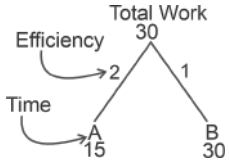
(Kartik+Sneha+Madhuri)'s efficiency = $\frac{47}{2}$
Work completed by them in $= \frac{300\times 2}{47}$ $= 13\ days$

Sol.96.(d) Efficiency of A : B = 2 : 3 and efficiency of A : C = 2 : 6
A : B : C = 2 : 3 : 6
A complete the work in 45 days, total work = 45 × 2=90

Let (A + B + C) work together for x days.
$11x = 90 - 35 \Rightarrow 11x = 55 \Rightarrow x = 5$
So, the entire work was done in = 5 + 7 =12 days.

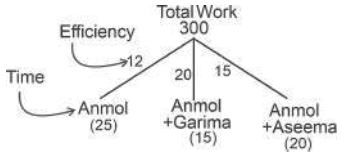
Sol.97.(a) Let the remaining work be completed in x days.
⇒ 20 × 12.5 = (20 × 8) + (12 × x)
⇒ 12x = 250 -160 ⇒ $x = \frac{90}{12} = 7.5\ days$

Sol.98.(a) B can do one-third of work in 10 days so B will complete work in 30 days.



(A+B)'s efficiency = 2 + 1 = 3
(A+B)'s 6 days work = 6 × 3 = 18 units
Remaining work = 30 - 18 = 12 units
(B+C)'s efficiency = $\frac{12}{8} = \frac{3}{2}$
C's efficiency = $\frac{3}{2} - 1 = \frac{1}{2}$
(A+C)'s will complete the whole work =
$\frac{30}{2 + \frac{1}{2}} = 12\ days$

Sol.99.(a)



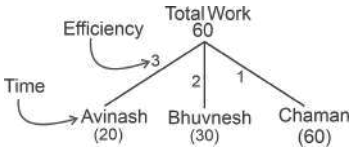
Garima's efficiency = 20 - 12 = 8
Aseema's efficiency = 15 - 12 = 3
Garima + Aseema will complete the work in $\frac{300}{11} days$

Sol.100.(a) In the project Shweta worked for 20 days and Harish worked for 30 days and their daily wages are in the ratio of 5 : 6 , Then
Shweta's share : Harish's share
5 × 20 : 6 × 30 = 5 : 9
As Shweta and Harish completed the project with an income of Rs 28,000
So, from the total income , Shweta's share is = 28000 × $\frac{5}{14}$ = 10,000 Rs.

Sol.101.(a) The capacity of working by A and B is in the ratio 3 : 4.
A complete work in 12 days then , total work = 12 × 3 = 36
B will complete the work = $\frac{36}{4}$ = 9 days.

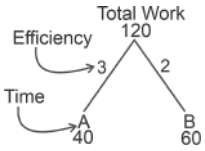
Sol.102.(c)
A , B and C can complete a job in 5 days
⇒ A , B and C's one day's work = $\frac{1}{5}$
B , C and D can complete the same job in 10 days
⇒ B , C and D's one day's work = $\frac{1}{10}$
C , D and A can complete the same job in 15 days
⇒ C , D and A's one day's work = $\frac{1}{15}$
D , A and B can complete the same job in 30 days
⇒ D , A and B's one day's work = $\frac{1}{30}$
So, if we add them,
3 × (A + B + C + D)'s one day's work =
$(\frac{1}{5} + \frac{1}{10} + \frac{1}{15} + \frac{1}{30}) = \frac{2}{5}$
⇒ (A + B + C + D)'s one day's work
= $\frac{1}{3} \times \frac{2}{5} = \frac{2}{15}$
⇒ (A + B + C + D) together take $\frac{15}{2}$ = 7.5 days to finish the same work.

Sol.103.(c)



Avinash is assisted by Bhuvnesh and Chaman on every third day,
i.e. their 3 day's work = 3 × 3 + 2 + 1
= 12 units.
So, 60 units of work will get completed in
= $\frac{60}{12} \times 3$ = 15 days.

Sol.104.(c)



Work done by A in 10 days = 10 × 3
= 30 units
Remaining work = 120 - 30 = 90 units
Remaining work done by A and B in
= $\frac{90}{3+2} = \frac{90}{5}$ = 18 days

Sol.105.(b) Efficiency of male = M
Efficiency of female = F
ATQ ,
15M × 26 = 20F × 26
15M = 20F
3M = 4F
9M = 12F
We can put, 12F = 9M
So, 30M + 12F = 30M + 9M = 39 M
15 male can do the work in 26 days
∴ 1 male = 26 × 15
∴ 39 M = $\frac{26 \times 15}{39}$ = 10 days.

Sol.106.(a) Harish and Bimal can complete a task in 20 days.
They worked together for 15 days.
So, in 15 days, $\frac{3}{4}$th work was completed.
Remaining work = $\frac{1}{4}$th
Harish completes the remaining work in 10 days that means harish can complete $\frac{1}{4}$th work in 10 days.
∴ Harish can complete the entire task in = 10 × 4 days = 40 days.

Sol.107.(c) Anil alone can complete a task in 6 days ,
Bhushan alone can complete it in 8 days.
So, together they finish the work in
= $\frac{6 \times 8}{6+8} = \frac{24}{7}$ days.
Now, let Chaman complete the work alone in C days.
Then, three of them will complete the work in = $\frac{\frac{24}{7} \times C}{\frac{24}{7} + C} = \frac{24C}{24 + 7c}$ days
According to the question ,
$\frac{24C}{24 + 7c} = 3 \Rightarrow C = 24$ days.
As we know, ratio of the share of the money = ratio of efficiency
= $\frac{1}{6} : \frac{1}{8} : \frac{1}{24}$ = 4 : 3 : 1
So, Chaman's share in this earning
= $\frac{1}{8} \times 3200 = 400$ rs.

Sol.108.(d) Anil and Balbeer can finish a task in 3 days
⇒ Anil and Balbeer's one day's work = $\frac{1}{3}$
As they have worked 2 days together, i.e.
work done = 2 × $\frac{1}{3} = \frac{2}{3}$
Remaining work = $1 - \frac{2}{3} = \frac{1}{3}$
Now, let Balbeer finishes the work alone in x days.
According to the question ,
$\frac{1}{x} \times 2 = \frac{1}{3} = 2 \Rightarrow x = 6$

Sol.109.(b) Son can complete the work in = $\frac{3 \times 5}{5-3} = \frac{15}{2} = 7\frac{1}{2}$ days.

Sol.110.(b) In 6 days they completed $\frac{1}{4}$ th of the work.
Total work should be completed in 16 days, so the remaining work ($\frac{3}{4}$th), must be completed in 10 days.
$\frac{35 \times 24}{1} = \frac{M \times 10}{\frac{3}{4}}$
$\frac{35 \times 24}{1} = \frac{M \times 10 \times 4}{3} \Rightarrow$ M = 63

∴ extra people = 63 - 35 = 28

Sol.111.(d)
Total work = LCM of (15 and 10) = 30
Efficiency of Amit = $\frac{30}{15}$ = 2
Efficiency of Balbir = $\frac{30}{10}$ = 3
Work completed by Amit in 3 days
= 3 × 2 = 6
Remaining work = 24
Time to complete remaining work by Both = $\frac{24}{2+3}$ = $4\frac{4}{5}$ days
Total time = 3 + $4\frac{4}{5}$ = $7\frac{4}{5}$ days.

Sol.112.(b)
Ratio → Rajini : Mohan : Rizwan
Efficiency → 3 : 4
6 : 5

Rajini : Mohan : Rizwan = 9 : 12 : 10
Share of Mohan = 930 × $\frac{12}{31}$ = Rs 360

Sol.113.(a) M = Men , W = Women
12M × 16 = 32W × 12
M = 2W ⇒ M : W = 2 : 1
Total work = 12 × 16 × 2 = 384
8M + 8W = 8M + 4M = 12M
12M will work in 12 days = 12 × 12 × 2
= 144 × 2 = 288
Remaining work = 384 - 288 = 96
16M will do remaining work in $\frac{96}{32}$
= 3 days.

Sol.114.(a) Let the efficiency of man = M and Efficiency of woman = W
16 M × 24 = 24 W × 32
⇒ M : W = 2 : 1
⇒ Total work = work done by 16 men in 24 days = 768 units
Work done by 16 men and 16 women in 12 days = (16 × 2 + 16 × 1) × 12 = 576 units
Work done by 16 men in 2 more days
= (16 × 2) × 2 = 64 units
Remaining work = 768 - 576 - 64 = 128 units
Extra men required = $\frac{128}{2 \times 2}$ = 32

Sol.115.(c) Sushil can complete a piece of work in 15 h and Bishan can complete the same work in 18 h.
So, when they work together, the time they take to complete the work :
= $\frac{15 \times 18}{(15 + 18)} = \frac{90}{11} = 8\frac{2}{11}$h

Sol.116.(b)

	Rajesh		Mahesh
Time →	4	:	3
Efficiency →	3	:	4

Share of Rajesh = $\frac{3}{7}$ × 350 = Rs150

Sol.117.(b) Let the efficiency of man = M
And efficiency of women = W
A/Q, 16M × 12 = 12W × 32
⇒ M = 2W ⇒ $\frac{M}{W} = \frac{2}{1}$
Total work = 32 × 12 = 384
Work completed in 4 days by 16 men and 16 women
= (16 × 2 + 16 × 1) × 4
= 48 × 4 = 192
Remaining work = 384 - 192 = 192
Time to complete the remaining work by 32 men = $\frac{192}{32 \times 2}$ = 3 days

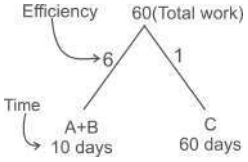
Sol.118.(b) A can complete the whole work in 10 × 4 = 40 days
B can complete the same work in
= 40 × 2.5 = 100 days
C can complete the same work in
= 13 × 3 = 39 days
So, C is most efficient.

Sol.119.(a)
Total work = 4 × 5 + 5 × 5 + 6 × 5 = 75
When a man works 8 h per day with half an hour rest, Hours per day= 7.5 h
Time taken = $\frac{75}{7.5}$ = 10 days

Sol.120.(b) If efficiency of man = 4
Efficiency of boy = 1
Total work = 15 × 17 × 4 = 1020
When 3 boys replaced 3 men , let the work completed in x days
Total work = (12 × 4 + 3 × 1) × x = 51x
Now, 51x = 1020 ⇒ x = 20 days.

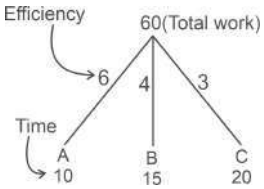
Sol.121.(c) Let the efficiency of boy = B
And efficiency of girl = G
(3B + 5G) × 6 = (2B + 7G) × 8
⇒ 18B + 30G = 16B + 56G
⇒ 2B = 26G ⇒ $\frac{B}{G} = \frac{13}{1}$
Total work = $(3 \times 13 + 5 \times 1) \times 6$
= 264
Time taken by 8 girls to complete the work = $\frac{264}{8}$ = 33 days.

Sol.122.(d)
Efficiency → A : (B + C) = 1 : 1 .....(i)



Efficiency → (A + B) : C = 6 : 1 .....(ii)
From equation (i) and (ii), we get
Efficiency of A = 7
Efficiency of B = 5
Efficiency of C = 2
So, Total work (As per C)= 2 × 60 = 120 unit
Time taken by B to complete the work
= $\frac{120}{5}$ = 24 days

Sol.123.(c)



Time taken by A, B and C to complete the work = $\frac{60}{6+4+3} = \frac{60}{13} = 4\frac{8}{13}$days

Sol.124.(c) Total work = LCM (25, 20)
= 100 units
Work done by A in 1 day = 4 units
Work done by B in 1 day = 5 units
Work done together by A and B in 5 days
= 9 × 5 = 45 unit
Work left = 100 - 45 = 55 units
Time taken by B to complete remaining work = $\frac{55}{5}$ = 11 days

Sol.125.(d)
Total work = LCM of 20 and 24 = 120
Efficiency of A = 6 and Efficiency of B = 5
Work completed by both in 10 days
= 11× 10 = 110
Remaining work = 120 - 110 = 10
Time taken by B for the remaining work
= $\frac{10}{5} = 2\ days.$

Sol.126.(d)
A can complete $\frac{2}{5}$of the work in 12 days,
So, A can complete the whole work in
= $\frac{12 \times 5}{2}$ = 30 days
B can complete $\frac{3}{4}$ of the work in 25 days.
So , B can complete the whole work
= $\frac{25 \times 4}{3} = \frac{100}{3}$days
Let the total work = 300 unit
Efficiency of A = $\frac{300}{30}$ = 10
Efficiency of B = $\frac{300 \times 3}{100}$ = 9
(A + B) together can complete the work in $\frac{300}{19}$ days

Sol.127.(a)

	Days	T.W.	Efficiency
Ram →	20		3
		60	
Krishna →	30		2

When they work together, time taken by them = $\frac{total\ work}{efficiency} = \frac{60}{5}$= 12 days

Sol.128.(d) Ratio of the working day of A and B = 12 : 16
Ratio of the efficiency of A and B = 4 : 3
And total work = LCM of 12 & 16 = 48
A and B work together, alternatively and start with A .
2 day's work of A and B =7
12 day's work = 7 × 6 = 42
12 day's work + 1 day work of A = 42 + 4 = 46
Time taken by B to complete remaining work = $\frac{2}{3}$
Total time taken = $13\frac{2}{3}$ days

Sol.129.(d) A → 20 days
B → 30 days
Total work = (LCM of 20 and 30) = 60
The efficiency of A = $\frac{60}{20}$ = 3
The efficiency of B = $\frac{60}{30}$ = 2
A/Q ,
Time taken by A + B → $\frac{60}{5}$ = 12 days

Sol.130.(b)

	A		B
Efficiency→	2	:	1
Time →	1	:	2

Time (A + B) = $\frac{1\times 2}{1+2}=\frac{2}{3}$ ⇒ $20\ days$
If $\frac{2}{3}$ → $20\ days$
1 → $\frac{20\times 3}{2}=30\ days$
A alone can finish the work in 30 days.

Sol.131.(c) A can complete the whole work in = $5\times 8=40\ h$
⇒ B can complete the whole work in = $6\times 10=60h$
⇒ A + B together can complete the same work in = $\frac{40\times 60}{40+60}=\frac{2400}{100}=24\ h$
⇒ In 1 day, work is done for 8 hours
⇒ Number of days = $\frac{24}{8}$ = 3 days

Sol.132.(b) Efficiency = $\frac{work}{Time}$
Efficiency of A = $\frac{0.5\times 4}{3}$ of B's = $\frac{2}{3}$ of B's efficiency

	A		B
Efficiency →	2	:	3
Time →	3	:	2

Total work = 12 × 5 = 60 unit
Time taken by B = $\frac{60}{3}=20$ days

Sol.133.(b)

	A	B	C	A+B	A+B+C
Efficiency →	4	10	7	14	21

Time taken by C to complete the work = 30 days
Total work = $7\times 30=210$
Time taken by (A + B + C) = $\frac{210}{21}$ = $10\ days$

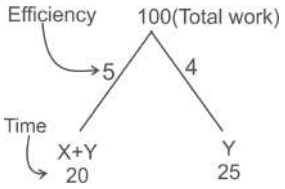
Sol.134.(c)
A can finish a task in 16 days.
B can finish the same task in one fourth the time taken by A.
B can finish a task in 4 days,
A's work in 1 day = $\frac{1}{16}$
B's work in 1day = $\frac{1}{4}$
work in 1 day by A and B= $\frac{1}{16}+\frac{1}{4}=\frac{5}{16}$

Sol.135.(a)

	Men		Days		Work
	45	:	200	:	4.5
	x	:	150	:	7.5

$\Rightarrow \frac{M_1D_1}{W_1}=\frac{M_2D_2}{W_2}$
$\Rightarrow \frac{45\times 200}{4.5}=\frac{x\times 150}{7.5}$
$\Rightarrow 2000=20x \Rightarrow x=100$
Extra employs = 100 - 45 = 55

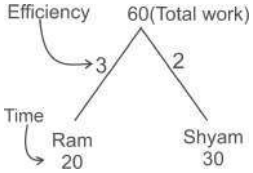
Sol.136.(c)
Let, number of man in the beginning = X
$M_1 \times D_1 = M_2 \times D_2$
⇒ X × 70 = (X + 10) × 60 ⇒ X = 60 men

Sol.137.(c)


Total work = LCM of 20 and 25 = 100 unit
Efficiency of X = 5 - 4 =1
Now ATQ, X alone finishes the task in = $\frac{100}{1}$ = 100 days

Sol.138.(b) A alone can finish the work in 30 days.
So in 6 days, $\frac{1}{5}th$ work can be done
Remaining work = 1 - $\frac{1}{5}=\frac{4}{5}$
$\frac{4}{5}th\ of\ the\ work\ completed\ in\ 24\ days$ by B.
So the whole work can be completed by B in = $\frac{24\times 5}{4}=30\ days$

Time taken by A + B together = $\frac{30\times 30}{30+30}$ = $15\ days$

Sol.139.(d)


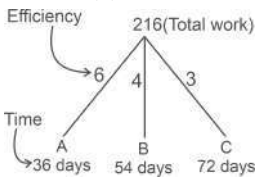
Total efficiency of Ram and shyam together is 5 units .
Total time taken by both
= $\frac{total\ work}{total\ efficiency}=\frac{60}{5}$ = 12 Days
Short Trick:-
Total Time (R + S) = $\frac{a\times b}{a+b}=\frac{20\times 30}{20+30}$
$=\frac{20\times 30}{50}=12\ days$

Sol.140.(a)
Let the efficiency of each 14 people = 1
Total work = 14 × 1 × 12 = 168
A/Q , efficiency of each people of set of 7 people = $\frac{1}{4}$
Efficiency of set of 7 people = $\frac{7}{4}$
Time = $\frac{168}{7}\times 4=24\times 4=96\ days$

Sol.141.(d)
Total work = LCM of (14 , 35 , 6) = 210
Efficiency of Ameesha = $\frac{210}{14}=15$
Efficiency of Bhavya = $\frac{210}{35}=6$
Efficiency of (Ameesha + Bhavya + Chitra) = $\frac{210}{6}=35$
∴ Efficiency of Chitra = 35 - (15 + 6) = 14
Time taken by Chitra = $\frac{210}{14}=15\ days$

Sol.142.(a) Time (Narendra + Amit) = $\frac{10\times 12}{10+12}=\frac{120}{22}=\frac{60}{11}=5\frac{5}{11}$days

Sol.143.(b) Time (Sita + Rita) = $\frac{20\times 30}{20+30}$
= $\frac{20\times 30}{50}=12\ Days$

Sol.144.(a)


In last 8 days only C will work
= $3\times 8=24$
Work done by A and C in 4 days
= $9\times 4=36$
Remaining work = 216 - (24 + 36)

= 216 - 60 = 156

Time (A + B + C) = $\frac{156}{13} = 12$

C worked for = 12 + 12 = 24 days

Sol.145.(a) Work is the same in both conditions . so that

18 skilled worker × 12 days = 24 semi - skilled × 15 days

Ratio of efficiency -

skilled workers : semi - skilled workers

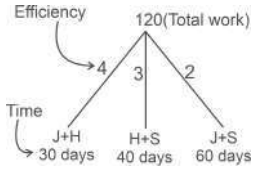
5 : 3

Now , 3 skilled workers = 5 semi skilled workers

Sol.146.(d) Time taken by Ram = $\frac{6 \times 8}{8-6}$

= $\frac{48}{2} = 24\ days$

Sol.147.(d)



Efficiency of Jaya + Hema + sushma

= $\frac{4+3+2}{2} = 4.5$

Time taken by jaya + Hema + Sushma

= $\frac{120}{4.5} = 26\frac{2}{3} days$

Sol.148.(c) K : S

Ratio of the efficiency = 2 : 1

Total work = (2 + 1) × 20 = 60

Karan alone completes the same task = $\frac{60}{2}$ = 30 days

Sol.149.(a) Possible pieces can be made out of this cloth = 5 × 57.6 = 288 pieces

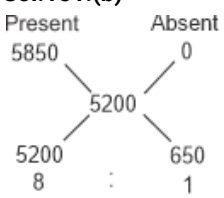
Sol.150.(a)

Days		Efficiency	T/W
X - 15	:	4	
			60
Y - 20	:	3	

efficiency of Z = $\frac{5}{2}$ x 4 = 10

When they work together (X + Y + Z) = $\frac{60}{17} = 3\frac{9}{17}$ days

Sol.151.(b)



Maximum possible daily wage = $\frac{5200}{8} = Rs\ 650$

Shortcut:-

HCF of (5200 and 5850) = 650

Maximum daily wage = Rs 650

Sol.152.(a) In 3 years rakesh donate blood twice so in 6 years he will donate 4 times

Total blood donated = 4 × 330

= 1320 ml = 1.32 liter

Sol.153.(b)

Let , V = vicky and G = Gurpreet

In this question work is the same.

So that.

V × 40 = V × 8 + G × 32

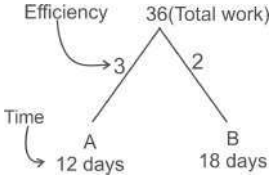
V × 32 = G × 32

Ratio between V and G (Efficiency) = 1 : 1

Then , total work = 40 × v = 40 × 1 = 40

When Vicky and Gurpreet Singh work together = $\frac{40}{2}$ = 20 days

Sol.154.(c)



Work completed in 3 days by (A + B)

= 3 × 5 = 15

Remaining work = 21

Time taken by B to complete the remaining work = $\frac{21}{2} = 10.5\ days$

Sol.155.(c) Time Efficiency T/W

Ist puncture - 9 min : 2

18

2nd puncture - 6 min : 3

When both punctures work together = $\frac{18}{5} = 3\frac{3}{5}$ min

Sol.156.(a)

Total work = LCM of Days (6 , 3 , 4) = 12

A : B : C

Ratio of the efficiency = 2 : 4 : 3

Ratio of the days = 6 : 3 : 4

When C work alone = $\frac{12}{3}$ = 4 unit

= 40 days

Now , when (A + B + C) work together

= $\frac{12}{9}$ unit = $\frac{120}{9} = 13\frac{1}{3}$ days

Sol.157.(b) $\frac{M_1 D_1}{W} = \frac{M_2 D_2}{W}$

$\Rightarrow \frac{100 \times 20}{1} = \frac{125 \times D_2}{1}$

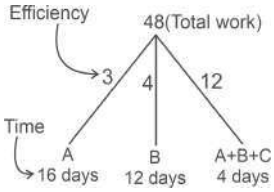
$\Rightarrow D_2 = \frac{100 \times 20}{125} = 16$ days

Sol.158.(b) Man can type 35 words in 1 minutes (60 sec)

987 words = $\frac{60}{35} \times 987 = 1692\ sec$

$= 28\ min\ 12\ sec$

Sol.159.(d)

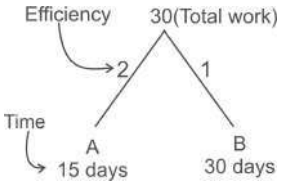


Efficiency of C = 12 - 4 - 3 = 5

Time taken by C to complete the work

= $\frac{48}{5}\ days$

Sol.160.(c)



Efficiency of A + B = 3

In 2 days = 3 unit work is completed

In 20 days = 30 unit work completed

Sol.161.(a)

		Days	T/W	Efficiency
A	→	60		2
B	→	40	120	3
C	→	30		4

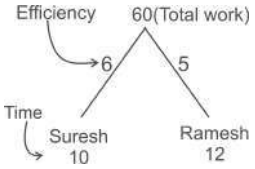
(A + B) work in starting 3 days = 3 × 5 = 15 work

Remaining work = 120 - 15 = 105

Remaining work will be completed by

(A + B + C) = $\frac{105}{9} = 11\frac{2}{3}$ days

Sol.162.(c)



They work together 4 days = 4(6 + 5) = 44

Remaining work = $\frac{16}{60} = \frac{4}{15}$

Sol.163.(b)

W × 6h = (M × 4h) = (B × 8h)

Total work = 24

Ratio of the efficiency (W : M : B)

= 4 : 6 : 3

8 × 8W × 10 = (10W + 10M + 10B) × 8 × ? days

Puting the value of efficiency -

8 × 32 × 10 = (40 + 60 + 30) × 8 × ?

= 2560 = 1040 × ? $\Rightarrow$? = $2\frac{6}{13}$ days

Sol.164.(d) Ratio of time taken between A , B and C = 15 : 5 : 3

Total work = 15(LCM of time)

Efficiency = ($\frac{T}{W}$ ÷ TIME)

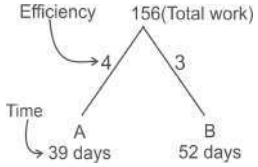
Ratio of the efficiency between A , B and C = 1 : 3 : 5

$\frac{15}{9}$ unit = 5 days

When A work alone ,

$\Rightarrow \frac{15}{1}$ unit = $\frac{5 \times 15 \times 9}{15}$ = 45 days

Sol.165.(b)



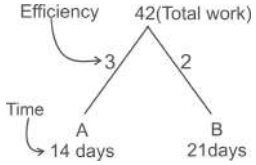
In 3 days B can do = 9 work

Remaining work = 156 - 9 = 147

A and B together complete 147 work

Time (A + B) = $\frac{147}{7} = 21\ days$

Sol.166.(a)



Starting with B they work alternately

In 2 days = 5 work

In 16 days = 40 work

In next day B work

In 17 days = 42 work completed.

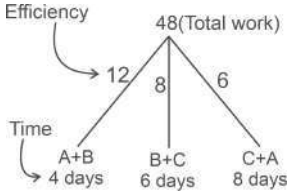
Sol.167.(d)

$\frac{M_1 D_1 H_1}{W_1} = \frac{M_2 D_2 H_2}{W_2}$

$\Rightarrow \frac{24 \times 15 \times 8}{1} = \frac{M_2 \times 10 \times 6}{1}$

$\Rightarrow M_2 = 48$

Sol.168.(b)



Efficiency of A + B + C = $\frac{26}{2} = 13$

Efficiency of C = 13 - 12 = 1

Time to complete the work by C alone

= $\frac{48}{1} = 48\ hours$

Sol.169.(d)

Total work = LCM of (12 , 15 , 5) = 60

Efficiency of A = 5

Efficiency of B = 4

Efficiency of (A + B + C) = 12

Efficiency of C = 12 - 5 - 4 = 3

Ratio of efficiencies of A , B, and C

= 5 : 4 : 3

12 unit = Rs. 2880

Share of C = 3 unit = $\frac{2880}{12} \times 3 = Rs\ 720$

Sol.170.(c)

	Days	T/W	Efficiency
(A + B) -	12	36	3
(B + C) -	18		2

A/Q Ratio of the efficiency (A : B : C)

= 1.5 : 1.5 : 0.5

When B, work alone = $\frac{36}{1.5}$ = 24 days

Sol.171.(d)

(M + B) × 24 = (M + B) × 20 + M × 6

2M = 4B

M : B = 2 : 1

Total work = (2 + 1) × 24 = 72 unit

Time taken by boy alone = $\frac{72}{1}$ = 72 days

Sol.172.(c) A : B

Efficiency→ 5 : 7

Given that A can complete the work in 18days , so total work is 90.

Now B will do the work in = $\frac{90}{7}$

= $12\frac{6}{7}$ days .

Sol.173.(b) Let the efficiency of A = 4

Efficiency of B = 4 + 3 = 7

Total work done by A = 20 × 4 = 80

Time of B $= \frac{80}{7} = 11\frac{3}{7} days$

Sol.174.(b)

Let the efficiency of Each man = M

And Efficiency of Each boy = B

A/Q ,

(2M + 3B) × $18 = (3M + 2B) \times 15$

⇒ 36M + 54B = 45M + 30B ⇒ 24B = 9M

$\Rightarrow \frac{B}{M} = \frac{9}{24} = \frac{3}{8}$

Total work = $(2 \times 8 + 3 \times 3) \times 18 = 450$

Efficiency of 4M + 2B = 4 × 8 + 2 × 3 = 38

Time = $\frac{450}{38} = 11\frac{16}{19}\ days$

Sol.175.(a)

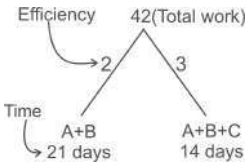
Ratio of efficiency of A and B = 3 : 1

Total work = 18 × (3 + 1) = 72

Time to complete the work by A alone

= $\frac{72}{3}$ = 24 days

Sol.176.(c)



Efficiency of C = efficiency of (A + B + C) - efficiency of (A + B) = 1

When C work Alone = $\frac{42}{1}$ = 42 Days

Sol.177.(a)

Total work = LCM of (11, 15, 13) = 2145

Efficiency of Imran = 195

Efficiency of Tahir = 143

Efficiency of Amla = 165

Total efficiency = 195 + 143 + 165 = 503

503 unit = 2012

Share of Imran = 195 =

$\frac{2012}{503} \times 195 = Rs\ 780$

Sol.178.(d)

	Days	T/W	Efficiency
(Ramu + Rohit + Shyam)--	8	48	6
Ramu --	16		3
Rohit --	24		2

Efficiency of the shyam = 6 - (5) = 1

When shyam working alone = T/W ÷ efficiency of the shyam = 48 ÷ 1 = 48

Sol.179.(d) Ratio of the efficiency between raju and ravi = 3 : 1

Ratio of the time between raju and ravi = 1 : 3

Total work = LCM of time = 3 unit

Given ,difference between days = 2 unit = 20 days

When ravi complete the total work alone = 30 days

Sol.180.(d)

Total work = LCM of (10, 12, 15) = 60

Efficiency of (Ramu + Somu) = 6

Efficiency of (Somu + Dhamu) = 5

Efficiency of (Dhamu + Ramu) = 4

Efficiency of (Ramu + Dhamu + Somu)

= $\frac{15}{2}$

Time (Ramu + Dhamu + Somu) = $\frac{60 \times 2}{15}$

$= 8\ days$

Sol.181.(a)

Girl alone can do a work in 6 days And girl and her friend together can complete same work in 4 days

Time to complete by her friend alone

= $\frac{6 \times 4}{6 - 4} = \frac{24}{2} = 12\ days$

Sol.182.(c) According to the question :

Rama can finish a piece of work in 50 days but he worked for 10 days and the remaining work was finished by Ravi in 32 days.

So , 40 days of Ram's work = 32 days of Ravi's work

$\frac{Efficiency\ of\ Ram}{Efficiency\ of\ Ravi}$ = $\frac{4}{5}$

Total work = Efficiency of Ram × days taken by Ram

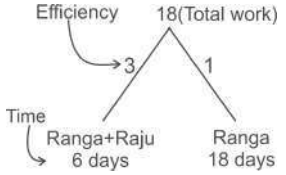
= 4 × 50 = 200

Ram and Ravi, working together, will finish the same work in = $\frac{200}{4+5}$ = $\frac{200}{9}$

= $22\frac{2}{9}$ days.

Sol.183 (c) As the total work is same
M × 20 = N × 30
$\frac{M}{N} = \frac{3}{2}$
Total work = 3 × 20 = 60
Time taken by M and N to complete the work = $\frac{60}{3+2}$ = 12

Sol.184.(d)



Total work = LCM of the days = 18
Efficiency of raju = 3 - 1 = 2
When raju work alone = $\frac{18}{2}$ = 9 days

Alternate Method :
Days taken by raju = $\frac{a*b}{a-b}$
= $\frac{18*6}{18-6}$ = 9 days

Sol.185.(d)
Time (Manvi + Darshan) = 40 days
In 40 days they can complete the whole work
So, In 25 days, work done = $\frac{25}{40} = \frac{5}{8}$
Remaining work = 1 - $\frac{5}{8} = \frac{3}{8}$
For $\frac{3}{8}$ work Manvi takes 24 days to complete
For 1 work = $\frac{24 \times 8}{3} = 64\ days$

Sol.186.(d) 21W × 40 = 30M × 21
$\frac{W}{M} = \frac{30 \times 21}{40 \times 21} = \frac{3}{4}$
M : W = 4 : 3

Sol.187.(d)
Total work = LCM of (20 and 15) = 60
Efficiency of A = 3
Efficiency of B = 4
Work completed by A and B in 5 days
= (3 + 4) × 5 = 35
Remaining work = 60 - 35 = 25
Remaining work completed by C in 2 days
Efficiency of C = $\frac{25}{2} = 12.5$
Share of C = $\frac{2400}{60} \times 2 \times 12.5 = Rs\ 1000$
Daily wages of C = $\frac{1000}{2}$ = Rs 500
Share of A = $\frac{2400}{60} \times 5 \times 3 = Rs\ 600$
Daily wages of A = $\frac{600}{5} = Rs\ 120$
Difference in daily wages of C and A
= 500 - 120 = Rs 380

Sol.188.(d)
Total work = LCM of (6 , 4 , 10) = 60
Efficiency of A = 10
Efficiency of B = 15
Efficiency of C = 6
Efficiency of (A + B + C) = 31
Time (A + B + C) = $\frac{60}{31} = 1\frac{29}{31}\ days$
Alternate method
$\frac{1}{total\ days} = \frac{1}{6} + \frac{1}{4} + \frac{1}{10} = \frac{31}{60}$
Total days in which all will complete the work = $\frac{60}{31} = 1\frac{29}{31}$

Sol.189.(b)
Rama × 50 = Rama × 10 + (Ravi × 32)
Rama × 40 = Ravi × 32
$\frac{Rama}{Ravi} : \frac{32}{40}$
Ratio of the efficiency between Rama and Ravi = 4 : 5
Total work = Rama × 50 = 4 × 50 = 200
When Rama and Ravi work together
= $\frac{20.0}{9}$ = $22\frac{2}{9}$days

Sol.190.(c)
Total work = LCM of (18, 24, 36) = 72
Efficiency of (A + B) = 4
Efficiency of (B + C) = 3
Efficiency of (A + C) = 2
Efficiency of (A + B + C) = 4.5
Efficiency of A = 4.5 - 3 = 1.5
Time (A) = $\frac{72}{1.5} = 48\ days$
Efficiency of B = 4.5 - 2 = 2.5
Time (B) = $\frac{72}{2.5} = 28\frac{4}{5} days$
Efficiency of C = 4.5 - 4 = 0.5
Time (C) = $\frac{72}{0.5} = 144\ days$

Sol.191.(a)

	Days	T/W	Efficiency
A →	56	280	5
B →	70		4

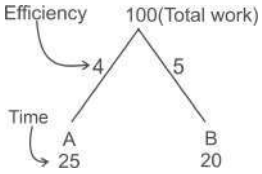
A/Q , B finished the remaining work in 34 days = 4 × 34 = 136 work
In starting A and B work together = $\frac{280-136}{efficiency\ of(A+B)} = \frac{144}{9}$ = 16 days
16 days worked by A.

Sol.192.(a) Time (A + B) = 36 days
In 36 days (A + B) can complete the whole work.
In 30 days (A + B) can complete = $\frac{30}{36}$
= $\frac{5}{6}$th of work
Remaining work = 1 - $\frac{5}{6} = \frac{1}{6}$
A can complete $\frac{1}{6}th$ work in 10 days
A can complete whole work
= 10 × 6 = 60 days

Sol.193.(a)
Ratio of the efficiency A and B = 2 : 1
Total work = 10 × 3 = 30
When A work alone = $\frac{30}{2}$ = 15 days

Sol.194.(d) Ratio of efficiency of man and boy = 7 : 5
Time (M + B) = 60 days
Total work = 60 × 12 = 720
Time (boy) = $\frac{720}{5} = 144\ days$

Sol.195.(b)



Work done by (A + B) in 5 days = (4 + 5) × 5 = 45
Remaining work = 100 - 45 = 55
B finished 55 work alone in = $\frac{55}{5}$
= 11 days

Sol.196.(a)
Let the original number of men = x
5 are absent so remaining men = x - 5
$\Rightarrow \frac{M_1 D_1}{W_1} = \frac{M_2 D_2}{W_2}$
$\Rightarrow \frac{x \times 10}{1} = \frac{(x-5) \times 12}{1}$
$\Rightarrow 10x = 12x - 60$
$\Rightarrow 2x = 60 \Rightarrow x = 30$

Sol.197.(a) Without overhauling case : 4 service in 360 days
Total time = $\frac{5 \times 4}{6} = \frac{10}{3}$
With overhauling case : 3 service in 360 days
Total time = $\frac{5 \times 3}{6} = \frac{5}{2}$
Time saved = $\frac{\frac{10}{3} - \frac{5}{2}}{\frac{10}{3}} = \frac{1}{4}$

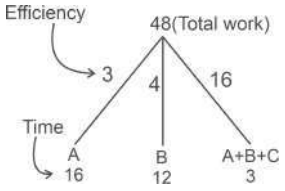
Sol.198.(c) Efficiency of A : B = 3 : 2
Efficiency of B : C = 5 : 4
Efficiency of A : B : C = 15 : 10 : 8
Total work = 22 × 15 = 330
A,B and C together complete the task
= $\frac{330}{15+10+8}$ = 10 days

Sol.199.(b) A/Q ,
25 × 60 = (25 × x) + 30 × (55 - x)
$\Rightarrow$ 1500 = 25x + 1650 - 30x
5x = 1650 - 1500

$5x = 150 \Rightarrow x = 30$

Sol.200.(c) Total work = LCM of 14 and 42 = 42
Efficiency of (A + B + C) = 3
Efficiency of C = 1
Efficiency of (A + B) = 3 - 1= 2
Time (A + B) = $\frac{42}{2} = 21\ days$

Sol.201.(d)



Efficiency of C = 16 - (3 + 4) = 9
When C works alone = $\frac{48}{9} = 5\frac{1}{3}$

Sol.202.(d) P can complete task in = $10 \times 6 = 60\ hours$
Q can complete in = $9 \times 10 = 90\ hours$
Time (P + Q) = $\frac{60 \times 90}{60 + 90} = \frac{60 \times 90}{150}$
$= 36\ hours$
Both P and Q working 6 hours a day
Number of days = $\frac{36}{6} = 6\ days$

Sol.203.(a) Let the one day work of A = a , B = b and C = c
Total Work = 2(a + b + c) + 9(b + c) + 6c
= 16a + 16b + 16c = 24c
⇒ 2(a + b + c) + 9(b + c) + 6c
= 16a + 16b + 16c
⇒ 2a + 11b + 17c = 16a + 16b + 16c
c = 14a + 5b ….(1)
⇒ 16a + 16b + 16c = 24c
2a + 2b = c…..(2)
comparing eq 1 and eq 2
14a + 5b = 2a + 2b
12a = - 3b ⇒ b = - 4a
putting value of b in eq (1)
c = 14a + 5(- 4a) ⇒ c = - 6a
Total work = 16a + 16b + 16c
= 16a - 64a - 96a = - 144a
total work done by B alone = $\frac{-144a}{-4a}$
= 36 days

Sol.204.(b)
Total work = LCM of (30 , 40, 60) = 120
Efficiency of A + B = 4
Efficiency of B + C = 3
Efficiency of A + C = 2
Efficiency of A + B + C = $\frac{9}{2}$
Time (A + B + C) = $\frac{120}{9} \times 2$
$= 26\frac{2}{3}\ days$

Sol.205.(b) Trick:
They take time to complete the work together = $\sqrt{12 \times 27}$ = 18 hrs.

Sol.206.(c) A and B together can finish a task in 24 days
So, In 18 days A and B can complete $\frac{3}{4}$ $th\ work$
Remaining work = 1 - $\frac{3}{4} = \frac{1}{4}$
$\frac{1}{4}th$ work completed by C in 10 days
C can complete the whole work in 40 days
Time (A + B + C) = $\frac{24 \times 40}{24 + 40} = \frac{24 \times 40}{64}$
$= 15\ days$

Sol.207.(a) Total work = 15 unit
Efficiency of kiran = 1
Work left = 15 - 5 = 10 unit
Venkat complete 10 unit work = 30 days
Venkat will complete the whole work alone = $\frac{30}{10} \times 15$ = 45 days

Sol.208.(c)
A can finish the work in 20 days
B can do the same work in 10 days
Time (A + B) = $\frac{20 \times 10}{30} = \frac{20}{3}\ days$
In 1 day (A + B) can do = $\frac{3}{20}\ part\ of\ work$

Sol.209.(b)

	Days	T/W	efficiency
Ram →	12		3
		36	
Shyam →	18		2

5 unit = 15000 Rs
3 unit = 9000 Rs (Ram)
2 unit = 6000 Rs (Shyam)

Sol.210.(d)

	days	T/W	efficiency
(A + B) →	10		7
		70	
C →	14		5

Total work = LCM of the days = 70
Efficiency of (A + B + C) = 12
three - fifth of the same work = $\frac{3}{5} \times 70$
= 42
Hence , three - fifth of total work is finished by (A + B + C)
= $\frac{42}{12} = \frac{7}{2}$ days

Sol.211.(b)
Ratio of efficiency of Anil and Behu = 2 : 1
Total work = 12 × (2 + 1) = 36
Time taken by Anil to complete to the work = $\frac{36}{2}$ = 18

Sol.212.(b) Let the efficiency of Man = M
Efficiency of women = W
Now ,
$14M \times 9 = 16W \times 7$
$\Rightarrow 9M = 8W \Rightarrow \frac{M}{W} = \frac{8}{9}$
Total work = $14 \times 8 \times 9 = 1008$
Efficiency of (6 men + 8 women) =
$6 \times 8 + 8 \times 9 = 48 + 72 = 120$
Time (6men + 8women) = $\frac{1008}{120}$
= 8.4 days

Sol.213.(c) As we know :
$\frac{M_1 D_1}{W_1} = \frac{M_2 D_2}{W_2}$
Here a certain number of men (let it be = M) can complete a task in 50 days.
If there are 5 men more, then it can be finished in 10 days less.
$\Rightarrow 50M = 40(M + 5) \Rightarrow M = 20$
So, here there were 20 men initially.

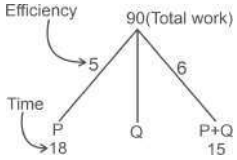
Sol.214.(b) A can complete $\frac{1}{3}$ of a piece of work in 5 days.
So A can complete the whole work in 15 days.
B can do $\frac{2}{5}$ of the work in 10 days.
So B can do the the whole work in
= $\frac{10 \times 5}{2} = 25$days
Time taken by A + B = $\frac{15 \times 25}{40} = \frac{75}{8}$
= $9\frac{3}{8}$days

Sol.215.(d)
Total work = LCM of (30 , 40 , 60) = 120
Efficiency of Ram and Shyam = 4
Efficiency of Shaym and Bharti = 3
Efficiency of Bharti and Ram = 2
Efficiency of 2(Ram + Shyam + Bharti) = 9
(Ram + Shyam + Bharti) = $\frac{9}{2}$
When they work together, time taken
= 120 ÷ $\frac{9}{2}$ = $26\frac{2}{3}$days

Sol.216.(b) Let the corn last in x days.
$\frac{M1 \times D1}{W1} = \frac{M2 \times D2}{W2}$
A/Q , $\frac{42 \times 27}{270} = \frac{21 \times x}{300}$
$\Rightarrow x = \frac{42 \times 27}{270} \times \frac{300}{21} \Rightarrow x = 60$

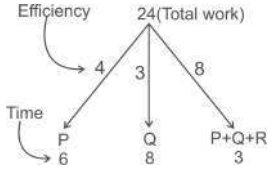
Hence, the corn will last in 60 days.

Sol.217.(c)



Efficiency of Q = 6 - 5 = 1
Q left the work after 10 days,
Workdone by (P + Q) in 10 days → 10 × 6 = 60
Remaining work → 90 - 60 = 30
Time taken by P to complete the remaining work → $\frac{30}{5}$ = 6 days.

Sol.218.(c)



Efficiency (R) = 8 - (4 + 3) = 1
Wages of R = $\frac{1}{8} \times 3200 = Rs.400$

Sol.219.(d)
Let the food supply last for x days.
A/Q , $250 \times 30 = (250 - 50) \times x$
$\Rightarrow 7500 = 200x \Rightarrow x = 37.5$ days
Now, extra days → 37.5 - 30 = 7.5 days

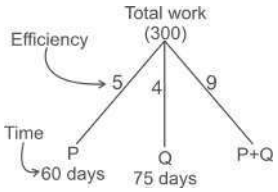
Sol.220.(c) Time taken by P = 15 days , Q = 20 days and R = 30 days
Hence Total Work = LCM of P, Q and R
Total Work = 60
So efficiency of P = 4, Q = 3 and R = 2
Hence P and Q is the best choice for doing work.

Sol.221.(a) 20W × 16 Days = 16M × 15
$\frac{W}{M} = \frac{3}{4}$ So, ratio of M : W = 4 : 3

Sol.222.(d) Let ,total work is 100 %
ATQ ,
P + Q = 70%, Q + R = 50%
Work done by $(P + Q + R + Q)$
$= (70\% + 50\%) = 120\%$
Work done by Q = $(120\% - 100\%)$
= 20%
Work done by P = (70% - 20%) = 50%
Work done by R = (50% - 20%) = 30%
P works the most from all three in given time so efficiency of P will be greater than Q and R
So , P will finish the work first

Sol.223.(a) Let the efficiency of men and boys be M and B respectively
According to question ,
(9M + 12B) × 4 = (4M + 16B) × 6
→ 12M = 48B → $\frac{M}{B} = \frac{4}{1}$
Total work→ (9M + 12B) × 4
= (9 × 4 + 12 × 1) × 4 = 192 unit
Then, 6 men and 24 boys can do this work in→ $\frac{192}{(6 \times 4 + 24 \times 1)}$ = 4 days

Sol.224.(c)



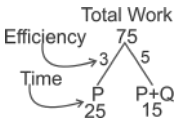
Work done by Q in 30 days→ 30 × 4
= 120 units
Remaining work = $300 - 120$
= 180 units
Time taken by (P + Q) to complete the 180 units work → $\frac{180}{5+4}$ = 20 days
So P left after 20 days.

Sol.225.(c) According to question ,
Let the efficiency of P is (P) and the efficiency of Q is (Q).
P alone complete a work = 12 × 8 × P
Q alone complete same work = 10 × 12 × Q
12 × 8 × P = 10 × 12 × Q
$\frac{P}{Q} = \frac{5}{4}$,
Total work = 12 × 8 × 5
Time taken to complete the work together
= $\frac{12 \times 8 \times 5}{9 \times 8} = \frac{20}{3} = 6\frac{2}{3}$ days

Sol.226.(d) According to question,
Remaining work $(1 - \frac{2}{3}) = \frac{1}{3}$ will be complete in remaining days $(124 - 64)$
= 60 days
$\frac{M_1 \times D_1}{W_1} = \frac{M_2 \times D_2}{W_2}$
$\frac{120 \times 64}{\frac{2}{3}} = \frac{M_2 \times 60}{\frac{1}{3}} = \frac{120 \times 64 \times 3}{2}$
$= \frac{M_2 \times 60 \times 3}{1} \Rightarrow M_2 = 64$
So, men will be removed = $(120 - 64) = 56$

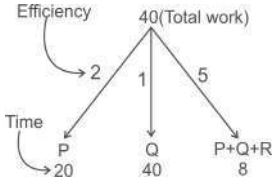
Sol.227.(d) Wages are distributed into their respective efficiency 3 : 1 .
Total work done = 2 × 4 = 8 unit
Time taken by Q to complete the work
= $\frac{8}{1}$ = 8 days

Sol.228.(d) We have given ,
$\frac{80}{100}$P → $20 \Rightarrow P = \frac{20 \times 100}{80} \Rightarrow$ P = 25
$= \frac{20}{100} \times (P + Q) \rightarrow 3 \Rightarrow$ (P + Q)
$= \frac{3 \times 100}{20} \Rightarrow$ (P + Q) = 15



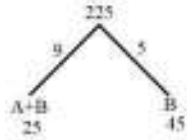
Q's efficiency = [(P + Q) - P] = 5 - 3 = 2
Q will finish the work alone in = $\frac{75}{2}$
= 37.5 days

Sol.229.(b)



According to the question ,
850 rs. Will be paid between P,Q and R
P is twice as fast as Q
Therefore, P finished the work in 20 days.
→Ratio of efficiency of P , Q , R = 2 : 1 : 2
so , R will be paid
→ $\frac{Efficiency\ of\ R}{Total\ efficiency\ of\ (P+Q+R)}$ × 850
$\Rightarrow \frac{2}{5} \times 850 \Rightarrow$ 340Rs.

Sol.230.(a) $33\frac{1}{3}\% = \frac{1}{3}$
1 unit work is done by B in 15 days
3 unit work is done by B in 3×15= 45 days

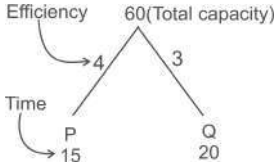


Total work = 225 unit
Efficiency of A+B = 9 unit
Efficiency of B = 5 unit
Efficiency of A = 9-5 = 4 unit
$\frac{4}{15}$th of the task will be completed by A
= $\frac{225 \times 4}{4 \times 15}$= 15 unit

Sol.231.(c) According to question
$x \times \frac{1}{6} = \frac{y}{2} \Rightarrow \frac{x}{y} = \frac{3}{1}$
Total work = (3 + 1) × 10 = 40
So, required number of days to complete the work by y alone = 40 days

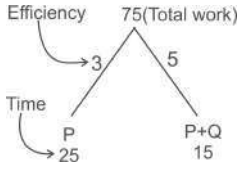
Sol.232.(c)
The efficiency of man : boy be → 3 : 1
A.T.Q . , 3 unit → 525
Therefore, boy get for his work per day be(1 unit) → $\frac{525}{3}$ = 175

Sol.233.(d)



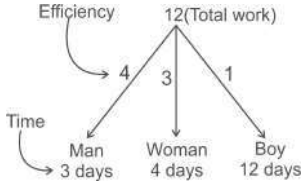
Let , total capacity of the tank be 60 units.
Tank filled by pipe P and Q in 4 min.
⇒ 7 × 4 = 28 units
Then, time taken by Q to filled the remaining tank ⇒ $\frac{60-28}{3} = \frac{32}{3}$
= 10 min 40 sec
Total time = 4 min + 10 min 40 sec. = 14 minute 40 seconds

Sol.234.(c)



Total time taken by P to complete whole work = 25 days
Time taken by (P + Q) = 15 days
Work = time × efficiency
Ratio of efficiency → P : Q = **3 : 2**

Sol.235.(c)

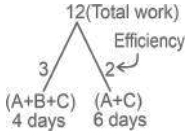


Let x boys employed to help 3man and 4woman
Because of work should be finished in $\frac{1}{4}$ th of a day
Efficiency ∝ $\frac{1}{time}$
⇒ 3M + 4W + x B = (12 × 4)
(3 × 4) + (4 × 3) + x × 1= 48
⇒ x = 24 boys

Sol.236.(c) A can complete the whole work in 12 days.
and B can do the whole work in 36 days.

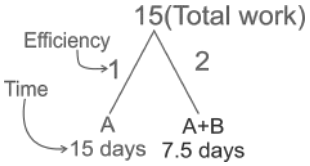
Total time taken to complete the whole work by A and B together →
→ $\frac{36}{3+1} = 9\ days.$

Sol.237.(d)



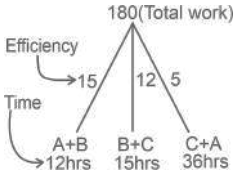
It is given that after starting the work B left , that means B did 0 units of work
Now, efficiency of B = 3−2 = 1 unit
So, time taken by B to complete the work
→ $\frac{12}{1}$ = 12 days.

Sol.238.(c)



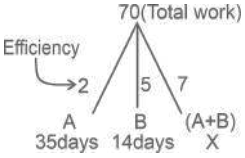
Then efficiency of B = 1
Total time taken by B = $\frac{15}{1}$ = 15 days.

Sol.239.(b)



2(A + B + C) = 32 ⇒ A + B + C = 16
So, all three together complete the same work in ⇒ $\frac{180}{16}$ = 11.25 days

Sol.240.(d)



(A + B) worked for 5 days only.
Left fraction of work → $\frac{70-(7\times5)}{70} = \frac{1}{2}$

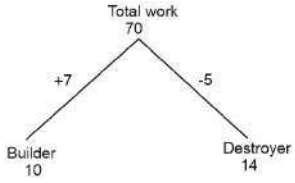
Sol.241.(b) A.T.Q .,
Ratio of efficiency → L : M = 3 : 1
Total work = 12 × 4 = 48 units
Time taken by L alone to finish the same work = $\frac{48}{3}$ = 16 days

Sol.242.(d) We know that , salary is divide according to their efficiency.
Ratio of efficiency ⇒ B : C
⇒ 2 : 1
Ratio of efficiency ⇒ A : B
⇒ 3 : 1
Equating the ratio ⇒ A : B : C
⇒ 6 : 2 : 1
⇒ 9 units = 94842 Rs.
⇒ 1 unit = 10538 Rs.
⇒ 6 units = 63228 Rs.

Sol.243.(b) We know that , salary is ; divide according to their efficiency.
Ratio of efficiency
⇒ B : C ⇒ 2 : 1
Ratio of efficiency
⇒ A : B ⇒ 3 : 1
Equating the ratio
⇒ A : B : C ⇒ 6 : 2 : 1
⇒ 9 units = 94248 Rs.
⇒ 1 unit = 10472 Rs.
⇒ 6 units = 62832 Rs.

Sol.244.(b) Total work = 360 unit
Let the efficiency of Sharan and Mayukh be x and y respectively
Efficiency of Sharan and Mayukh i.e.
(x + y) = $\frac{360}{18}$ = 20 unit
Time taken by Mayukh to complete $\frac{1}{3}$ of the task = $\frac{360\times\frac{1}{3}}{y} = \frac{120}{y}$ days
Time taken by Sharan to complete the remaining work = $\frac{240}{x}$ days
ATQ ,
$\frac{120}{y} + \frac{240}{x} = 40 \Rightarrow 120\left(\frac{1}{y} + \frac{2}{x}\right) = 40$
$\Rightarrow \left(\frac{1}{20-x} + \frac{2}{x}\right) = \frac{1}{3}$
$\Rightarrow \frac{x+40-2x}{x(20-x)} = \frac{1}{3} \Rightarrow \frac{40-x}{20x-x^2} = \frac{1}{3}$
⇒ 120 - 3x = 20x - x^2 ⇒ x^2 - 23x + 120 = 0
⇒ x^2 - 15x - 8x + 120 = 0
⇒ x (x - 15) - 8(x - 15) = 0
⇒ (x - 15) (x - 8) = 0
x = 8 (Mayukh had worked faster than Sharan)
So, Time taken by Sharan alone to complete the whole work = $\frac{360}{8}$= 45 days

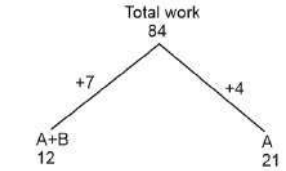
Sol.245.(d)



Efficiency of both of them = 7 - 5 = 2 unit
Work done by both in 7 hrs = 2 × 7 = 14 unit
Remaining work = 70 - 14 = 56 unit which is completed by builder
Required time = $\frac{56}{7}$ = 8 hrs
So, total time required = 8 + 7 = 15 hrs

Sol.246.(d) Efficiency ∝ $\frac{1}{time}$
Surya : Ramya
Efficiency → 3 : 1
Time → 1 : 3
Here, 2 unit i.e. (3 - 1) = 40 days
Then, 1 unit = $\frac{40}{2}$ = 20 days
Total work = 20 × 3 = 60 unit
Time taken by Surya and Ramya to complete the whole work = $\frac{60}{3+1} = \frac{60}{4}$
= 15 days

Sol.247.(a)



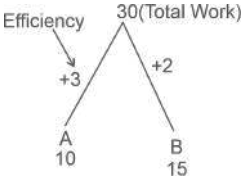
Efficiency of B = eff (A+B) - eff(A) = 7 - 4 = 3 unit
Work done by B in 16 days = 16 × 3 = 48 unit(As B works till the whole work is completed)
Remaining work = 84 - 48 = 36 unit which is completed by A in $\frac{36}{4}$ = 9days
Hence, A left 7 days i.e.(16 - 9) before the completion of work.

Sol.248.(b)
Let A and B take 'A' and 'B'days respectively to complete the work.
(A+B)'s 1 day's work = $\frac{1}{12}$
$\Rightarrow \frac{1}{A} + \frac{1}{B} = \frac{1}{12}$
$\Rightarrow \frac{A}{2} + \frac{B}{2} = 25 \Rightarrow$ A + B = 50
Now , $\frac{1}{A} + \frac{1}{50-A} = \frac{1}{12}$
$\Rightarrow \frac{50-A+A}{50A-A^2} = \frac{1}{12}$
$\Rightarrow A^2$ - 50A = -50 × 12
$\Rightarrow A^2$ - 50A + 600 = 0
$\Rightarrow A^2$ - 20A - 30A + 600 = 0
$\Rightarrow$ A(A - 20) - 30(A - 20) = 0
$\Rightarrow$ (A - 30) (A - 20) = 0 $\Rightarrow$ A = 30 or 20
Since, B is more efficient than A implies that B takes less time than that of A to complete the work. So, the time taken by B = 20 days

Sol.249.(c) Arranging the given expression in sequential order , we get :
$\frac{M_1 \times D_1 \times H_1}{W_1} = \frac{M_2 \times D_2 \times H_2}{W_2}$
$\Rightarrow \frac{30 \times 16 \times 8}{X} = \frac{M_2 \times 12 \times 10}{2x}$
$\Rightarrow M_2 = \frac{30 \times 16 \times 8 \times 2x}{x \times 12 \times 10} \Rightarrow M_2 = 64$
So, the correct option is (c)

Sol.250.(d) Let the required no of men be x
ATQ,
$\Rightarrow \frac{16 \times 8 \times 12}{1} = \frac{x \times 24 \times 8}{3}$
$\Rightarrow 1536 = 64x \Rightarrow x = \frac{1536}{64} = 24$

Sol.251.(d)



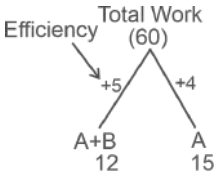
Work done by B for 5 days = 2 × 5 = 10 unit
Remaining work = 30 - 10 = 20 unit
Time taken by both of them to complete the remaining work = $\frac{20}{3+2} = \frac{20}{5}$
= 4 days
So, A and B work for 4 days and 9 days respectively
Since, the wages are distributed in the ratio of the amount of work done
So, the share of A = $\frac{3 \times 4}{30}$ × 60 = ₹24
and the share of B = $\frac{2 \times 9}{30}$ × 60 = ₹36

Sol.252.(c)
The ratio of the efficiency of A, B and C = 2 : 1 : 1
Total work = (2 + 1 + 1) × 30 = 4 × 30
= 120 unit
Time taken by A to complete the whole work = $\frac{120}{2}$ = 60 days
Time taken by B and C alone to complete the whole work = $\frac{120}{1}$ = 120 days

Sol.253.(d)
Let the required no of days be x
ATQ, 4 × 6 × 21 = 7 × 4 × x
$\Rightarrow$ 504 = 28x $\Rightarrow$ x = $\frac{504}{28}$ = 18 days

Sol.254.(d) Let the total work be 35 unit
Then, the efficiency of
(A + B) = $\frac{35}{35}$ = 1 unit
$\Rightarrow$ A + B = 1 $\Rightarrow$ B = A -1
Work done by A alone to complete $\frac{5}{7}$th part of the task = $\frac{5}{7}$ × 35 = 25 unit
Work done by B alone to complete $\frac{2}{7}$th part of the same task = $\frac{2}{7}$ × 35 = 10 unit
ATQ, $\frac{25}{A} + \frac{10}{B} = 90 \Rightarrow \frac{25B + 10A}{AB} = 90$
$\Rightarrow$ 25B + 10A = 90AB $\Rightarrow$ 5B + 2A = 18AB
$\Rightarrow$ 5(1-A) + 2A = 18A(1-A)
$\Rightarrow$ 5 - 5A + 2A = 18A - 18A^2
$\Rightarrow$ 5 - 3A = 18A - 18A^2
$\Rightarrow$ 18A^2 - 21A + 5 = 0
$\Rightarrow$ 18A^2 - 15A - 6A + 5 = 0
$\Rightarrow$ 3A(6A - 5) - 1(6A - 5) = 0
$\Rightarrow$ (3A - 1)(6A - 5) = 0 $\Rightarrow$ A = $\frac{1}{3}$ or $\frac{5}{6}$
$\Rightarrow$ A = $\frac{5}{6}$ (As, A is more efficient than B)
So, the time taken by A alone to complete the whole work = $\frac{35}{\frac{5}{6}}$
= 35 × $\frac{6}{5}$ = 42 days

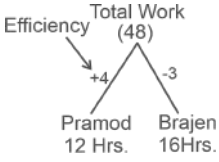
Sol.255.(d)



Efficiency of B = 5 - 4 = 1 unit
Let the total work done in X days
4(x- 10) + x = 60 $\Rightarrow$ 4x - 40 + x = 60
So, x = 20 days
Now , they work together = 20 - 10
= 10 days

Sol.256.(a) Let the total work be 18 unit and also the efficiency of Mugdha and Mayuri be x and y respectively
Then, x + y = $\frac{18}{18}$ = 1
Now, work done by Mayuri alone to complete $\frac{2}{5}$ th of the task
= 18 × $\frac{2}{5}$ = $\frac{36}{5}$ unit
and work done by Mugdha alone to complete $\frac{3}{5}$th of the task
= 18 × $\frac{3}{5}$ = $\frac{54}{5}$ unit
ATQ, $\frac{36}{5y} + \frac{54}{5x} = 39 \Rightarrow \frac{36x + 54y}{5yx} = 39$
$\Rightarrow$ 36x + 54y = 195xy $\Rightarrow$12x + 18y = 65xy
$\Rightarrow$ 12x + 18(1− x) = 65x(1 − x)
$\Rightarrow$ 12x + 18 − 18x = 65x − 65x^2
$\Rightarrow$ 18 − 6x = 65x − 65x^2
$\Rightarrow$ 65x^2 - 71x + 18 = 0
$\Rightarrow$ 65x^2 - 26x - 45x + 18 = 0
$\Rightarrow$ 13 x (5x - 2) - 9 (5x - 2) = 0
$\Rightarrow$ (13x - 9) (5x - 2) = 0 $\Rightarrow$ x = $\frac{9}{13}$ or $\frac{2}{5}$
$\Rightarrow$ x = $\frac{2}{5}$(as Mugdha is less efficient than Mayuri)
So, the time taken by Mugdha to complete the whole work
= 18 × $\frac{5}{2}$ = 45 days

Sol.257.(c)



If they work alternately,
They can paint only (4 - 3) units = 1 unit in 2 hours.
Then, (48 - 4) units = 44 units of work will be done by them = 2 × 44 = 88 hrs.
Now, the remaining 4 units of work will be done by Pramod in 1 hour.
Time taken by them to paint the entire wall red = 88 + 1 = 89 hours.

Pipe and Cistern

Pipes and Cisterns are just an application of Time and Work. Concept wise, it is one and the same. In the above proportionality, Efficiency is replaced by Rate of filling. The equation in this case becomes

$$\text{Rate of filling} \propto \frac{1}{time\ taken}$$

The concept of the percentage of work done can be used to solve most of the related questions.

A few basic points one needs to know to use the percentage concept are: When it is said that someone has done a work, it means he has done 100 % of the work. Hence, if A finishes work in 4 days, it means- in 4 days he will do 100% of the work. Hence, in one day he finishes 25% (100/4) of the work. Similarly, in 3 days he finishes 75 % of the work.

The complete work can also be considered as 1 unit. Then if A takes 4 days to finish a work, it means he can finish 1/4th of the work in 1 day.

Illustrations:

Here are some basic questions to illustrate time and work shortcut tricks.

Efficiency and Time taken are inversely proportional implies that If A is twice as good as B then A will take half the Time that B will take.

If the efficiencies are in the ratio m: n then Time taken will be in the ratio, n: m. i.e. If A is thrice as good as B then A will take (1/3)rd of the Time.

This can be proved with the help of the following proportionality

$$\text{Efficiency} \propto \frac{1}{time\ taken}$$

i.e. if you are comparing the efficiencies and time taken by two people ,

EHA × Time A = EHB × Time B

MDH formula

MDH formula is used to compare the works of the same nature done at two different times using different manpower. The MDH formula can be represented as

$$\frac{M_1D_1H_1E_1}{W_1} = \frac{M_2D_2H_2E_2}{W_2}$$

Where, M = denotes the number of men/women, D = denotes the number of days, H = denotes the number of hours in a day, E = denotes the efficiency of 1 man, and W = denotes part of work done

Variety Questions

Q.1. Two pipes X and Y can fill a cistern in 21 hours and 24 hours, respectively. The pipes are opened simultaneously and it is found that due to a leakage in the bottom it takes 48 minutes more to fill the cistern. When the cistern is full, in how much time will the leak empty it if no pipe is open during that time?
Group D 18/08/2022 (Afternoon)
(a) 130 hours (b) 120 hours
(c) 144 hours (d) 168 hours

Q.2. Two pipes A and B can fill a cistern in 36 minutes and 48 minutes, respectively. Both the pipes are opened at the same time and pipe B is closed after some time. If the cistern gets filled in half an hour, then after how many minutes was pipe B closed?
Group D 22/08/2022 (Evening)
(a) 8 (b) 5 (c) 10 (d) 9

Q.3. A tank is filled by three pipes A, B and C in 4 hours. Pipe C is twice as fast as pipe B, and pipe B is twice as fast as pipe A. How much time will be taken by pipe A to fill the tank?
Group D 23/08/2022 (Evening)
(a) 25 hours (b) 26 hours
(c) 20 hours (d) 28 hours

Q.4. Two pipes, A and B. can fill a tank of 1000 litres in 5 hours and 6 hours, respectively. If they are opened together, how many hours will they take to fill an empty tank of 1800 litres?
Group D 24/08/2022 (Evening)
(a) $\frac{25}{11}$ (b) $\frac{54}{11}$ (c) $\frac{45}{11}$ (d) $\frac{52}{11}$

Q.5. It takes two pipes A and B, running together, to fill a tank completely in 4 minutes. If it takes A, 6 minutes less than B, to fill the tank completely, then what will be the time taken by B alone to fill the tank completely?
Group D 26/08/2022 (Morning)
(a) 20 min (b) 6 min (c) 15 min (d) 12 min

Q.6. There are 4 pipes attached to a tank. Two to fill the tank and the other two to transfer the water into a cistern. The first two pipes can fill the tank in 40 sec and 80 sec, respectively, when opened alone, while the last two can empty in 80 sec and 160 sec, respectively, when opened alone. If all the pipes are opened together, in how much time will the tank be filled ?
Group D 01/09/2022 (Evening)
(a) 53.33 sec (b) 24.44 sec
(c) 16.8 sec (d) 21.2 sec

Q.7. A tank is attached with 30 pipes, some of these are filling pipes and the rest are emptying pipes. Each filling pipe can fill the tank completely in 24 hours and each emptying pipe can empty the tank completely in 18 hours. When all the pipes are opened together, it takes $1\frac{1}{2}$ hours to fill the tank completely. How many of the given pipes are emptying pipes ?
Group D 28/09/2022 (Evening)
(a) 8 (b) 6 (c) 12 (d) 9

Q.8. If pipe A can fill a cistern in X hours, pipe B can fill the same cistern in Y hours, and pipe C can empty the full cistern in Z hours, then find the time taken to completely fill the cistern, if Pipes A, B and C are opened together.
Group D 29/09/2022 (Afternoon)
(a) $\frac{XYZ}{YZ+XZ-XY}$ (b) $\frac{XYZ}{YZ+XZ+XY}$
(c) $\frac{XYZ}{YZ-XZ-XY}$ (d) $\frac{XYZ}{YZ-XZ+XY}$

Q.9. Pipe P can fill a tank in 28 minutes and pipe Q can fill it in 35 minutes. If pipes P and Q are opened simultaneously when the tank is empty and pipe P is closed after 12 minutes, then how much more time will it take pipe Q to fill the remaining tank by itself ?
Group D 07/10/2022 (Evening)
(a) 12 minutes (b) 16 minutes
(c) 14 minutes (d) 8 minutes

Q.10. A pool has 3 taps. The first tap takes 4 days, the second tap takes 2 days and the third tap takes only 12 h to fill the pool.How long will it take to fill the pool using all the three taps ?
NTPC CBT - I 09/01/2021 (Evening)
(a) $6\frac{1}{2}$ days (b) 6 days
(c) $8\frac{8}{11}\ h$ (d) $1\frac{1}{11}\ h$

Q.11. 28 pipes are connected to a tank. Some of them pour water into the tank, whereas the rest drain water out of it. Each of the pipes that fill water can fill the empty tank in 14 hours, whereas any of the drainpipes can empty the filled tank in 35 hours, If all the pipes are opened simultaneously when the tank is empty and the tank is filled in 2.5 hours, how many of pipes were drain pipes ?
NTPC CBT - I 19/03/2021 (Morning)
(a) 16 (b) 18 (c) 17 (d) 15

Q.12. Two pipes can fill a tank in 20 hours and 60 hours respectively. A third pipe is an outlet pipe. If all three are opened together, the tank gets filled up in 40 hours. What time will the outlet pipe take to empty the full tank ?
RRB JE 29/05/2019 (Afternoon)
(a) 24 hours (b) 28 hours
(c) 20 hours (d) 30 hours

Q.13. A pipe P can drain out water from a tank in 20 hours. Another pipe Q can drain 20 litres per hour. If both drains are opened, the tank is emptied in 12 hours. What is the capacity of the tank ?
RRB JE 02/06/2019 (Afternoon)
(a) 400 litres (b) 800 litres
(c) 650 litres (d) 600 litres

Q.14. A tank is fitted with three inlets. The first two when opened simultaneously fill the tank in the same time as that taken by the third inlet alone. The second inlet can fill the tank 5 hours faster than the first and 4 hours slower than the third. In how many hours can the first inlet alone fill the tank ?
RRB JE 26/06/2019 (Morning)
(a) 15 hours (b) 6 hours
(c) 12 hours (d) 10 hours

Q.15. Pipes A and B, when working together, can fill an empty tank in 8 hours. If B is stopped after 2 hours, it will take a total of 11 hours to fill the tank. How long would it take A to fill the empty tank alone ?
RRB ALP Tier - I 14/08/2018 (Evening)
(a) 13 hours (b) 12 hours
(c) 16 hours (d) 15 hours

Q.16. One of the two inlet pipes works twice as efficiently as the other. The two, working alongside a drain pipe that can empty a cistern all by itself in 8 hours, can fill the empty cistern in 8 hours. How many hours will the less efficient inlet pipe take to fill the empty cistern by itself ?
RRB ALP Tier - I 17/08/2018 (Afternoon)
(a) 8 (b) 6 (c) 12 (d) 10

Q.17. Two pipes A and B can fill an empty cistern in 32 and 48 hours, respectively. Pipe C can drain the entire cistern in 64 hours when no other pipe is in operation. Initially, when the cistern was empty Pipe A and Pipe C were turned on. After a few hours, Pipe A was turned off and Pipe B was turned on instantly. In all it took 112 hours to fill the cistern. For how many hours was Pipe B turned on ?
RRB ALP Tier - I 29/08/2018 (Afternoon)
(a) 84 (b) 77 (c) 70 (d) 72

Q.18. Two pipes namely A,B can fill a sump in 25 minutes and half an hour respectively and a pipe C can empty 3 gallons per minute. All the three pipes working together can fill the tank in 15 minutes. The capacity of the tank is:
RRB ALP Tier - I 30/08/2018 (Morning)
(a) 600 gallons (b) 240 gallons
(c) 450 gallons (d) 300 gallons

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.19. Pipe A is 3 times faster than pipe B. Both pipes together fill a tank in 36 min. How much time will pipe A alone take to fill the tank ?
Group D 25/08/2022 (Morning)
(a) 80 min (b) 100 min
(c) 156 min (d) 48 min

Q.20. Two pipes A and B can fill the tank in 5 hours and 8 hours respectively. Pipe C can empty the same tank in 10 hours. Find the time taken to fill the empty tank when all the pipes are opened simultaneously.
Group D 25/08/2022 (Evening)
(a) $4\frac{7}{9}$ hours (b) $4\frac{4}{9}$ hours
(c) $4\frac{5}{9}$ hours (d) $4\frac{2}{9}$ hours

Q.21. One pipe can fill the tank in 20 min while another pipe can empty it in 60 min. If both the pipes are operated together, how long will it take to fill the tank completely ?
Group D 01/09/2022 (Afternoon)
(a) 20 min (b) 10 min
(c) 40 min (d) 30 min

Q.22. A large tanker can be filled by pipes A and B in 60 minutes and 30 minutes, respectively. How much time will it take to fill the empty tanker, if for half the time pipe B is opened and for the remaining time pipes A and B are opened ?
Group D 02/09/2022 (Evening)
(a) 20 minutes (b) 15 minutes
(c) 24 minutes (d) 28 minutes

Q.23. Three pipes A, B and C can fill a tank in 5 hours, 8 hours and 12 hours, respectively. If all the pipes are opened at the same time, then the time taken to fill the tank is:
Group D 05/09/2022 (Morning)
(a) $4\frac{22}{49}$ hour (b) $2\frac{22}{49}$ hour
(c) $5\frac{22}{49}$ hour (d) $3\frac{22}{49}$ hour

Q.24. A cistern has three pipes A, B and C. A and B alone can completely fill the cistern in 4 hours and 3 hours, respectively. and C can empty the completely filled cistern in 2 hours. If all the three pipes are opened simultaneously in the empty cistern, then the cistern will get completely full in:
Group D 05/09/2022 (Evening)
(a)16 hours (b)12 hours
(c) 14 hours (d) 10 hours

Q.25. A pipe can fill a tank in 15 hours. The second pipe can empty the full tank in 24 hours. If both the pipes are opened simultaneously, how long will it take to fill the tank?
Group D 06/09/2022 (Evening)
(a) 150 hours (b) 70 hours
(c) 40 hours (d) 60 hours

Q.26. Pipe A can fill a cistern in 6 hours and B can fill it in 30 hours. Both pipes were turned on but there was a leakage in the bottom of the cistern. So, the cistern took 30 minutes more to fill. The time that the leakage will take to empty the full cistern is:
Group D 09/09/2022 (Morning)
(a) 54 hours (b) 65 hours
(c) 60 hours (d) 55 hours

Q.27. Three pipes A, B and C together can fill a tank in 8 hours. Three pipes were opened for 2 hours, after that C was closed. Later A and B fill the remaining part in 9 hours. The number of hours taken by C alone to fill the tank is:
Group D 09/09/2022 (Afternoon)
(a) 20 (b) 12 (c) 24 (d) 13

Q.28. One pipe can fill a tank three times as fast as another pipe. Together the two pipes can fill the tank in 32 minutes. The slower pipe alone will be able to fill the tank in _____minutes.
Group D 12/09/2022 (Afternoon)
(a) 96 (b) 144 (c) 64 (d) 128

Q.29. Two pipes can fill a tank in 25 hours and 35 hours, respectively. The time (in hours) required to fill the tank when both pipes are opened simultaneously is:
Group D 15/09/2022 (Morning)
(a) $\frac{165}{12}$ (b) $\frac{175}{14}$ (c) $\frac{175}{12}$ (d) $\frac{165}{14}$

Q.30. If two pipes A and B function simultaneously, an empty tank will be filled in 20 hours. If pipe A, working alone, fills this empty tank 9 hours faster than pipe B can fill it working alone, then how many hours does it take pipe B to fill this empty tank while working alone ?

Group D 16/09/2022 (Evening)
(a) 42 hours (b) 39 hours
(c) 45 hours (d) 36 hours

Q.31. Two pipes A and B can fill a cistern in 21 minutes and 28 minutes, respectively. Both the pipes are opened together but after 4 minutes, pipe B is turned off. What is the total time taken to fill the tank ?
Group D 17/09/2022 (Afternoon)
(a) 18 minutes (b) 12 minutes
(c) 13 minutes (d) 15 minutes

Q.32. If three taps are opened together, a tank is filled in 12 hrs. One of the taps can fill it in 10 hrs and another in 15 hrs, whereas the third pipe is a drainpipe that empties the tank. In how much time can the third pipe can empty the filled tank when no other pipe is open ?
Group D 19/09/2022 (Afternoon)
(a) 9 hrs (b) 10 hrs (c) 11 hrs (d) 12 hrs

Q.33. Two pipes A and B can fill a tank completely in 5 hours and 8 hours, respectively. Pipe C can empty the tank completely in 10 hours. If all the three pipes are opened simultaneously in an empty tank, then how much time (hours) will it take to fill the tank completely ?
Group D 19/09/2022 (Afternoon)
(a) $4\frac{4}{9}$ (b) 6 (c) 3 (d) $4\frac{2}{9}$

Q.34. One pipe can fill a tank three times as fast another one. Both the pipes opened together can fill the tank completely in 36 minutes. In how many hours will the faster pipe alone fill the empty tank completely?
Group D 20/09/2022 (Afternoon)
(a) $\frac{8}{5}$ (b) $\frac{4}{5}$ (c) $\frac{1}{2}$ (d) $\frac{12}{5}$

Q.35. A cistern has a hole in the bottom through which the water is leaking. A tap can fill the cistern in 3 hours and the hole in the bottom can empty the fully filled cistern in 5 hours. If both the tap and the hole are open, then what will be the time taken to completely fill the empty cistern ?
Group D 28/09/2022 (Morning)
(a) 6.5 hours (b) 7 hours
(c) 7.5 hours (d) 8.5 hours

Q.36. A water tank can be filled in 9 minutes by using 15 pipes of the same capacity. In how many minutes will the water tank be filled if we use 20 pipes of the same capacity as above?
Group D 28/09/2022 (Evening)
(a) 6.75 (b) 18 (c) 10 (d) 13

Q.37. A and B are emptying pipes and C is a filling pipe. Pipes A and B can empty a full tank in 15 hours and 18 hours, respectively. When all three pipes are opened together, it takes $1\frac{1}{4}$ hours to empty $\frac{1}{9}$ part of the tank. In how many hours can pipe C alone fill $\frac{2}{3}$ part of the tank ?
Group D 06/10/2022 (Afternoon)
(a) 20 (b) 25 (c) 30 (d) 18

Q.38. Pipe A can fill a tank in 8 hours. Pipes B and C can empty the full tank in 20 hours and 15 hours, respectively. Pipes A and B are opened together for 5 hours, and then B is closed, and C is opened instantly. The tank will be full in a total time of :
Group D 06/10/2022 (Afternoon)
(a) $10\frac{5}{7}$ hours (b) $15\frac{5}{7}$ hours
(c) $10\frac{3}{7}$ hours (d) $11\frac{2}{7}$ hours

Q.39. Pipe K can fill a water tank in 10 hours. Pipe K is opened alone when the water tank is empty. When half of the water tank is filled by pipe K, then 4 more identical pipes are opened. What will be the total time taken to fill the water tank?
Group D 07/10/2022 (Evening)
(a) 6 hours 15 minutes
(b) 7 hours 15 minutes
(c) 6 hours 45 minutes
(d) 6 hours

Q.40. A pipe can fill an empty tank in 15 hours, but due to a leak in the bottom, it is filled in 20 hours. If the tank is full, how long will it take to empty the leak if no other entry or exit point into the tank is open ?
Group D 11/10/2022 (Evening)
(a) 40 hours (b) 50 hours
(c) 30 hours (d) 60 hours

RRB NTPC CBT - 2 (09/05/2022 to 17/06/2022)

Q.41. Pipe A can fill 50% of a tank in 4 hours and pipe B can completely fill the same tank in 12 hours. If both the pipes are opened at the same time, then in how much time will the empty tank be completely filled ?
Level 6 (09/05/2022) Shift 2
(a) 4 hours 52 minutes
(b) 4 hours 48 minutes
(c) 4 hours 40 minutes
(d) 4 hours 55 minutes

Q.42. A pipe can fill an empty tank in 12.5 hours. At the bottom of the tank there was a leakage point which can drain the completely filled tank in 17.5 hours. The leakage point could be closed after 14 hours of opening the pipe to fill the tank. What was the total time taken (in hours) to fill the tank ?
Level 5 (15/06/2022) Shift 2
(a) 22.5 (b) 20.5 (c) 27 (d) 25

Q.43. Pipes A and B can fill an empty tank completely in 42 minutes and 56 minutes respectively. Pipe C alone can empty the full tank in 84 minutes. All the three pipes are opened together for 8 minutes and then C is closed. In how much time (In minutes) will A and B together fill the remaining part of the tank ?
Level 2 (16/06/2022) Shift 3
(a) $18\frac{2}{7}$ (b) 16 (c) $17\frac{1}{7}$ (d) 18

Q.44. Pipes A and B can fill a tank in 30 hours and 45 hours, respectively while pipe C alone can empty the full tank in 20 hours. When the tank is full, C alone is opened for 8 hours and then closed and pipes A and B are opened together at the same time. Now, how much time will pipe A and B together take to fill the tank completely ?
Level 3 (17/06/2022) Shift 2
(a) 7.5 hours (b) 8 hours
(c) 7.8 hours (d) 7.2 hours

RRB NTPC CBT - 1 (28/12/2020 to 31/07/2021

Q.45. A tank has 3 taps to fill water. The first tap takes 6 h, the second tap takes 1 day and the third tap takes 18 h to fill the tank. But there was a hole at the bottom, capable of emptying the completely filled tank in 18 h. The hole was detected after 1 h and was immediately fixed. How long will it take to fill the tank using all the three taps ?
RRB NTPC 10/01/2021 (Morning)
(a) 4 h (b) 3 h (c) $4\frac{4}{5}$ h (d) $3\frac{15}{19}$ h

Q.46. A water tank is made up of an aluminium sheet 3 cm thick. The tank is open at the top. It's external dimensions are 1.30m, 1.06m and height 8.3 m. What is the cost of painting the inner surface of the tank at 50 paise per 100 sq m.
RRB NTPC 10/01/2021 (Evening)
(a) Rs 240 (b) Rs 219
(c) Rs 249 (d) Rs 149

Q.47. A tank has two inlets, A and B, which can fill it in 15 hours and 20 hours,

respectively. An outlet C can empty the full tank in 12 hours. If A , B , and C are opened together when the tank is empty, then in how many hours will the tank be filled ?
RRB NTPC 20/01/2021 (Morning)
(a) 35 hours (b) 30 hours
(c) 40 hours (d) 27 hours

Q.48. Tap A can fill a tank in 6 h, whereas Tap B can fill it in 8 h. Tap C can empty the same tank in 4 h. If all the taps are opened together, how long will it take to fill the tank ?
RRB NTPC 28/01/2021(Morning)
(a) 20 h (b) 22 h (c) 26 h (d) 24 h

Q.49. An inlet pipe can fill the tank in 4 h and an outlet pipe can empty the tank in 6 h. By mistake , both the pipes are kept open. Find the number of hours in which the tank will be half - full.
RRB NTPC 30/01/2021 (Morning)
(a) 8 h (b) 6 h (c) 12 h (d) 10 h

Q.50. A tank can be filled by 5 pipes in 80 minutes. How long will it take to fill the tank by 8 pipes of same dimensions ?
RRB NTPC 05/02/2021 (Morning)
(a) 50 minutes (b) 78 minutes
(c) 128 minutes (d) 30 minutes

Q.51. 6 pipes, all of the same type, are required to fill a tank in 1 h 20 min. How long will it take if only 5 pipes of the same type are used ?
RRB NTPC 10/02/2021 (Morning)
(a) 1 h 63 min (b) 1 h 40 min
(c) 1 h 36 min (d) 5 h

Q.52. Pipes A and B are fitted to a tank. A is the filling pipe and B can be used for filling or emptying at the same rate. When B is used for filling, it takes time 't' along with A to fill the tank. If it is used for emptying when A is filling the tank, the time taken for the tank to fill up would be '5t'. Find the ratio of the rates of A and B.
RRB NTPC 03/04/2021 (Morning)
(a) 5 : 1 (b) 1 : 3 (c) 3 : 2 (d) 2 : 3

RRB JE
(22/05/2019 to 28/06/2019)

Q.53. A tap can fill a tank in 6 hours. After half the tank is filled, three more similar taps are opened. What is the total time taken for the tank to get filled?
RRB JE 31/05/2019 (Evening)
(a) 2 hours 20 minutes
(b) 4 hours 30 minutes
(c) 3 hours 25 minutes
(d) 3 hours 45 minutes

Q.54. An inlet pipe will fill a tank in 10 minutes. There are two outlets that can empty the tank separately in 12 and 15 minutes respectively. If all the pipes are opened and water starts filling up the tank, in what time will the tank get filled or emptied ?
RRB JE 01/06/2019 (Morning)
(a) Emptied in 20 minutes
(b) Filled in 36 minutes
(c) Emptied in 18 minutes
(d) Filled in 75 minutes

Q.55. Tank 'A' is two - fifths full. Pipe P can fill it in 10 minutes while pipe Q can empty it in 6 minutes. In what time will the tank get empty, if both P and Q are opened ?
RRB JE 01/06/2019 (Morning)
(a) 7 minutes (b) 6 minutes
(c) 6.5 minutes (d) 5.5 minutes

Q.56. Two taps can separately fill a cistern in 20 minutes and 25 minutes. Both taps are open for 10 minutes after which the slower one is closed. How long will it take to fill the remaining portion by the other tap alone ?
RRB JE 01/06/2019 (Afternoon)
(a) 10 minutes (b) 4 minutes
(c) 5 minutes (d) 2 minutes

Q.57. A cistern can be filled in 9 hours. But due to a leak, it takes one hour more. If the cistern is full, in what time will it become empty due to the leak ?
RRB JE 01/06/2019 (Evening)
(a) 60 hours (b) 30 hours
(c) 90 hours (d) 75 hours

Q.58. Two pipes P and Q together can fill a cistern in 4 hours. When opened separately, Q will take 6 hours more than P to fill the cistern. In how much time can P alone fill the cistern ?
RRB JE 02/06/2019 (Morning)
(a) 5 hours (b) 6 hours
(c) 8 hours (d) 7 hours

Q.59. Two pipes can fill a tank in 20 and 24 minutes respectively. There is an outlet in the tank that can empty it at 3 gallons per minute. If all the pipes are opened, the tank gets filled in 15 minutes. Find the capacity of the tank.
RRB JE 02/06/2019 (Morning)
(a) 108 gallons (b) 80 gallons
(c) 150 gallons (d) 120 gallons

Q.60. Pipe P works twice as fast as pipe Q and Q is twice as fast as pipe R. A tank is filled by all the three pipes together in 8 hours. How much time will Q alone take to fill the tank ?
RRB JE 26/06/2019 (Morning)
(a) 56 hours (b) 14 hours
(c) 25 hours (d) 28 hours

Q.61. One pipe works three times as fast as another. The two pipes together can fill a tank in 26 minutes. By working alone, how long will the slower pipe take to fill the tank ?
RRB JE 26/06/2019 (Evening)
(a) 54 minutes (b) 78 minutes
(c) 124 minutes (d) 104 minutes

Q.62. Three pipes P, Q and R can fill a tank in 10, 15 and 20 hours separately. P was opened at 7AM, Q at 8 AM and R at 9AM. At what time was the tank completely filled if R can work for only 3 hours at a stretch and need a 1 hour break ?
RRB JE 26/06/2019 (Evening)
(a) 12:00PM (b) 12:12 PM
(c) 12:30PM (d) 1:00PM

Q.63. Three pipes A, B and C together can fill a tank in 6 hours. They are open for 2 hours at first. Then C is closed and A and B fill the remaining part in 7 hours. In what time can C alone fill the tank ?
RRB JE 27/06/2019 (Morning)
(a) 10 hours (b) 14 hours
(c) 11 hours (d) 12 hours

Q.64. Ratio of the time taken by three taps P, Q and R to individually fill a cistern is 2 : 1 : 6. Which tap is the fastest ?
RRB JE 27/06/2019 (Morning)
(a) Cannot be determined (b) P
(c) Q (d) R

Q.65. There is a leak in a tank that can empty it in 8 hours. There is also a pipe fitted to the tank that can admit 6 litres of water per hour. The pipe is opened, but due to leak, the tank gets emptied in 12 hours. What is the capacity of the tank ?
RRB JE 27/06/2019 (Morning)
(a) 80 litres (b) 120 litres
(c) 144 litres (d) 78 litres

Q.66. Working alone, three inlet pipes A , B and C can fill a swimming pool in 12 , 15 and 20 minutes respectively. If all are opened simultaneously and after 4 minutes A got blocked, and after another 1 minute B also got blocked, in what time did the inlet C could finally fill the pool ?
RRB JE 27/06/2019 (Evening)
(a) 1 minute 40 seconds
(b) 6 minutes 40 seconds
(c) 6 minutes 20 seconds
(d) 1 minute 20 seconds

Q.67. Three pipes P, Q and R can fill a tank in 30 minutes, 20 minutes and 10 minutes. When the tank is empty, all

three pipes are opened while they discharge three chemical solutions S, T and U respectively. What is the proportion of solution U in the contents in the tank after 3 minutes ?
RRB JE 28/06/2019 (Evening)
(a) $\frac{6}{11}$ (b) $\frac{4}{11}$ (c) $\frac{5}{11}$ (d) $\frac{7}{11}$

RRB ALP Tier - 2 (21/01/2019 to 08/02/2019)

Q.68. Pipes P and Q when operated together fill a ditch in 12 minutes. Q and R working together can fill it in 20 minutes and P and R working together can fill it in 15 minutes. In how many minutes can all the 3 pipes when operated together fill the ditch ?
ALP Tier II 21/01/2019 (Evening)
(a) 2 minutes (b) 10 minutes
(c) 3 minutes (d) 4 minutes

Q.69. Pipes A and B fill a tank at $30m^3$/ hr and $40m^3$ / hr respectively. Together they fill the tank in 4 hours. Find the volume of the tank.
ALP Tier II 21/01/2019 (Evening)
(a) $360m^3$ (b) $200m^3$ (c) $280m^3$ (d) $180m^3$

Q.70. Pipe A fills a tank at the rate of 50 m^3/hr. Pipe B takes 4 hours to fill the same tank. When opened together, they fill the same tank in 2 hours. Find the volume of the tank ?
ALP Tier II 21/01/2019 (Morning)
(a) 100 m^3 (b) 225 m^3
(c) 200 m^3 (d) 150 m^3

Q.71. Pipe A can fill a tank in 6 hours. Pipe B can empty it in 15 hours. If both the pipes are opened simultaneously, in how many hours the tank will be filled ?
ALP Tier II 23/01/2019 (Morning)
(a) 8 (b) 12 (c) 10 (d) 9

Q.72. Pipes A and B can fill a tank in 15 and 10 hours respectively. Pipe C can empty it in 40 hours. If all the three pipes are opened simultaneously, the tank will be filled by:
ALP Tier II 08/02/2019 (Morning)
(a) $\frac{120}{17}$ hours (b) $\frac{180}{53}$ hours
(c) $\frac{17}{120}$ hours (d) $\frac{53}{180}$hours

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.73. Two pipes, when working one at a time, can fill a cistern in 3 hours and 4 hours, respectively while a third pipe can drain the cistern empty in 8 hours. All the three pipes were opened together when the cistern was $\frac{1}{12}$ full. How long did it take for the cistern to be completely full?
RRB ALP 09/08/2018 (Afternoon)
(a) 2 hour 10 minutes
(b) 2 hours
(c) 1 hour 45 minutes
(d) 2 hour 11 minutes

Q.74. Working together, pipes A and B can fill an empty tank in 10 hours. They worked together for 4 hours and then B stopped and A continued filling the tank till it was full. It took a total of 13 hours to fill the tank. How long would it take A to fill the empty tank alone ?
RRB ALP 09/08/2018 (Evening)
(a) 16 hours (b) 13 hours
(c) 15 hours (d) 12 hours

Q.75. Pipes A , B and C are attached to an empty stem. While the first two can fill the cistern in 4 and 10 hours, respectively, the third can drain the cistern, when filled, in 6 hours. If all the three pipes are opened simultaneously when the cistern is three -fifth full ,how many hours will be needed to fill the cistern ?
RRB ALP 10/08/2018 (Afternoon)
(a) $\frac{36}{11}$ (b) $\frac{24}{11}$ (c) $\frac{48}{11}$ (d) $\frac{60}{11}$

Q.76. Sita's bucket has thrice the capacity as Rama's bucket. It takes 60 turns for Sita's bucket to fill the empty drum. How many turns it will take for both the buckets of Sita's and Ramu's , having each turn together to fill the empty drum ?
RRB ALP 10/08/2018 (Afternoon)
(a) 30 (b) 50 (c) 40 (d) 45

Q.77. Two valves P and B can fill a sump in $37\frac{1}{2}$ minutes and 45 minutes respectively. Both valves are opened. The sump will be filled in just 30 minutes, if valve B is turned off after :
RRB ALP 13/08/2018 (Afternoon)
(a) 9 min (b) 6 min (c) 10 min (d) 5 min

Q.78. One pipe can fill an empty cistern in 4 hours while another can drain the cistern when full in 10 hours. Both the pipes were turned on when the cistern was half - empty. How long will it take for the cistern to be fill ?
RRB ALP 13/08/2018 (Evening)
(a) 6 hours 40 minutes
(b) 3 hours 20 minutes
(c) 5 hours 30 minutes
(d) 4 hours 20 minutes

Q.79. Pipes A and C can fill an empty cistern in 32 and 48 hours, respectively while Pipe B can drain the filled cistern in 24 hours. If the three pipes are turned on together when the cistern is empty, how many hours will it take for the cistern to be $\frac{2}{3}$ full ?
RRB ALP 14/08/2018 (Afternoon)
(a) 96 (b) 64 (c) 48 (d) 72

Q.80. A pipe can fill a sump with water in 2 hours. Because of a leak , it took $2\frac{2}{3}$ hours to fill the sump. The leak can drain all the water of the sump in :
RRB ALP 17/08/2018 (Morning)
(a) 6 hours (b) 11 hours
(c) 8 hours (d) 15 hours

Q.81. Two pipes A and B can fill an empty cistern in 18 and 27 hours, respectively. Pipe C can drain the entire cistern in 45 hours when no other pipe is in operation. Initially, when the cistern was empty Pipe A and Pipe C were turned on. After a few hours Pipe A was turned off and Pipe B was turned on instantly. In all, it took 55 hours to fill the cistern. For how many hours was pipe B turned on ?
RRB ALP 17/08/2018 (Morning)
(a) 30 (b) 27 (c) 45 (d) 50

Q.82. Two pipes fill a tank when working individually in 25 and 40 hours, respectively while a third pipe can drain the filled tank in 16 hours. If all the three pipes are turned on at the same time when the tank is empty, how long will it take to fill the tank completely ?
RRB ALP 17/08/2018 (Afternoon)
(a) 15 days 18 hours (b) 2 days 1 hours
(c) 16 days 16 hours (d) 1 day 7 hours

Q.83. Raghu's tanker can fill a cistern in 4 hours. After half the cistern is filled, three more similar tankers are opened. What is the total time taken to fill the cistern completely ?
RRB ALP 20/08/2018 (Afternoon)
(a) 2 h 40 min (b) 2 h 30 min
(c) 2 h (d) 3 h

Q.84. P , Q and R are channels which discharge solutions A , B , C respectively in a tank. When the tank is empty and all the three channels are opened, what is the proportion of the solution C in the tank after 3 minutes, if the channels P , Q and R can fill the tank from empty to full in 30 minutes and 20 minutes and 10 minutes respectively when they are opened one at a time.
RRB ALP 21/08/2018 (Morning)

(a) 5 (b) 6 (c) $\frac{6}{11}$ (d) $\frac{5}{11}$

Q.85. A tank is filled by three tankers with uniform flow. The first two tankers operating simultaneously fill the sump in the same time during which the sump is filled by the third tanker alone. The second tanker fills the sump 5 hours faster than the first tanker and 4 hours slower than the third tanker. The time required by the first tanker is :
RRB ALP 21/08/2018 (Evening)
(a) 16 hours (b) 9 hours
(c) 10 hours (d) 15 hours

Q.86. A pump can fill a tank in 4 hours, but due to a leak, the tank now gets filled in 5 hours. How long will it take the leakage to empty the tank when it is full ?
RRB ALP 29/08/2018 (Evening)
(a) 20 hours (b) 4.5 hours
(c) 9 hours (d) 1 hour

Q.87. Pipe A could fill an empty cistern in 18 hours while Pipe B can drain a filled cistern in 30 hours. When the cistern is empty, Pipe A is turned on for an hour and then turned off. Now Pipe B is allowed to drain out water from the cistern for an hour and then turned off. The pipes were alternately left open for an hour each time till the cistern was full. How much time did it take for the cistern to be full ?
RRB ALP 30/08/2018 (Evening)
(a) 45 hours (b) 86 hours 40 minutes
(c) 90 hours (d) 86 hours 48 minutes

Q.88. Pipe A can fill an empty cistern in 4 hours while along with Pipe B it can fill it up in 3 hours. Only Pipe A is turned on for an hour after which Pipe B is also turned on. How much total time will it take to fill up the cistern ?
RRB ALP 31/08/2018 (Afternoon)
(a) 3 hours
(b) 3 hours 15 minutes
(c) 3 hours 20 minutes
(d) 3 hours 25 minutes

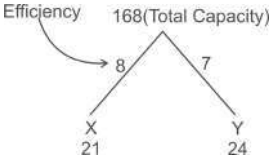
Q.89. Pipes A, B and C are attached to an empty cistern. While the first two can fill the cistern in 4 and 10 hours, respectively, the third can drain the cistern, when filled, in 6 hours. If all the three pipes are opened simultaneously when the cistern is half-full, how many hours will be needed to fill the cistern ?
RRB ALP 31/08/2018 (Evening)
(a) $\frac{90}{11}$ (b) $\frac{30}{11}$ (c) $\frac{60}{11}$ (d) $\frac{120}{11}$

Answer key:-

1.(d)	2.(a)	3.(d)	4.(b)
5.(d)	6.(a)	7.(b)	8.(a)
9.(d)	10.(c)	11.(a)	12.(a)
13.(d)	14.(a)	15.(b)	16.(c)
17.(d)	18.(c)	19.(d)	20.(b)
21.(d)	22.(c)	23.(b)	24.(b)
25.(c)	26.(d)	27.(c)	28.(d)
29.(c)	30.(c)	31.(a)	32.(d)
33.(a)	34.(b)	35.(c)	36.(a)
37.(a)	38.(b)	39.(d)	40.(d)
41.(b)	42.(a)	43.(a)	44.(d)
45.(a)	46.(*)	47.(b)	48.(d)
49.(b)	50.(a)	51.(c)	52.(c)
53.(d)	54.(a)	55.(b)	56.(d)
57.(c)	58.(b)	59.(d)	60.(d)
61.(d)	62.(c)	63.(b)	64.(c)
65.(c)	66.(a)	67.(a)	68.(b)
69.(c)	70.(c)	71.(c)	72.(a)
73.(b)	74.(c)	75.(b)	76.(d)
77.(a)	78.(b)	79.(b)	80.(c)
81.(c)	82.(c)	83.(b)	84.(c)
85.(d)	86.(a)	87.(d)	88.(b)
89.(b)			

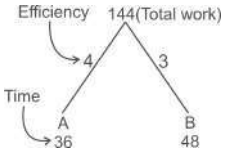
Solutions:-

Sol.1.(d)



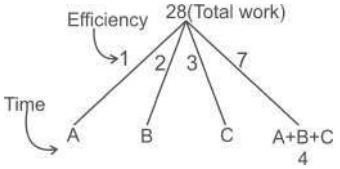
(X + Y) will fill the tank in
$\frac{168}{8+7} = 11\ hr\ 12\ minutes$
But due to leakage it takes 48 minutes more, 11 hr 12 min + 48 min = 12 hr
(X + Y + L)'s efficiency = $\frac{168}{12} = 14$
Leakage efficiency = (8 + 7) - 14 = 1
Leakage will empty the full tank in
= $\frac{168}{1} = 168\ hours$

Sol.2.(a)



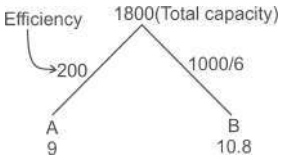
Pipe A opened from beginning to end = Total Part filled by pipe A in 30 minutes
= 30 × 4 = 120
Now, remaining part filled by pipe B
= 144 - 120 = 24
Total Time taken by pipe B to fill 24th part = $\frac{24}{3}$ = 8 minutes

Sol.3.(d)



Time taken by pipe A = $\frac{28}{1} = 28\ hours.$

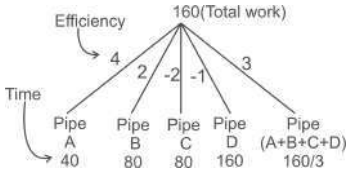
Sol.4.(b)
Pipe A can fill 1000 litres in 5 hours
It will fill 1800 litres tank in 9 hr
Pipe B can fill 1000 litres in 6 hours
It will fill 1800 litres tank in 10.8 hr



Efficiency of A and B
= $200 + \frac{1000}{6} = \frac{1100}{3}$
Pipe A and Pipe B will fill the tank in
$\frac{1800 \times 3}{1100} = \frac{54}{11}\ hr$

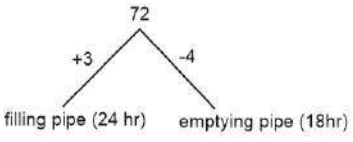
Sol.5.(d)
Let the time taken by B = x minutes
then the time taken by A = (x - 6) minutes
$\frac{1}{x} + \frac{1}{x-6} = \frac{1}{4}$
$\Rightarrow \frac{x-6+x}{x\,(x-6)} = \frac{1}{4}$
$\Rightarrow 8x - 24 = x^2 - 6x \Rightarrow x^2 - 14x + 24 = 0$
$\Rightarrow x^2 - 12x - 2x + 24 = 0$
$\Rightarrow (x - 12)(x - 2) = 0$
2 is not possible.
Therefore , x = 12 minutes, is the right answer.

Sol.6.(a)



Time taken by all pipes to fill the tank
= $\frac{160}{3} = 53.33\ sec$

Sol.7.(b) Let the number of emptying pipes = x



ATQ , (30 - x) × 3 × $\frac{3}{2}$ - x × 4 × $\frac{3}{2}$ = 72

$\Rightarrow \frac{270-9x-12x}{2}$ = 72

$\Rightarrow 270 - 21x = 144$

$\Rightarrow 21x = 270 - 144 = 126$

So no. of emptying pipes (x)

$= \frac{126}{21} \rightarrow x = 6$

Sol.8.(a) Pipe A can fill a cistern in X hours Pipe B can fill a cistern in Y hours Pipe C can empty a cistern in Z hours

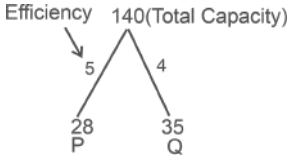
Total efficiency of pipe A, B and C

$= \frac{1}{x} + \frac{1}{y} - \frac{1}{z} = \frac{yz+zx-xy}{xyz}$

Total time of pipe A, B and C

$= \frac{xyz}{yz+zx-xy}$

Sol.9.(d)



Work done in 12 minutes

= (5 + 4) × 12 = 108

unit Remaining work

= 140 - 108 = 32

unit Time taken by Q to fill the tank

$= \frac{32}{4}$ = 8 min

So, required time = 8 min

Sol.10.(c)

The first tap takes 4 days = 96 hours

The second tap takes 2 days = 48 hours

The 3rd tap takes 12 hours

Total work = LCM of (96 , 48 , 12) = 96

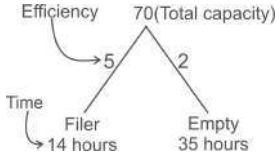
Efficiency of 1st tap = 1

Efficiency of 2nd tap = 2

Efficiency of 3rd tap = 8

Total time taken by three taps to fill the tank = $\frac{96}{11} = 8\frac{8}{11}$hours.

Sol.11.(a)



Efficiency of all pipes together = $\frac{70}{2.5}$ = 28

Let the number of filling pipes = x

Number of drain pipes = 28 - x

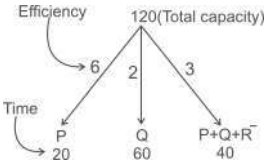
Efficiency should be equal for all pipes if all pipes opened together.

$5x - 2(28 - x) = 28$

$\Rightarrow 7x = 84 \Rightarrow x = 12$

Number of drain pipes = 28 - 12 = 16

sol.12.(a)



Efficiency of R

= (P + Q + R) - (P + Q) = 5

Time taken by outlet pipe (R) to empty the tank → $\frac{120}{5}$ = 24 hours

Sol.13.(d) According to question ,

If both drains are opened, the tank is emptied in 12 hrs.

Pipe P can drain out 100% water in 20 hrs.

Pipe P in 12 hrs. → drain out 60% of the total capacity of tank

So , Pipe Q in 12 hrs. → drain out 40% of the total capacity of tank

40% of capacity = 12 × 20 = 240 ltrs.

Total capacity (100%) = 600 ltrs.

Sol.14.(a) Let the third pipe taken x hrs to fill the tank

Then,Time taken by second inlet be → (x + 4) hr

Time taken by first inlet be → (x + 9) hr

A.T.Q ,

$\frac{1}{x} = \frac{1}{x+4} + \frac{1}{x+9}$

x(2x + 13) = (x + 4)(x + 9) → x = 6

Therefore, time taken by First inlet to fill the tank be (x + 9) → 6 + 9 = 15 hours

Sol.15.(b) Let the total work be 1 unit

Since, the whole work is completed in 8 hrs. So, In 2 hrs , $\frac{1}{4}$ part of the tank will be filled by B.

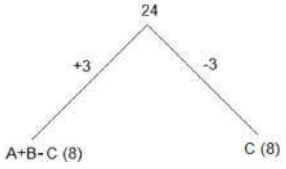
Remaining work = 1 - $\frac{1}{4} = \frac{3}{4}$th part of the tank will be filled by A in 9 hrs

So, efficiency of A = $\frac{3}{4\times 9} = \frac{1}{12}$unit

Time taken by A alone to fill the whole tank = $\frac{1}{\frac{1}{12}}$ = 12 hrs

Sol.16.(c) Let the pipe be A , B and C

The ratio of the efficiency of two inlet pipes= A : B = 2 : 1



Efficiency of inlet pipes

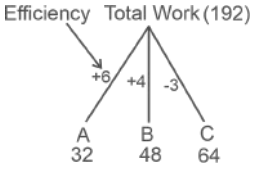
= eff(A + B – C) - eff(C) = 3 - (- 3) = 6

Efficiency of less efficient pipe (B)

$= \frac{6}{3} \times 1 = 2$

Therefore, required time = $\frac{24}{2}$ = 12 hours

Sol.17.(d)



Let pipe A and pipe C were turned on for x hrs

Work done by pipe (A + C) in x hrs

= (6 - 3)x = 3x unit

Work done by pipe (B + C) in (112 - x) hrs

= (4 - 3) × (112 - x) = (112 - x) unit

ATQ,

3x + (112 - x) = 192

⇒ 2x + 112 = 192

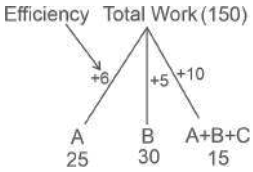
⇒ 2x = 192 - 112 = 80

x = $\frac{80}{2}$ ⇒ 40 hrs

Pipe B was turned on for

112 - 40 = 72 hrs

Sol.18.(c)



Efficiency of C

= 10 - (6 + 5) = 10 - 1 = -1 unit

Since, C can empty 3 gallons per minute.

So, the capacity of tank

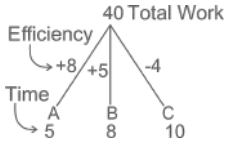
$= \frac{150}{1}$ × 3 = 450 gallons

Sol.19.(d) Efficiency of A : B = 3 : 1

Total work = (3 + 1) × 36 = 144

Time taken by pipe A alone to fill the tank = 144 ÷ 3 = 48 min

Sol.20.(b)



(A + B - C)'s efficiency = 8 + 5 - 4 = 9

Time taken by three pipes to fill the empty tank = $\frac{40}{9} = 4\frac{4}{9}$ $hours$

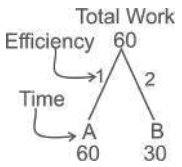
Sol.21.(d) According to the question,

Part of the tank filled in 1 minute

$= \frac{1}{20} - \frac{1}{60} \Rightarrow \frac{3-1}{60} = \frac{1}{30}$

So, the time taken to fill the tank completely = 30 minutes

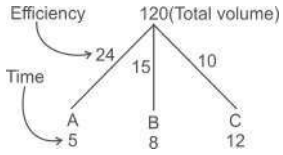
Sol.22.(c)



B works for whole time and A works for half time , then efficiency = 2 + $\frac{1}{2} = \frac{5}{2}$

Time taken by both to complete the work = $\frac{60 \times 2}{5} = 24\ min$

Sol.23.(b)



Time taken by pipe (A + B + C) to fill the tank = $\frac{120}{49} = 2\frac{22}{49}\ hours$

Sol.24.(b) As per the question,

Pipe	Time	Efficiency	Total work
+ A →	4	+ 3	
+ B →	3	+ 4	12
- C →	2	− 6	

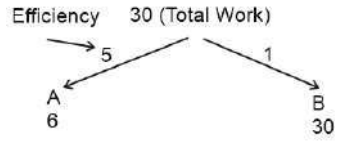
Time taken to fill the tank completely when all the three pipes are opened = $\frac{12}{3+4-6}$ = 12 hours

Sol.25.(c) According to the question,

Part of the tank filled in 1 hour = $\frac{1}{15} - \frac{1}{24} \Rightarrow \frac{8-5}{120} \Rightarrow \frac{1}{40}$

Therefore required time = 40 hour

Sol.26.(d)



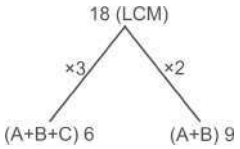
Time taken by pipe A , pipe B and leakage = $\frac{30}{6} + 30\ min = 5\frac{1}{2}\ hours$

Efficiency of (A + B - L) = $\frac{30 \times 2}{11} = \frac{60}{11}$

Efficiency of leakage = $6 - \frac{60}{11} = \frac{6}{11}$

Time taken by leakage alone to empty the pipe = $\frac{30 \times 11}{6} = 55\ hours$

Sol.27.(c) For remaining part of the tank → A , B and C can complete in 8 - 2 = 6 hours And A and B completed the remaining part in 6 hour



Efficiency of C = 3 - 2 = 1

Total capacity of tank = 8 × 3 (because A , B and C can fill the tank in 8 hour)

So, required time = $\frac{24}{1}$ = 24 hours

Sol.28.(d) Let pipe be P and Q

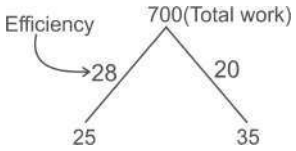
P : Q

Time → 1 : 3 so ,

Efficiency → 3 : 1

Total work = 4 × 32 = 128 units Therefore time required by slower pipe to fill the tank = $\frac{128}{1}$ = 128 minute

Sol.29.(c)



Time taken by both the pipes to fill the tank = $\frac{TOTAL\ WORK}{TOTAL\ EFFICIENCY}$

= $\frac{700}{20+28} = \frac{700}{48} = \frac{175}{12}\ hours$

Sol.30.(c) Let the time taken by A to fill the empty tank alone be X hours and the time taken by B to fill the empty tank alone be X + 9 hour Time taken by both to fill the empty tank = 20 hours

$\frac{1}{X} + \frac{1}{X+9} = \frac{1}{20}$

$\frac{X+X+9}{X(X+9)} = \frac{1}{20}$

$20(2x + 9) = x^2 + 9x$

$40x + 180 = x^2 + 9x$

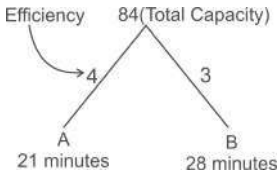
$x^2 - 31x - 180 = 0$

$x^2 - 36x + 5x - 180 = 0$

$x(x - 36) + 5 (x - 36) = 0$ = X = 36 hour

B takes 9 hour more than A then the total time taken by B to fill the empty tank alone = 45 hour

Sol.31.(a)

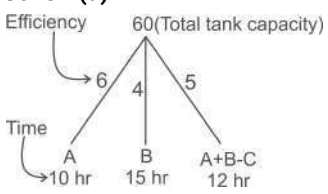


Work done by A and B in 4 min = (4 + 3) × 4 = 28 unit

Remaining area to be filled = 84 - 28 = 56 unit Now, B is turned off, Time taken to fill the tank = $\frac{56}{4}$ = 14 min

Total time = 4 + 14 = 18 min

Sol.32.(d)

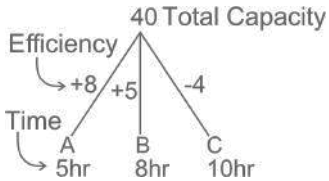


Let the efficiency of pipe C be x. Since, pipe C is a drainpipe ; $6 + 4 - x = 5$

Efficiency of pipe C ⇒ $x = 10 - 5 = 5$

Time taken by pipe C to empty the full tank = $\frac{60}{5} = 12\ hr$

Sol.33.(a)



Efficiency of (A + B - C) = 8 + 5 - 4 = 9

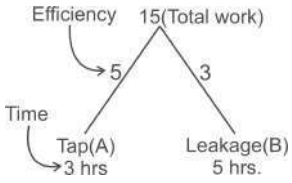
Time taken by all the pipes to fill the tank completely = $\frac{40}{9} = 4\frac{4}{9}\ hours.$

Sol.34.(b) Let the efficiency of one pipe A be 3x and the efficiency of other pipe B be x.

	Effic	time
A	3x	
B	x	
A + B	4x	36

Total capacity of the tank = 36 × 4x = 144x So, time taken by Pipe A to fill the tank completely = $\frac{144x}{3x} = 48\ min\ or\ \frac{48}{60} = \frac{4}{5}\ hours$

Sol.35.(c)



Time taken by both the pipes to fill the tank completely = $\frac{15}{5-3} = \frac{15}{2}$ = 7.5 hours

Sol.36.(a) Let the time for filling the water tank with 20 pipes = t min

9 × 15 = t × 20 → t = 6.75 min

Sol.37.(a) Let the total capacity of tank = 90 unit Efficiency of A = $\frac{90}{15}$ = - 6

Efficiency of B = $\frac{90}{18}$ = - 5

1/9th of the total capacity = 10 unit

Efficiency of A + B + C = $\frac{10}{5} \times 4$ = - 8

(it takes to empty) - 6 - 5 + C = - 8 C = 3

2/3rd of the capacity of tank = 60 unit

Time taken by C = $\frac{60}{3}$ = 20 hour

Sol.38.(b)

Let the capacity of tank = 120 unit

Efficiency of Pipe A = $\frac{120}{8}$ = 15

Efficiency of Pipe B = $\frac{120}{20}$ = - 6

Efficiency of Pipe C = $\frac{120}{15}$ = - 8

Pipe filled by A and B in 5 hours
= (15 - 6)× 5 = 45 unit Remaining capacity = 120 - 45 = 75 unit Now, B is closed, Time taken by A and C to fill the tank
= $\frac{75}{15-8}$ = $\frac{75}{7}$ = $10\frac{5}{7}$

Total time = $10\frac{5}{7}$ + 5 = $15\frac{5}{7}$ hours

Sol.39.(d)
Let the total capacity of tank = 20 units

Efficiency of Pipe K = $\frac{20}{10}$ = 2

Time taken to fill the half tank
= $\frac{10}{2}$ = 5 hours

Remaining capacity = 20 – 10 = 10 units
Total efficiency with 4 more identical pipes = 2 + 2 + 2 + 2 + 2 = 10
Time taken by all 5 pipes to fill remaining tank = $\frac{10}{10}$ = 1 hour

Total time = 5 + 1 = 6 hours

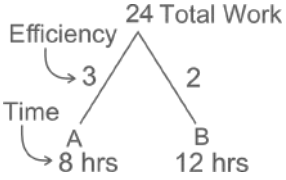
Sol.40.(d)
Let the total capacity of tank = 60 unit

Efficiency of A = $\frac{60}{15}$ = - 4

Efficiency of B = $\frac{60}{20}$ = 3

Time to empty the tank = $\frac{60}{1}$ = 60 hours

Sol.41.(b) 50% — 4 hours
100% — 8 hours



Time taken to complete the work together = $\frac{24}{3+2}$ = $4\frac{4}{5}$ hours
= 4 hours 48 minutes.

Sol.42.(a)
In 12.5 hours the pipe can fill full tank.

In 1 hour pipe will fill $\frac{2}{25}$ $tank$

In 17.5 hours leakage can empty the full tank.

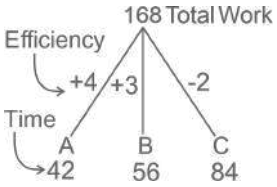
In 1 hour leakage can empty $\frac{2}{35}$ $tank$

Now, In 14 hours pipe will fill
= $14(\frac{2}{25}-\frac{2}{35}) = \frac{224}{700}$ part

Remaining tank = $1-\frac{224}{700} = \frac{476}{700}$

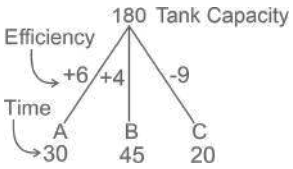
Total time taken to fill the tank
= $14+\frac{2}{25}\times\frac{476}{700} = 14+8.5$
$= 22.5\ days$

Sol.43.(a)



A,B and C started for 8 minutes
= 5 × 8 = 40
A and B will complete the remaining work in = $\frac{168-40}{4+3} = \frac{128}{7} = 18\frac{2}{7} minutes$

Sol.44.(d)

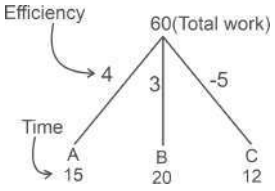


C opened for 8 hours, and emptied
= 8 × 9 = 72 unit
Now, A + B will full the tank in
= $\frac{72}{10} = 7.2\ hours$

Sol.45.(a) The efficiency ratio of the three taps and the hole = 12 : 3 : 4 : (-)4
Let the total work
= LCM of 6 , 24 , 18 = 72 units.
The hole was detected after 1 h and was immediately fixed.
So in the first one hour before the hole was detected the tank is filled by
= (12 + 3 + 4 - 4) = 15 units.
Remaining work = (72 - 15) = 57 units.
So, this 57 units of the tank will be filled by the three taps in
= $\frac{57}{(12+3+4)}$ = 3 hours.
So, the total time taken to fill the tank using all the three taps is
= (1 + 3) = 4 hours.

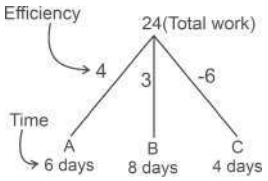
Sol.46.(*) discrepancy is found in question
Thickness of the aluminium sheet
= 3cm = 0.03 m
Internal dimensions of tank
L = 1.30 - 0.06 = 1.24 m
b = 1.06 - 0.06 = 1 m
h = 8. 30 - 0.03 = 8.27 m
Area of the tank = Lb + 2bh + 2Lh
= $1.24\times1+2\times1\times8.27+2\times1.24\times8.27$
= 1.24 + 16.54 + 20.5096 = 38.2896 m^2
Cost of painting for 100 m^2 = 50 paise
Cost of painting for 38.2896 m^2
= $\frac{50}{100}\times38.2896 = 19.1448\ paise.$

Sol.47.(b)



Time taken by (A + B - C) to fill the tank
= $\frac{60}{4+3-5}$ = 30 hours.

Sol.48.(d)



Total efficiency = (4 + 3) - 6 = 1
When they work together (A + B + C)
= $\frac{Total\ work}{total\ efficiency} = \frac{24}{1}$ = 24 h

Sol.49.(b)
Total work = LCM of 4 and 6 = 12
Efficiency of inlet pipe = + 3
Efficiency of outlet pipe = - 2
Overall efficiency of both pipes = + 1
Time taken to fill the tank when both pipes are open = $\frac{12}{1}$ = 12 hours
Time taken to fill tank half = 6 hours

Sol.50.(a) Work is same in both condition
5 pipes × 80 min. = 8 pipes × x
x = $\frac{5\times80}{8}$ = 50 minutes

Sol.51.(c) 6 pipe × 80 min = 5 pipe × T
T = 96 mins ⇒ 1 hr 36 min

Sol.52.(c)
Let the capacity of the tank = 5t
And capacity of pipe A = a and pipe B = b

If both (A and B) the tank are filling then it takes 1 hr

So, Efficiency of (A + B) = 5

If B is emptying and they work together its take 5 hr

So, Efficiency of (A - B) = 1

On solving A = 3 and B = 2

Required Ratio = 3 : 2

Or

	Time	T/W	Efficiency
(A + B) --	t		5
		$5t^2$	
(A - B) --	5t		1

On solving A = 3 and B = 2

Required Ratio = 3 : 2

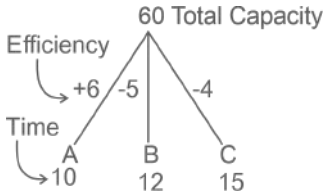
Sol.53.(d) According to the question

Let total work is 6 unit and A tap can fill a tank in 6 hours then 1 hours = $\frac{6}{6}$

1 unit Given that half of the tank is full then remaining is 3 unit according to question = $\frac{3}{4}$ × 60 ⇒ 45 minutes

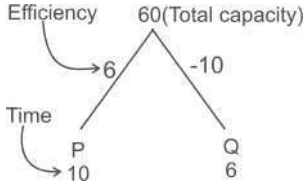
Total time taken to get filled Tank
= 3 hours 45 minutes

Sol.54.(a)



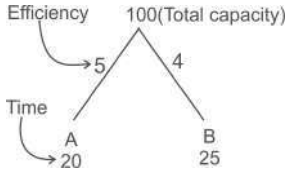
Total efficiency (A, B and C)
→ 6 − 5 − 4 = − 3
Total time taken by A, B and C to empty the tank → $\frac{60}{3}$ = 20 minute

Sol.55.(b)



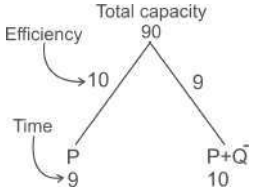
A.T.Q,
Total capacity of tank = 5 unit = 60 L
1 unit = 12 L
Tank A is filled with water
= (2 × 12) = 24 L
Time taken by P and Q to empty the filled tank = $\frac{24}{4}$ = 6 Minutes

Sol.56.(d)



Total tank filled by both tap A and B in 10min. = 10 × (5 + 4) = 90 unit
Remaining portion
= (100 - 90)unit = 10 unit
Tap A (faster tap) filled remaining 10 unit in → $\frac{10}{5}$ ⇒ 2min.

Sol.57.(c)



So, Leak(Q) can empty 1 unit in 1 hour .
Time taken by Leak(Q) to empty the tank
= $\frac{90}{1}$ = 90 hours

Sol.58.(b) Let , Pipe P alone fill the cistern in x hours.
According to the question,
$\frac{1}{x} + \frac{1}{(x+6)} = \frac{1}{4}$
$\frac{x+6+x}{x(x+6)} = \frac{1}{4}$
$8x + 24 = x^2 + 6x$
$x^2 - 2x - 24 = 0$
$\Rightarrow x = 6, -4$ .... time can't be in -ve.
So , $x = 6$ hours

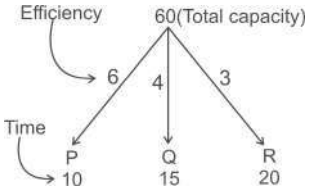
Sol.59.(d) Let the outlet pipe empty the tank in x minutes.
According to the question, we have
$\frac{1}{20} + \frac{1}{24} - \frac{1}{x} = \frac{1}{15}$
$\frac{1}{x} = \frac{1}{20} + \frac{1}{24} - \frac{1}{15} \Rightarrow$ x = 40
Since outlet pipe can empty 3 gallons per minute.
So, the capacity of the tank
= 40 × 3 = 120 gallons

Sol.60.(d) Ratio of efficiency
→ P : Q = 2 : 1
Q : R = 2 : 1
Equating the efficiency , we get
P : Q : R = 4 : 2 : 1
Total efficiency(P + Q + R) = 7 units and
Total Capacity → 7 × 8 = 56 then
Time taken by Q alone to fill the tank
= $\frac{56}{2}$ = 28 hrs.

Sol.61.(d)

Efficiency of pipe A and B ⇒ $\frac{A}{B} = \frac{3}{1}$
Total capacity = 26 × 4= 104 units
So, slower pipe (B) alone filled the tank in
= $\frac{104}{1}$ = 104 minutes.

Sol.62.(c)



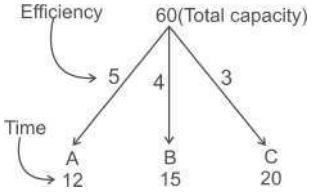
Till 12pm total tank fill by P,Q and R is
5 × (efficiency of P) + 4 × (efficiency of Q) + 3 × (efficiency of R)
= 5 × 6 + 4 × 4 + 3 × 3 = 55 units
Now remaining work = (60- 55) units = 5 units
5 unit filled by P + Q in = $\frac{5}{6+4} = \frac{1}{2}$hr.
At 12 : 30 PM the tank gets completely filled .

Sol.63.(b) According to question ,
$(A + B + C) \times 6 = (A + B + C) \times 2 + (A + B) \times 7$
6A + 6B + 6C = 2A + 2B + 2C + 7A + 7B
6A + 6B + 6C = 9A + 9B + 2C
4C = 3A + 3B ⇒ $\frac{A+B}{C} = \frac{4}{3}$
Total capacity= 7 × 6 hours = 42 units
Time taken by C = $\frac{42}{3}$ = 14 hours

Sol.64.(c) efficiency ∝ $\frac{1}{time}$
Ratio of time of taps P,Q and R = 2 : 1 : 6
Efficiency of taps P, Q and R are
= $\frac{1}{2} : \frac{1}{1} : \frac{1}{6}$ = 3 : 6 : 1
Clearly , the fastest tap is Q .

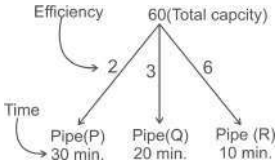
Sol.65.(c)
Let the capacity of tank be x litres
In one hour tank empties = $\frac{x}{8}$
In one hour, tap admits 6 litres
After opening the tap, the tank is emptied in 12 hours.
So in one hour tank empties by = $\frac{x}{12}$
Therefore equation becomes
→ $\frac{x}{8} - \frac{x}{12} = 6$
⇒ $\frac{x}{24} = 6$ → x = 144 litres.

Sol.66.(a)



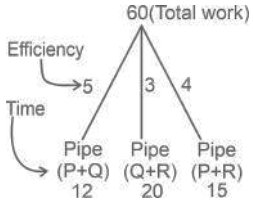
Swimming Pool filled by A,B and C in 4 minutes = 12 × 4 = 48 units
Now, Pipe A is blocked , and after 1 minute pipe B is also closed .
Pool filled by (B + C) in 1min.
= 1 × 7 = 7 Units
Time taken by C to fill the remaining pool
= $\frac{60-(48+7)}{3}$ = 1 minute 40 seconds

Sol.67.(a)



Total tank filled in three minutes
→ (2 + 3 + 6) × 3 = 33 units
Solution U in the tank after three minutes
→ (6) × 3 = 18 units
Required ratio → $\frac{18}{33} = \frac{6}{11}$

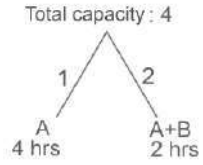
Sol.68.(b)



2(P + Q + R) = 5 + 3 + 4 = 12
So, efficiency of P , Q and R = 6
Time taken to fill the tank completely
$\rightarrow \frac{60}{6} = 10\ minutes.$

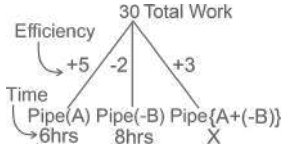
Sol.69.(c)
Pipe A can fill 30 m^3 in 1 hour
Pipe B can fill 40 m^3 in 1 hour
Efficiency of both pipe A and B
= 30 + 40 = 70 m^3
Volume of the tank = Volume filled in one hour × total time taken to fill the tank
Now, capacity of the tank
$= 70 \times 4 = 280\ m^3$

Sol.70.(c)



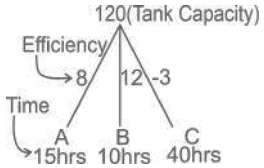
A's efficiency and B's efficiency is equal,
A fills cistern in 1 hour = 50m^3
Volume = 4 × 50m^3 = 200 m^3

Sol.71.(c)



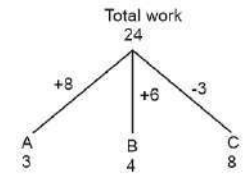
Time taken to fill the tank when both pipe are opened → $\frac{30}{(5-2)}$ = 10 hrs.

Sol.72.(a)



Total time taken to fill the tank
$\rightarrow \frac{Total\ capacity\ of\ the\ tank}{Efficiency\ of\ (A+B+C)}$
Total time taken
$\rightarrow \frac{120}{[8+12+(-3)]} = \frac{120}{17}$ hours

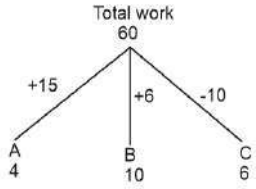
Sol.73.(b)



Efficiency of A + B − C = 8 + 6 - 3 = 11 unit
Now, the remaining capacity of cistern
$= \frac{11}{12} \times 24 = 22$ unit
Time taken by three pipes to fill the cistern = $\frac{22}{11}$ = 2 hrs

Sol.74.(c) Let the total work = 130 unit i.e.LCM of 10 and 13
Efficiency of (A + B) = $\frac{130}{10}$ = 13 unit
Work done by (A + B) in 4 hrs
= 13 × 4 = 52 unit
Remaining work = 130 - 52 = 78 unit which is completed by A in 9 hrs
Then, time taken by A alone to complete the whole work = $\frac{9}{78} \times 130 = 15$ hrs

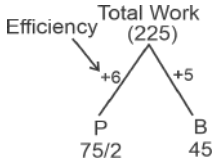
Sol.75.(b)



Efficiency of A, B and C pipe
= 15 + 6 - 10 = 21 - 10 = 11 unit
Remaining capacity of cistern
$= 60 \times \frac{2}{5}$ = 24 unit
Time taken by A , B and C pipe to fill the cistern = $\frac{24}{11}$ hrs

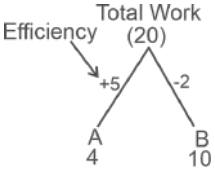
Sol.76.(d)
The efficiency of Sita and Rama = 3 : 1
Total capacity of drum
= 3 × 60 = 180 unit
Total no of turns by both of them to fill the empty drum = $\frac{180}{3+1} = \frac{180}{4}$ = 45

Sol.77.(a)



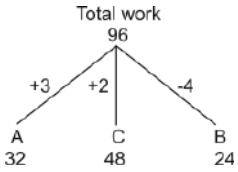
Work done by P in 30 min
= 6 × 30 = 180 unit
Remaining work = 225 - 180 = 45 unit which is completed by B in $\frac{45}{5}$ = 9min
So, valve B turned off after 9 min.

Sol.78.(b)



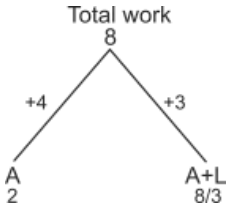
Efficiency of (A + B) = 5 - 2 = 3 unit
Remaining capacity of cistern
$= 20 \times \frac{1}{2}$ = 10 unit
Time taken by pipe A and B together to fill the tank
$= \frac{10}{3} = 3\frac{1}{3}$ hrs = 3hrs 20min

Sol.79.(b)



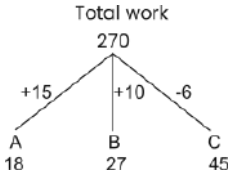
Efficiency of (A + C + B) = 3 + 2 - 4 = 1 unit
Time taken by all three pipes to fill for the cistern when it is $\frac{2}{3}$ full
$= \frac{96 \times \frac{2}{3}}{1}$ = 64 hrs

Sol.80.(c)



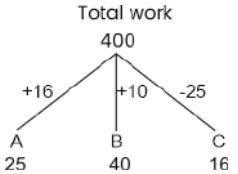
Efficiency of L = 4 - 3 = 1 unit
Time taken by the leak to drain all the water = $\frac{8}{1}$ = 8 hrs

Sol.81.(c) Let the pipe B was turned on for x hrs



ATQ,
15 × (55 - x) + 10x - 6 × 55 = 270
⇒ 825 - 15x + 10x - 330 = 270
⇒ 825 - 5x = 270+330 = 600
⇒ 5x = 225 ⇒ x = $\frac{225}{5}$ = 45

Sol.82.(c)



Efficiency of (A + B + C) = 16 + 10 - 25
= 1 unit
Time taken by all of them to fill the whole tank = $\frac{400}{1}$ = 400 hrs = $\frac{400}{24}$ days
= 16 days 16 hour

Sol.83.(b) Let the capacity of the cistern is 16 units and the efficiency of Raghu's tanker is 4 units/hour.

Time taken by Raghu's tanker to fill half of the cistern = $\frac{8\ units}{4\ units/hour}$ = 2 hours.

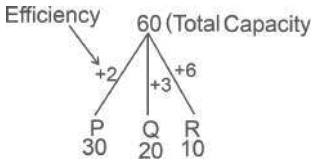
Now , three more similar tankers are open .

So time taken to fill the remaining half of the cistern →

$\frac{8\ units}{(4\times4)\ units/hour}$ = $\frac{1}{2}$ hours = 30 min.

Total time → 2 hours and 30 min.

Sol.84.(c)



Volume of solution(A) discharged by channel P in 3 min = 2 × 3 = 6 unit

Volume of solution(B) discharged by channel Q in 3 min = 3 × 3 = 9 unit

Volume of solution(C) discharged by channel R in 3 min = 6 × 3 = 18 unit

Proportion of solution (C) discharged by channel R = $\frac{18}{6+9+18}$ = $\frac{18}{33}$ = $\frac{6}{11}$

Sol.85.(d) Let the time taken by the first tanker to fill the sump be x hours

Then, the time taken by the second and third tanker to fill the sump in (x-5) hours and (x-9) hours respectively.

As per the question,

$\frac{1}{x}+\frac{1}{x-5}=\frac{1}{x-9}$

$\Rightarrow \frac{x-5+x}{x(x-5)}=\frac{1}{x-9} \Rightarrow \frac{2x-5}{x^2-5x}=\frac{1}{x-9}$

$\Rightarrow x^2$ - 5x = $2x^2$ - 18x - 5x + 45

$\Rightarrow x^2$ - 18x + 45 = 0

$\Rightarrow x^2$ - 15x - 3x + 45 = 0

⇒ x(x -15) - 3(x - 15) = 0

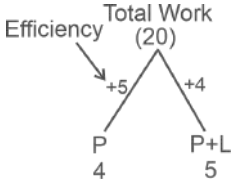
⇒ (x - 3)(x - 15) = 0

x = 3 or 15

Thus, time taken by first tanker

= 15 hours

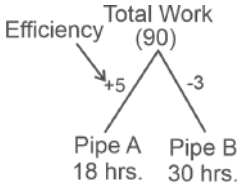
Sol.86.(a)



Efficiency of leakage = 4 - 5 = - 1 unit

So, the time taken by leakage to empty the tank = $\frac{20}{1}$ = 20 hrs

Sol.87.(d)



Tank filled in 1 cycle (2 hours)

= 5 - 3 = 2 unit

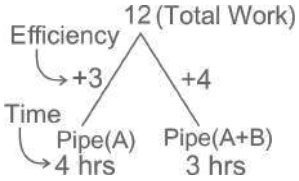
Tank filled in 43 cycle (86 hours)

= 86 units

Remaining 4 unit will be filled by Pipe in $\frac{4}{5}$ hours

Therefore , required time = 86 + $\frac{4}{5}$ hours or 86 hours 48 minutes

Sol.88.(b)



Efficiency of pipe B = 4 - 3 = 1

In the first hour , pipe A will fill 3 units of tank.

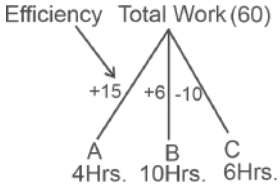
Remaining work = 12 - 3 = 9 unit

So, total time taken to fill the remaining tank = $\frac{9}{3+1}=\frac{9}{4}=2\frac{1}{4}$

Required time to fill the tank = 1 + $2\frac{1}{4}$

= $3\frac{1}{4}$ or 3 hours 15 minutes.

Sol.89.(b)



Time taken by the three pipes to fill half the tank.

= $\frac{60}{2\times(15+6-10)}=\frac{30}{11}\ hours$

Time Speed and Distance

KEY - POINTS

(1). Time

$$\text{Time} = \frac{Distance}{Speed}$$

We just need to remember this formula. If two values are given the third can be found easily.

Ex. A man travels from Delhi to Chandigarh at a speed of 50 km/h covering a distance of 300 km. Find the time taken?

Here, we are given, Distance(D) = 300 km and Speed(S) = 50 km/h.

$\therefore Time(T) = \frac{D}{S} = \frac{300}{50} = 6\ hours$

- If the distance is constant then speed ratio is inversely proportional to Time ratio. Similarly, if time is constant then Speed ratio is equal to Distance ratio.

Ex 1 : For the same distance, speed in outward journey and return journey is 50 km/h and 60 km/h. Find the ratio of the time taken.

Soln : Here, the distance is constant. So, time taken will be inversely proportional to speed.

So, the required ratio

$= \frac{1}{50} : \frac{1}{60} = \frac{6}{300} : \frac{5}{300} = 6 : 5$

Ex 2 : In the same time, find the ratio of the distance travelled by A and B at a speed of 6 km/h and 8 km/h respectively.

Soln : Here, the time taken is constant. So, the distance covered will be directly proportional to the speed.

Hence, the required ratio = 6 : 8 = 3 : 4

2). Average speed

a.) When different distance is travelled each time then,

$$Average\ Speed = \frac{Total\ Distance}{Total\ Time}$$

b.) When same distance is travelled each time then

For two terms a and b :

$$Average\ Speed = \frac{2ab}{a+b},$$

where a and b are speed

For three terms a, b and c :

$$Average\ Speed = \frac{3abc}{ab+bc+ac},$$

where a, b and c are speed

Ex. A person travels from point A to point B at a speed of 30 km/h and comes back at a speed of 20 km/h. What is his average speed?

Here, distance travelled is same,

So, average speed = $\frac{2 \times 30 \times 20}{30+20} = \frac{1200}{50}$

= 24 km/h

- Total distance traveled when a man covers a certain distance with x km/hr and comes back with y km/hr. He takes 't' hr to complete the whole journey is :

Distance(D) = $\left(\frac{xy}{x+y}\right)$ t km

Example : A man travel a certain distance by train at the rate of 25 km/hr and walk back at the rate of 3 km/hr. The whole journey took 5 hr 36 min. What distance did he travel by train ?

D = $\left(\frac{25 \times 3}{25+3}\right) \times \frac{28}{5}$ = 15 km

- Total distance travelled when a man covers a certain distance with x km/hr and he comes back with a speed of y km/hr . if he takes 't' hrs more to come back than go is :

Distance(D) = $\left(\frac{xy}{x-y}\right)$ t km

Example : A man covers a certain distance by 10 km/hr and becomes 20 min late but if he travels the same distance with 12 km/hr then he becomes 5 min late. Find the distance ?

D = $\frac{10 \times 12}{12-10} \times (20 - 5) = \frac{120}{2} \times \frac{15}{60}$ = 15 km

3). Relative Speed

(i). Same Direction -: When two things are moving in the same direction, the relative speed is given by the difference between their respective speeds.

Ex. A and B are going to a same point Z at speeds of 80 km/h and 60 km/h respectively.

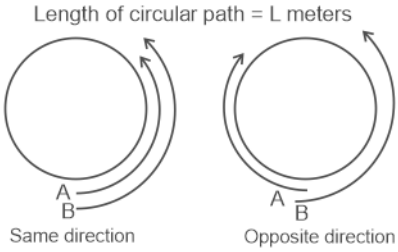
Relative speed of A with respect to B will be = 80 – 60 = 20 km/h.

(ii) Opposite direction :- When two things are moving in opposite directions, the relative speed is given by the addition of their respective speeds.

Ex. A is moving towards point Z at 60 km/h and B is going away from point Z at 80 km/h.

Relative speed of A with respect to B = 60 + 80 = 140 km/h.

4). Circular track:-



(where x m/s, y m/s are speeds of A and B respectively. L = length of the track in meters.)

- Meet first time each other at any point on the track in opposite direction = $\frac{L}{x+y}$ sec.
- Meet first time each other at any point on the track in same direction = $\frac{L}{x-y}$ sec.
- Meet each other exactly at the starting point in same or opposite direction = LCM of $\left(\frac{L}{x}, \frac{L}{y}\right)$ sec.

(i) When three persons A, B and C are running around a circular track of length L meters with speed x, y and z m/s in the same direction, then

- Meet each other at any point on the track = LCM of $\left(\frac{L}{(x-y)}, \frac{L}{(y-z)}\right)$ sec.

5). Unit Conversion:

1 km/h = $1\frac{1000\ m}{3600\ s} = \frac{5}{18}$ m/s

So, to convert km/hr to m/sec just multiply by $\frac{5}{18}$ and to convert m/sec to km/hr multiply by $\frac{18}{5}$.

Ex. 90 km/h = $90 \times \frac{5}{18}\frac{m}{s} = 25$ m/s

Also, 25 m/s $= 25 \times \frac{18}{5}\frac{km}{hr}$ = 90 km/h

- When using the unit of speed in km/h, keep in mind that the unit of time should also be in hours. When the unit of speed is used in m/s, the unit of time should also be in seconds. That is, the units of speed and time are the same.

6). Trains

Case 1: Train crossing a person or, pole. In such case the length of the person or pole is taken to be negligible. To cross the person the train has to cover distance equal to its length.

Ex. A train, of length 100 m, travelling at 90 km/hr will take how much time to cross a man?

Here, Speed = 90 km/hr

$= 90 \times \frac{5}{18}\frac{m}{s} = 25$ m/s

Distance = Length of train = 100 m

Time = $\frac{Distance}{speed} = \frac{100}{25} = 4\ seconds$

Case 2: Train crossing a platform.

In such a case the distance covered by train to cross the platform will be equal to sum of length of train and platform.

Ex. A train, of length 100 m, travelling at 90 km/hr will take how much time to cross a platform of length 150 m?

Here,Speed = 90km/hr

$= 90 \times \frac{5}{18}\frac{m}{s}$ = 25 m/s

Distance = Length of train + Length of platform = 100 + 150 = 250 m

Time = $\frac{Distance}{Speed} = \frac{250}{25}$

$= 10\ seconds$

Case 3: Train crossing another train moving in same direction. In such case the distance covered by train to cross the other train will be equal to sum of lengths of the two trains. To calculate time we need to consider relative speed of one train with respect to the other.

$Relative\ Speed = \frac{Relative\ Distance}{Relative\ Time}$

Ex. A train, of length 100 m, travelling at 90 km/hr will take how much time to cross another train, of length 50 m, moving in same direction at speed of 36 km/hr?

Here, Relative speed of first train with respect to second train =

(90 – 36) km/h $= 54 \times \frac{5}{18}\frac{m}{s}$ = 15 m/s

Distance = Length of first train + Length of second train = 100 + 50 = 150 m

Time = $\frac{Distance}{Speed} = \frac{150}{15}$ =10 seconds

Case 4: Train crossing another train moving in the opposite direction. In such case the distance covered by train to cross the other train will be equal to the sum of lengths of the two trains. To calculate time we need to consider relative speed of one train with respect to the other.

Ex. A train, of length 100 m, travelling at 90 km/hr will take how much time to cross another train, of length 50 m, moving in the opposite direction at a speed of 36 km/hr?

Here, Relative speed of first train with respect to second train = (90 + 36) $\frac{km}{hr}$

=126 $\times \frac{5}{18}\frac{m}{s}$ = 35 $\frac{m}{s}$

Distance = Length of first train + Length of second train = 100 + 50 = 150 m

Time = $\frac{Distance}{Speed} = \frac{150}{35} = \frac{30}{7}$ seconds

Case 5: Train crossing a man sitting in another train moving in the same direction.

In such a case, the distance covered by the train to cross the man will be equal to the length of the train. To calculate the time we need to consider the relative speed of the train with respect to the man. The length of the second train will not be considered.

Ex. A train, of length 100 m, travelling at 90 km/hr will take how much time to cross a man sitting in another train, of length 50 m, moving in the same direction at a speed of 36 km/hr?

Speed of the man = 36 km/hr

Here, the Relative speed of the first train with respect to the man = (90 – 36)km/h

$= 54 \times \frac{5}{18}\frac{m}{s}$= 15 m/s

Distance = Length of first train = 100 m

Time = $\frac{Distance}{Speed} = \frac{100}{15} = \frac{20}{3}$ sec

Case 6: Train crossing a man sitting in another train moving in opposite direction

In such a case the distance covered by the train to cross the man will be equal to the length of the train. To calculate time we need to consider the relative speed of the train with respect to the man. Length of the second train will not be considered.

Ex. A train, of length 100 m, travelling at 90 km/hr will take how much time to cross a man sitting in another train, of length 50 m, moving in the opposite direction at speed of 54 km/hr?

Speed of the man = 54 km/hr

Here, Relative speed of first train with respect to the man = (90 + 54)$\frac{km}{hr}$ =

$144 \times \frac{5}{18}\frac{m}{s}$ = 40 m/s

Distance = Length of first train = 100 m

Time = $\frac{Distance}{Speed} = \frac{100}{40} = \frac{5}{2}$ sec.

Case 7 : If two trains starts at same time from point A and B towards each other and after crossing each other they take a and b seconds in reaching B and A respectively, then : $\frac{A's\ speed}{B's\ speed}$ =

$$\frac{\sqrt{Time\ taken\ by\ B\ after\ meeting\ A}}{\sqrt{Time\ taken\ by\ A\ after\ meeting\ B}}$$

Other important points :

1. LCM of time taken by Plane A and Plane B shows after how much time they will meet each other at the starting point.

2. Without stoppage a person travel a distance at an average speed of x km/h and with stoppage it travels the same distance at y km/h and $x > y$, then number of minutes per hour does he stop

$= \frac{Faster\ speed - Slower\ speed}{Faster\ speed} \times 60$

$= \frac{x-y}{x} \times 60$

Variety Questions

Q.1. A man travels 80 km in three hours. He further travels for two more hours. Find the distance travelled in the latter two hours, if his average speed for the entire journey is 30 km/h.

Group D 17/08/2022 (Evening)

(a) 70 km (b) 150 km

(c) 120 km (d) 90 km

Q.2. For a trip of 800 km, a truck travels the first 300 km at a speed of 50 km/h. At what speed should it cover the remaining distance, so that the average speed is 60 km/h?

Group D 22/08/2022 (Morning)

(a) 72 km/h (b) $\frac{600}{13}$ km/h

(c) 52 km/h (d) $\frac{750}{11}$ km/h

Q.3. A person has to cover a distance of 8 km in 1 hour. If he covers one-fourth of the distance in one-third of the total time, then what should his speed (in km/h) be to cover the remaining distance in the remaining time so that the person reaches the destination exactly on time?

Group D 23/08/2022 (Afternoon)

(a) 6 (b) 7 (c) 8 (d) 9

Q.4. A train is moving from north to south direction. It overtakes Raj and Madhur who are walking in the same

direction at the rate of 2 km/h and 4 km/h in 9 sec and 10 sec, respectively. If the train is x metres long, find the value of x.
Group D 25/08/2022 (After)
(a) 90 (b) 30 (c) 50 (d) 70

Q.5. A thief saw a policeman from a distance of 150 m. The thief immediately started running at a speed of 13 km/h and the policeman chased him at a speed of 14 km/h. Find the distance between them after running for 6 minutes.
Group D 26/08/2022 (Afternoon)
(a) 75 m (b) 50 m (c) 100m (d) 125m

Q.6. A and B started moving at the same time towards each other from points X and Y, respectively. After meeting on the way, A and B took 5.4 hours and p hours, respectively to reach Y and X, respectively. If the speed of B is 50% more than that of A, then what is the value of p?
Group D 02/09/2022 (Afternoon)
(a) 2.7 (b) 1.8 (c) 2.4 (d) 3.6

Q.7. The speed of a bus increases by 4 km/h after every two hours. If the bus covers a distance of 80 km in the first two hours, then the total distance covered by the bus in 10 hours will be:
Group D 17/09/2022 (Morning)
(a) 440 km (b) 480 km
(c) 460 km (d) 470 km

Q.8. Let Chennai and Trivandrum be two stations 690 km apart. A train starts from Chennai at 8:00 p.m. and travels towards Trivandrum at a speed of 75 km/h. Another train starts from Trivandrum at 9:00 p.m. and travels towards Chennai on the parallel track at a speed of 60 km/h. At what time will they meet?
Group D 18/09/2022 (Evening)
(a) 01:43:20 a.m. (b) 01:03:40 a.m.
(c) 01:23:30 a.m. (d) 01:33:20 a.m.

Q.9. When a man travels equal distances at speeds of V_1 and V_2 km/h, his average speed is 5 km/h. But when he travels at these speeds for equal time periods, his average speed is 5.5 km/h. Find the positive difference between the two speeds(km//h).
Group D 20/09/2022 (Morning)
(a) $\sqrt{11}$ (b) $\sqrt{10}$ (c) 10 (d) 11

Q.10. The diameter of a wheel is 63 cm. What is the distance covered by the wheel by making 100 revolutions ?
[Use $\Pi = \frac{22}{7}$]
Group D 26/09/2022 (Evening)
(a) 28 m (b) 198 m (c) 99 m (d) 396 m

Q.11. Train A leaves station M at 6.00 a.m. and reaches station N at 2.00 p.m. on the same day. Train B leaves station N at 8.00 a.m. and reaches station M at 3.00 p.m. on the same day. Find the time when Trains A and B meet.
Group D 06/10/2022 (Morning)
(a) 11.00 a.m. (b) 10.48 a.m.
(c) 10.45 a.m. (d) 10.55 a.m.

Q.12. Ramen leaves his home every day 7 : 40 am and reaches his office at 9 : 46 am. One day, he left his home at 7 : 40 am but travelled one-fourth of the distance at $\frac{6}{7}$ of the usual speed and the rest of the distance at $\frac{6}{5}$ of the usual speed. At what time did Ramen reach office on that day ?
NTPC CBT II Level 5 (12/06/2022) Shift 2
(a) 9 : 45 : 40 am (b) 9 : 35 : 30 am
(c) 9 : 25 : 50 am (d) 9 : 30 : 55 am

Q.13. Four friends P, Q, R, and S run around a circular track of length 400 m starting at the same point at the same time at speeds of 4, 8,16 and 20 m/s, respectively. If all of them are moving in the same direction, after how much time would they meet for the first time ?
NTPC CBT II Level 3 (14/06/2022) Shift 2
(a) 100 s (b) 120 s (c) 145 s (d) 90 s

Q.14. A train covered a certain distance at a uniform speed. If the train had been 12 km/h faster, it would have taken 8 hours less than the scheduled time. If the train were slower by 12 km/h, the train would have taken 12 hours more than the scheduled time. Find the length of the journey(in km).
NTPC CBT II Level 5 (15/06/2022) Shift 3
(a) 1440 (b) 2860 (c) 2880 (d) 1480

Q.15. A bus cover four successive 12km stretches at 20kmph, 40kmph, 60kmph and 120kmph respectively. Its average speed (in kmph) over this distance is :
NTPC CBT II Level 2 (16/06/2022) Shift 1
(a) 40 (b) $\frac{100}{9}$ (c) 50 (d) $\frac{200}{9}$

Q.16. Excluding stoppages, the speed of a bus is 45 kmph and including stoppages, it is 27 kmph. For how many minutes does the bus stop per hour ?
NTPC CBT II Level 2 (16/06/2022) Shift 3
(a) 40 mins (b) 36 mins
(c) 20 mins (d) 24 mins

Q.17. A student walks from his house at 2.5 km/hour and reaches his school 6 minutes after school time. Next day he increases his speed by 1 km/hour and reaches his school 6 minutes before school time. How far is the school from his house ?
NTPC CBT II Level 3 (17/06/2022) Shift 2
(a) 2.5 km (b) 1.75 km
(c) 2.25 km (d) 2 km

Q.18. Two buses start from opposite points towards each other on a main road, 185 km apart. The first bus runs for 35 km and takes a right turn and runs for 17 km. It then turns left and runs for another 42 km and takes the direction back to reach the main road, in the meantime, due to a minor breakdown, the other bus has run only 36 km along the main road. What would the distance between the two buses be at this point?
NTPC CBT - I 28/12/2020 (Morning)
(a) 72 km (b) 75 km (c) 80 km (d) 85km

Q.19. A train is travelling 50% faster than a bus. Both start from Karnal at the same time and reach Panipat, which is 75 km from Karnal at the same time. On the way however the train stopped at a station for about 12.5 minutes. The speed of the bus is:
NTPC CBT - I 07/01/2021 (Evening)
(a) 100 Km/h (b) 120 Km/h
(c) 110 Km/h (d) 130 Km/h

Q.20. Moving along a circular path Ansh takes 18 minutes to complete one round and Siddhi takes 12 minutes for the same. If they start from the same point at the same time, then after what time they will meet again at the starting point?
NTPC CBT - I 07/01/2021 (Evening)
(a) 6 minutes (b) 1.5 minutes
(c) 36 minutes (d) 216 minutes

Q.21. A train started with 450 passengers. At the first stop, $\frac{1}{9}$ of them got down and 20 new passengers got in. At the second stop: $\frac{1}{6}$ of the passengers existing got down and 19 new passengers boarded. With how many passengers did the train arrive at the third stop?
NTPC CBT - I 09/01/2021 (Evening)
(a) 420 (b) 400 (c) 369 (d) 394

Q.22. A student reaches school on his bicycle in $\frac{3}{2}$ hours at a speed of 3 km/h. On his return journey he rests for half an hour, and takes a route which is 1 km shorter. What should be the percentage

increase in speed of his cycle so that he reaches home at the same time.
NTPC CBT - I 10/01/2021 (Evening)
(a) $16\frac{2}{3}$% (b) 37% (c) 35% (d) 30.5%

Q.23. Car A is twice as fast as car B, and Car B is thrice as fast as Car C. The distance covered by Car C in 60 minutes will be covered by car B in..
NTPC CBT - I 13/01/2021 (Evening)
(a) 25 minutes (b) 16 minutes
(c) 20 minutes (d) 18 minutes

Q.24. A carriage driving in a fog passed a man who was walking at the speed of 3 km/h in the same direction. He could see the carriage for 4 min and it was visible to him up to a distance of 100 m. What was the speed of the carriage?
NTPC CBT - I 25/01/2021 (Morning)
(a) 4.5 km/h (b) 5.5 km/h
(c) 5 km/h (d) 6 km/h

Q.25. A man travels 360 km in 4 h, partly by air and partly by train. If he had travelled all the way by air, he would have saved $\frac{4}{5}$ of the time he travelled by train, and he would have arrived at his destination 2 h early. Find the distance he travelled by air?
NTPC CBT - I 28/01/2021(Morning)
(a) 270 km (b) 280 km
(c) 290 km (d) 260 km

Q.26. How many poles will be covered by a train in 4 hours if the train is running at a speed of 45 Km/h, given that the poles on the railway track are 50 m apart and the train crosses a pole at the beginning of its journey?
NTPC CBT - I 01/02/2021 (Evening)
(a) 3606 (b) 3636 (c) 3600 (d) 3601

Q.27. A train service got disrupted due to an accident after a travel of 30 km. The speed was reduced to four-fifth to the original speed. This caused it a delay of 45 min. If the accident had happened 18 km farther, it would have been running late for 36 min. What was the original speed of the train?
NTPC CBT - I 02/02/2021 (Evening)
(a) 30 km/h (b) 60km/h
(c) 50km/h (d) 40km/h

Q.28. A, B and C all start their journey from the same place and all three follow the same route. However, A travels at a speed of 60 km/h, B at a speed of 75 km/h and C at a speed of 80 km/h. Also , A starts the journey five hours before B does. If B and C both overtake A at the same instance while traveling, how much time after A did C start the journey?
NTPC CBT - I 10/02/2021 (Evening)
(a) 6 hours 15 minutes
(b) 6 hours 30 minutes
(c) 6 hours 25 minutes
(d) 6 hours 12 minutes

Q.29. A train starts at a speed of 40 km/h . Its speed increases every 1 h by 20 km/h. How much time does it take to cover a distance of 470 km?
NTPC CBT - I 01/03/2021 (Morning)
(a) 6 h 30 min (b) 4h 30 min
(c) 5h 30 min (d) 6 h

Q.30. A locomotive engine without any wagon can go at a speed of 50 km per hour and its speed diminishes by a quantity which varies as the square root of the number of wagons attached.If with 25 wagons its speed is 35 km per hour, then what is the greatest number of wagons that can be attached, if the speed is NOT to fall below 11 km per hour?
NTPC CBT - I 07/04/2021 (Morning)
(a) 169 (b) 144 (c) 196 (d) 225

Q.31. Trains P and Q move along parallel tracks in the same direction. Train P completely overtakes the train Q in 60 seconds, and a passenger in the train P crosses train Q in 40 seconds. If the trains have their speeds in the ratio 2: 1, what is the ratio of their lengths?
RRB JE 23/05/2019 (Evening)
(a) 3 : 1 (b) 1 : 2 (c) 3 : 2 (d) 3 : 4

Q.32. In a 200 m race, P beats Q by 35 m or 7 seconds. What is P's time over the course?
RRB JE 24/05/2019 (Morning)
(a) 36 seconds (b) 33 seconds
(c) 40 seconds (d) 47 seconds

Q.33. Two friends start at the same time from cities P and Q towards cities Q and P respectively. After meeting at some point between P and Q, they reach their destinations in 54 and 24 minutes respectively. In what time did the one who moved from Q to P complete his journey?
RRB JE 26/06/2019 (Evening)
(a) 48 minutes (b) 36 minutes
(c) 72 minutes (d) 60 minutes

Q.34. Two trains one from station P to Q, the other from station Q to P start simultaneously with speeds 80 km/h and 95 km/h. If they meet after 12 hours, what is the difference between the distances covered by them ?
RRB JE 28/06/2019 (Evening)
(a) 15 km (b) 2100 km
(c) 180 km (d) 200 km

Q.35. The circumference of a planet is 36,000 km. If the planet does not make any other motion and it takes 20 hours to complete one rotation, then find the speed of a point on its equator?
ALP Tier II 21/01/2019 (Afternoon)
(a) 400 m/s (b) 500 m/s
(c) 200 m/s (d) 300 m/s

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.36. The average speed of Gaurav during a two-way journey is 15 km/h.if he walked a distance of 20 km every hour while going then his speed while returning will be :
Group D 17/08/2022 (Morning)
(a) 11 km/h (b) 15 km/h
(c) 12 km/h (d) 10 km/h

Q.37. Reena reaches a birthday party 20 min late if she walks 3 km/h from her house. If she increases her speed to 4 km/h she would reach 30 min early, then the distance between her house and the venue of the birthday party is
Group D 17/08/2022 (Afternoon)
(a) 9 km (b) 7 km (c) 10 km (d) 4 km

Q.38. A man travelled at a speed of 20 m/min for 100 min, and at a speed of 70 m/min for 50 min. His average speed is
Group D 17/08/2022 (Evening)
(a) 25 m/min (b) 35 m/min
(c) $\frac{110}{3}$ m/min (d) $\frac{70}{3}$ m/min

Q.39. A motor car starts with a speed of 60 km/h and increases its speed after every two hours by 15 km/h. In how much time will it cover a distance of 360 km?
Group D 18/08/2022 (Morning)
(a) 2 hours (b) 9 hours
(c) 7 hours (d) 5 hours

Q.40. A truck travels at a speed of 60 km/h from city P to city Q and returns to city P by the same route at a speed of 100 km/h. What is the average speed of the truck for the given journey?
Group D 18/08/2022 (Morning)
(a) 80 km/h (b) 85 km/h
(c) 70 km/h (d) 75 km/h

Q.41. How many seconds will a boy take to run one complete round around a square field of side 38 metres, if he runs

at a speed of 6 km/h?
Group D 18/08/2022 (Afternoon)
(a) 71.2 (b) 50.1 (c) 61.2 (d) 91.2

Q.42. A car can cover 275 km in 5 hours. If its speed is reduced by 5 km/h, then how much time will the car take to cover a distance of 250 km?
Group D 18/08/2022 (Evening)
(a) 5 hr (b) 5 hr 30 min
(c) 6 hr (d) 4 hr 30 min

Q.43. A starts from X at 9:00 am and reaches Y at 1:00 pm, on the same day. B also starts from Y at 9:00 am and reaches X at 3 pm on the same day, following the same route as A. At what time do the two meet?
Group D 22/08/2022 (Afternoon)
(a)11:24 hrs (b) 11:30 hrs
(c) 10:00 hrs (d) 11:12 hrs

Q.44. The odometer of a car reads 12,000 km at the beginning of the journey and 12,800 km at the end of the journey. If the journey takes 4 hours, find the average speed of the car in m/sec.
Group D 23/08/2022 (Evening)
(a) $\frac{500}{9}$m/sec (b) $\frac{430}{8}$m/sec
(c) $\frac{188}{9}$m/sec (d) $\frac{270}{8}$m/sec

Q.45. Two trains start at the same time from station A and station B with speeds of 60 km/h and 40 km/h respectively towards each other. By the time they meet each other, the faster train has covered a distance of 60 km more than the slower train. What is the distance between the two stations?
Group D 24/08/2022 (Afternoon)
(a) 300 km (b) 420km
(c) 450km (d) 360km

Q.46. Two trains of same length are running on parallel tracks in the same direction at speeds of 56 m/s and 46 m/s. The faster train crosses the slower train in 26 sec. The length of each train is
Group D 25/08/2022 (Morning)
(a) 100 m (b) 120 m (c) 140 m (d) 130 m

Q.47. I walk at a speed of 10 km/h and reach the destination in 2 hrs. If I increase my speed by 5 km/h, how early would I reach my destination?
Group D 25/08/2022 (Evening)
(a) 30 min (b) 40 min
(c) 20 min (d) 50 min

Q.48. A car travels 80 km at the speed of 20 km/h and the next 30 km at the speed of 30 km/h. What is its average speed?
Group D 29/08/2022 (Afternoon)
(a) 22 km/h (b) 20 km/h
(c) 40 km/h (d) 30 km/h

Q.49. A train crosses a platform 90 meters long in 60 seconds at a speed of 54 km/h. Find the time the train will take to cross an electric pole.
Group D 29/08/2022 (Evening)
(a) 58 seconds (b)54 seconds
(c) 48 seconds (d) 60 seconds

Q.50. A car can cover a distance of 25 km per litre of petrol. The driver of the car filled the tank with $5\frac{1}{2}$ litres of petrol. After travelling how much distance (in km) will the car stop?
Group D 29/08/2022 (Evening)
(a) 140.5 (b) 125.5 (c) 135.5 (d) 137.5

Q.51. A 725 m long train passes through a 235 m long tunnel in 48 sec. Find the speed of the train.
Group D 30/08/2022 (Morning)
(a) 82 km/h (b) 72 km/h
(c) 54 km/h (d) 66 km/h

Q.52. Two trains start from P and Q, respectively, at the same time and run towards each other at a speed of 40km/h and 30 km/h, respectively. By the time they meet, the first train has covered 80 km more than the other train. Find the distance between P and Q .
Group D 30/08/2022 (Evening)
(a) 660 km (b) 240 km
(c) 560 km (d) 630 km

Q.53. If John travels a distance of 90 km at a speed of 30 km/h and returns at a speed of 60 km/h, his average speed is:
Group D 01/09/2022 (Morning)
(a) 60 km/h (b) 40 km/h
(c) 45 km/h (d) 30 km/h

Q.54. A train P going at the speed of 70 km/h completely passes train Q of length 170 m going in the same direction on parallel tracks, at 56 km/h, in $1\frac{1}{2}$ minutes. How much time (in seconds) will P take to cross completely train R of length 220 m, going at 74 km/h in the opposite direction?
Group D 01/09/2022 (Afternoon)
(a) 15 (b) 12 (c) 10 (d) 14

Q.55. A 280 m long train overtakes a man moving at a speed of 8 km/h (in the same direction) in 16 seconds. How much time (in seconds) will it take this train to completely cross another
380 m long train, moving in the opposite direction at a speed of 37 km/h?
Group D 01/09/2022 (Evening)
(a) 25 (b) 28 (c) 22 (d) 20

Q.56. A car covers certain distance in 2 $\frac{1}{4}$hours at 36 miles/h and another distance in $1\frac{3}{4}$ hours at 56 miles/h. Find the total distance (in miles) travelled by the car.
Group D 01/09/2022 (Evening)
(a) 179 (b) 139 (c) 200 (d) 159

Q.57. A man has to cover a distance of 150 km in 12 hours. If he covers two-third of this distance in $\frac{5}{8}$ of the time, then what should be his speed (in km/h, correct to one decimal place) to cover the remaining distance in the time left ?
Group D 02/09/2022 (Afternoon)
(a) 11.1 (b) 6.7 (c) 10.5 (d) 11.5

Q.58. A train crosses a telegraph post and a bridge of length 300 metres in 10 seconds and 20 seconds, respectively. Find the speed of the train.
Group D 05/09/2022 (Evening)
(a) 75 km/h (b) 89 km/h
(c) 69.5 km/h (d) 108 km/h

Q.59. A bus covers a distance of 160 km in $3\frac{1}{4}$ hours with one stop of 10 minutes and another stop of 5 minutes during the journey. Find the average speed of the bus.
Group D 06/09/2022 (Afternoon)
(a) $50\frac{1}{3}$ km/h (b) $53\frac{1}{3}$km/h
(c) $52\frac{1}{3}$ km/h (d) $51\frac{1}{3}$ km/h

Q.60. A train overtakes two persons who are walking at 15 m/s and 35 m/s, respectively, in the same direction as that of the train in 20 seconds and 40 seconds, respectively. The length of the train is:
Group D 08/09/2022 (Morning)
(a) 1000 m (b) 900 m
(c) 800 m (d) 700 m

Q.61. A person can complete a journey in 14 hours. He covers one-third of the distance at the rate of 40 km/h and the remaining distance at the rate of 60 km/h. What is the total distance of his journey?
Group D 08/09/2022 (Morning)
(a) 720 km (b) 540 km
(c) 480 km (d) 360 km

Q.62. Train A running at a speed of 63 km/h takes 21 seconds to completely

cross train B running at 45 km/h in the opposite direction. The length of train B is 2.5 times the length of train A. Train B crosses a bridge completely in 76 seconds. The length of the bridge (in m) is:
Group D 08/09/2022 (Afternoon)
(a) 880 (b) 660 (c) 480 (d) 500

Q.63. Two trains M and N cross a pole in 30 seconds and 1 minute 45 seconds, respectively. The length of train M is half the length of train N. The respective ratio of the speed of train M to that of train N is:
Group D 12/09/2022 (Afternoon)
(a) 2 : 3 (b) 7 : 4 (c) 5 : 4 (d) 9 : 4

Q.64. If the speed of a vehicle decreases by 10 km/h, it takes 2 hours more than what it usually takes to cover a distance of 1800 km. The time it usually takes is:
Group D 13/09/2022 (Morning)
(a) 18 hours (b) 10 hours
(c) 17 hours (d) 19 hours

Q.65. A train goes from A to B at a speed of 20 km/h and returns from B to A by the same route at 30 km/h. The average speed (in km/h) of the train during the two-way journey is:
Group D 14/09/2022 (Afternoon)
(a) 24 (b) 25 (c) 22 (d) 23

Q.66. A train travels at an average speed of 30 miles per hour for 2½ hours and then travels at a speed of 60 miles per hour for 1½ hours. The total distance (in miles) covered by the train is_____.
Group D 14/09/2022 (Afternoon)
(a) 90 (b) 180 (c) 165 (d) 135

Q.67. Two trains are moving in opposite directions at speeds of 80 km/h and 120 km/h. The length of one train is 300 m. The time taken by them to cross each other is 12 seconds. The length (in m) of the other train, correct to 2 decimal places, is:
Group D 14/09/2022 (Evening)
(a) 366.67 (b) 388.88
(c) 377.77 (d) 333.33

Q.68. A boy goes to school at a speed of 3 km/h. He returns at a speed of 5 km/h. He takes a total of 4 hours for both going to school and returning. The distance (in km) between his home and school is:
Group D 15/09/2022 (Morning)
(a) 7.2 (b) 7.3 (c) 7.4 (d) 7.5

Q.69. A bus is moving at a speed of 84 km/h. If its speed is reduced by 12%, the new speed of the bus (in km/h) will be:
Group D 17/09/2022 (Evening)
(a) 71.92 (b) 70.92 (c) 72.92 (d) 73.92

Q.70. The distance between two stations, Delhi and Amritsar is 450 km. A train starts at 4 p.m. from Delhi and moves towards Amritsar at an average speed of 60 km/h. Another train starts from Amritsar at 3 : 20 p.m. and moves towards Delhi at an average speed of 80 km/h. At what distance from Delhi will the two trains meet?
Group D 19/09/2022 (Morning)
(a) 170 (b) 180 (c) 160 (d) 165

Q.71. Two trains start at the same time from A and B and proceed towards each other at speeds of 85 km per hour and 105 km per hour, respectively. When they meet, it is found that train from B has travelled 200 km more than the train from A. The distance between A and B is:
Group D 19/09/2022 (Evening)
(a) 1950 km (b) 2000 km
(c) 1800 km (d) 1900 km

Q.72. Two trains 240 m and 320 m long are travelling on parallel tracks in the same direction at speeds of 59 km/h and 50 km/h. How long will it take for the two trains to pass each other from the instant they meet?
Group D 20/09/2022 (Afternoon)
(a) 3 min 44 sec (b) 3 min 24 sec
(c) 2 min 18 sec (d) 2 min 24 sec

Q.73. Babli travelled for 14 hours. If she covered one-fourth of the journey at a speed of 25 km/h and the remaining at 30 km/h, what is the total distance travelled by her?
Group D 22/09/2022 (Morning)
(a) 140 km (b) 400 km
(c) 225 km (d) 340 km

Q.74. A train 400 m long travelling at a speed of 64 km/h crosses another train 720 m long moving in the opposite direction at a speed of 80 km/h. How much time does the second train take to cross a man sitting in the first train?
Group D 22/09/2022 (Afternoon)
(a) 18 sec (b)16 sec (c) 12 sec (d) 15 sec

Q.75. Chakravarty drives a car at a speed of 52 km/h. How much time will he take to cover a distance of 364 km?
Group D 27/09/2022 (Afternoon)
(a) 6 hours (b) 4 hours
(c) 5 hours (d) 7 hours

Q.76. Two trains are running in opposite directions on parallel tracks. If their speeds are 50 km/h and 58 km/h, find their relative speed.
Group D 27/09/2022 (Afternoon)
(a) 20 m/s (b) 40 m/s
(c) 30 m/s (d) 50 m/s

Q.77. Two trains of equal length are running on parallel lines in the same direction at speeds of 36 km/h and 26 km/h. The faster train passes the slower train in 18 seconds. The length of each train is:
Group D 28/09/2022 (Morning)
(a) 50 metres (b) 25 metres
(c) 75 metres (d) 70 metres

Q.78. Mr. X traveled 220 km, 250 km and 140 km at a speed of 11 km/h, 5 km/h and 7 km/h, respectively. Find his average speed in km/h.
Group D 30/09/2022 (Morning)
(a) $7\frac{7}{9}$ (b) $6\frac{5}{9}$ (c) $6\frac{7}{9}$ (d) $6\frac{2}{9}$

Q.79. The average speed of a car for a given 4-hour journey is 60 km/h. If it travels at 65 km/h for the first 2 hours, then the speed of the car in the next 2 hours is:
Group D 30/09/2022 (Afternoon)
(a) 55 km/h (b) 50 km/h
(c) 53 km/h (d) 60 km/h

Q.80. Ravi travels from City A to City B. If Ravi drives his car at two fifth of his normal speed, then he reaches City B 30 minutes late. Find the time (in minutes) that Ravi would have taken to travel from City A to City B if he drove at his normal speed.
Group D 06/10/2022 (Evening)
(a) 18 (b) 22 (c) 15 (d) 20

Q.81. A man traveled a certain distance by bus at the rate of 40 km/h and returned walking at the rate of 5 km/h via the same route. If the two-way journey took him a total of 4 hours 30 minutes, the total distance covered by him in this 4.5 hour was:
Group D 06/10/2022 (Evening)
(a) 25 km (b) 30 km (c) 20 km (d) 40 km

Q.82. Two trains of equal length are running on parallel lines in the same direction at speeds of 46 km/h and 36 km/h. The faster train passes the slower train in 36 seconds. The relative speed of these two trains (in m/s) is:
Group D 11/10/2022 (Afternoon)
(a) $\frac{25}{9}$ (b) $\frac{25}{18}$ (c) $\frac{25}{8}$ (d) $\frac{25}{7}$

RRB NTPC CBT - 2 (09/05/2022 to 17/06/2022)

Q.83. What is the time taken by a 450 m long train running at 54 km/h to cross a

man standing on a platform ?
Level 6 (09/05/2022) Shift 1
(a) 25 seconds (b) 32 seconds
(c) 28 seconds (d) 30 seconds

Q.84. A person covers a certain distance at a certain speed. If he increases the speed by 30%, then he takes 15 minutes less to cover the same distance. Find the time taken by him to cover the distance when travelling at his original speed.
Level 6 (09/05/2022) Shift 1
(a) 1 hour 12 minutes
(b) 1 hour
(c) 1 hour 05 minutes
(d) 1 hour 10 minutes

Q.85. Avra travels from A to B at 74 km/h and returns from B to A through the same route at 111 km/h. What was his average speed during the two-way journey ?
Level 6 (09/05/2022) Shift 2
(a) 92.5 km/h (b) 88.8 km/h
(c) 87.5 km/h (d) 90 km/h

Q.86. A man covers 250 km, 120 km and 50 km at the speed of 50 km/h , k km/h and 25 km/h, respectively. If his average speed for the whole journey is 42 km/h, then what is the value of k ?
Level 4 (10/05/2022) Shift 1
(a) 45 (b) 35 (c) 36 (d) 40

Q.87. A train covers a distance of 57.6 km in 48 minutes. What is its speed in m/s ?.
Level 5 (12/06/2022) Shift 1
(a) 20 (b) 24 (c) 21 (d) 18

Q.88. A train running at 90 km/h crosses an electric pole in 18 seconds and a platform in 65 second. What is the length of the platform ?
Level 5 (12/06/2022) Shift 1
(a) 1175 m (b) 1250 m
(c) 1050 m (d) 1020 m

Q.89. A train 225 m long is running at a speed of 145 km/hr. What is the time (in seconds) in which it will pass a man who starts from the engine running at the speed of 17 km/hr in the direction opposite to that of the train ?
Level 2 (13/06/2022) Shift 1
(a) 4 (b) 5 (c) 6 (d) 7

Q.90. A 265 m long train is running at 61 km/h . In how much time(in seconds) will it cross another train of length 245 m running at 47 km/h in the opposite directions ?
Level 2 (13/06/2022) Shift 1
(a) 17 (b) 15 (c) 19 (d) 14

Q.91. A goods train overtakes two boys who are walking in the same direction in which the train is going at the rate of 5 kmph and 10 kmph and passes them completely in 21 and 24 seconds respectively. What is the length of the goods train (in metres) ?
Level 2 (13/06/2022) Shift 1
(a) $233\frac{1}{3}$ (b) $260\frac{2}{3}$ (c) 180 (d) 210

Q.92. Julie can cover a distance of 140 m in 18 seconds. At that given speed how much distance can Julie cover in 1 hour ?
Level 2 (13/06/2022) Shift 2
(a) 25.2 km (b) 28 km
(c) 31.5 km (d) 29.4 km

Q.93. Vaishali covers a certain distance by car at 50 kmph and returns to the original place through the same route on a bicycle at 10 kmph. If the time taken by her for the whole journey was 2 hours 24 minutes, then what was the total distance that she covered ?
Level 2 (13/06/2022) Shift 2
(a) 48 km (b) 40 km (c) 50 km (d) 60 km

Q.94. At the same time A and B start moving towards each other from two different places, 240 km apart. The ratio of the speeds of A and B is 5 : 7, and the speed of B is 84 km/h . After how many minutes will A and B meet each other ?
Level 3 (14/06/2022) Shift 1
(a) 80 minutes (b) 100 minutes
(c) 120 minutes (d) 90 minutes

Q.95. A train passes a man, going in opposite direction, in 12 seconds and the speed of the man is 10 km/h. If the speed of the train is 62 km/h, then what is the length (in m) of the train ?
Level 3 (14/06/2022) Shift 2
(a) 240 (b) 200 (c) 220 (d) 250

Q.96. A train crosses a one km long bridge in one minute and a 750 m long tunnel in 50 seconds. Assuming that the train is running at a uniform speed, what is its speed ?
Level 3 (14/06/2022) Shift 2
(a) 81 km/h (b) 90 km/h
(c) 72 km/h (d) 108 km/h

Q.97. The ratio of the speeds of a bus and car is 7 : 11 . if the car covers a distance of 396 km in 6 hours. What is the speed of the bus in km/h ?
Level 5 (15/06/2022) Shift 1
(a) 42 (b) 35 (c) 38.5 (d) 45.5

Q.98. A car covers a certain distance at a speed of 45 km/h and returns to the starting point following the same path at a speed of 36 km/h. Find the average speed for the entire journey(in km/h).
Level 5 (15/06/2022) Shift 2
(a) 40 (b) 38 (c) 42 (d) 35

Q.99. Travelling at $\frac{7}{8}$ of his usual speed, Ansh covered a distance of 35 km in 50 minutes. What will be Ansh's usual speed in km/h ?
Level 5 (15/06/2022) Shift 2
(a) 54 (b) 60 (c) 48 (d) 64

Q.100. A train running at the speed of 95 km/h crosses a pole in 18 seconds. What is the length of the train in meters ?
Level 5 (15/06/2022) Shift 3
(a) 475 m (b) 465 m (c) 455 m (d) 480 m

Q.101. Suhas travelled by train to cover $\frac{5}{12}$ of the journey, and then travelled by bus to cover $\frac{1}{3}$ of the journey. After that he travelled the remaining 36 km on a bicycle . How much in all did Suhas travel?
Level 5 (15/06/2022) Shift 3
(a) 168 km (b) 132 km
(c) 150 km (d) 144 km

Q.102. The ratio of the speed of A and B is 4 : 5 and hence A takes 20 minutes more than the time taken by B to reach the destination. If A had walked at double his speed, he would have covered the distance in:
Level 2 (16/06/2022) Shift 2
(a) 40 min (b) 50 min
(c) 80 min (d) 100 min

Q.103. Akshita covers a distance of 300 km at the speed of 50km/h, then 360 km at 30km/h and another 420 km at 60 km/h. If her average speed for the whole journey is k km/h, then how much time (in hours) will she take to cover 216 km at k km/h ?
Level 2 (16/06/2022) Shift 2
(a) 5 hours (b) 7 hours
(c) 6 hours (d) 4 hours

Q.104. A 360 m train crosses an electric pole in 12 seconds. Find the time (in seconds) taken by the train to cross a 150 m long bridge.
Level 2 (16/06/2022) Shift 2
(a) 24 (b) 21 (c) 18 (d) 17

Q.105. Two trains start at the same time from two stations and proceed towards each other at 30 km/h and 35 km/h, respectively . When they meet, it is found that one train has covered 30 km more

than the other. Find the distance between the two stations.
Level 2 (16/06/2022) Shift 3
(a) 390 km (b) 400 km
(c) 410 km (d) 380 km

Q.106. Madhvi started her journey at 9 : 25 am and covered 24% of the distance by 9 : 39 : 24 am. At what time will she reach her destination if she continues at the same speed ?
Level 3 (17/06/2022) Shift 1
(a) 10 : 25 am (b) 10 : 20 am
(c) 10 : 15 am (d) 10 : 30 am

Q.107. Ravi travels from City A to City B and from City B to City A in 4 hours. If the average speed of the total journey is 68.3 km/h, what is the distance between City A and City B ?
Level 3 (17/06/2022) Shift 1
(a) 136.6 km (b) 273.2 km
(c) 197.6 km (d) 152.7 km

Q.108. Rakesh travels in a car at 50 km/h for 2 hours, on a bike at 35 km/h for 2 hours, and in a train at 100 km/h for 4 hours. Find average speed during the journey ?
Level 3 (17/06/2022) Shift 2
(a) 75 km/h (b) 72.50 km/h
(c) 71.25 km/h (d) 74 km/h

Q.109. In covering a distance of 60 km, Arjun takes 2 hours more than Rohit. If Arjun doubles his speed, then he would take 1 hour less than Rohit. Arjun's original speed is:
Level 3 (17/06/2022) Shift 3
(a) 15 km/h (b) 25 km/h
(c) 5 km/h (d) 10 km/h

RRB NTPC CBT - 1 (28/12/2020 to 31/07/2021)

Q.110. A train leaves station A towards station B at the speed of 50 km/hr. After half an hour, another train leaves station B towards station A at 150 km/hr. The distance between the stations is 725 km. The distance of the point from station A where the two trains are to meet is
RRB NTPC 28/12/2020 (Morning)
(a) 250 km (b) 150 km
(c) 168 km (d) 200 km

Q.111. A train running at a speed of 60 km/h crossed a pole in 1.5 min. The length of the train (in m) is
RRB NTPC 29/12/2020 (Evening)
(a) 1500 (b) 600 (c) 800 (d)1200

Q.112. Parshotam and Anjilka started moving in opposite directions from the same place at a speed of 30 km/h and 3.5 km/h respectively. How far will they be from each other after 2.5 h?
RRB NTPC 30/12/2020 (Morning)
(a) 66.25 km (b) 8.75 km
(c) 75 km (d) 83.75 km

Q.113. A man travels a distance of 420 km by train which moves at 75 km/h and returns back by car with a speed of 50 km/h. Find his average speed of the whole journey?
RRB NTPC 30/12/2020 (Evening)
(a) 68 km/h (b) 65 km/h
(c) 66 km/h (d) 60 km/h

Q.114. Train A, running at the speed of 80 km/hr crossed train B, running at the speed of 70 km/hr in the opposite direction. Both trains cross each other in 30 seconds. If the length of train A is 300 m, then the length of train B is
RRB NTPC 04/01/2021 (Morning)
(a) 850 m (b) 750 m (c) 950 m(d) 855 m

Q.115. Driving his car at a speed of 30 km/h, Vinod reaches his office 5 min late. If his speed is 40 km/h, he reaches the office 3 min early. Find the distance he travels between his residence and his office.
RRB NTPC 04/01/2021 (Evening)
(a) 16 Km (b) 20 Km (c) 15 Km (d) 18 Km

Q.116. Two cars start from Ahmedabad and run in opposite directions with one car's speed being 200 km/h more than the other. If they are 4500 km apart after 9h, than the sum of the speeds of both the cars is
RRB NTPC 04/01/2021 (Evening)
(a) 500 Km/h (b) 350 Km/h
(c) 250 Km/h (d) 150 Km/h

Q.117. A bus passes two persons moving in the direction of the moving bus at a speed of 3 km/h and 5 km/h, respectively. The bus passes the first person in 10s and the second person in 11s. The speed of the bus is
RRB NTPC 05/01/2021 (Morning)
(a) 27 km/h (b) 25 km/h
(c) 24 km/h (d) 28 km/h

Q.118. Two men Start travelling from the same place in the same direction at the rate of 5 Km/h and 5.5 Km/h respectively. To be 8.5 km apart from each other, the time taken by them is:
RRB NTPC 07/01/2021 (Morning)
(a) 16h 15 min (b) 17 h
(c) 4 h 15 min (d) 8 h 30 min

Q.119. A student takes 1.5 hours from home to school at a speed of 5 km/h. By what percent should he increase his speed to reduce the time by 20% and cover the same distance from school to home?
RRB NTPC 08/01/2021 (Morning)
(a) 25% (b) 16% (c) 20% (d) 15%

Q.120. A train covers 400 km at a uniform speed. If the speed had been 10 km/h more, it would have taken 2 hour less for the same journey. Find the speed of the train?
RRB NTPC 08/01/2021 (Evening)
(a) 40 km/h (b) 50 km/h
(c) 55 km/h (d) 45 km/h

Q.121. In a 200 m race, Shruti runs at the speed of 4 km/h. Shruti gives a start of 18 m to Veena and still beats her by 30s. What is Veena's speed?
RRB NTPC 09/01/2021 (Evening)
(a) 4.36 km/h (b) $\frac{24}{7}$ km/h
(c) $\frac{7}{24}$ km/h (d) 3.12 km/h

Q.122. Rohan can travel from Delhi to Kanyakumari in 30 h. If he reduced his speed to $\frac{1}{15}th$. He will go 10 km less in the same time. His speed is :
RRB NTPC 12/01/2021 (Morning)
(a) 2.5 km/h (b) 8 km/h
(c) 5 km/h (d) 3 km/h

Q.123. Ram is at A and Shyam is at B. They proceed towards each other simultaneously. After meeting each other in the way Ram takes 2 h to reach B and Shyam takes 8 h to reach A. If the speed of Ram is 40 km/h, the speed of Shyam is
RRB NTPC 13/01/2021 (Morning)
(a) 30 km/h (b) 25 km/h
(c) 20 km/h (d) 35 km/h

Q.124. Two trains, going in opposite directions, start at the same time from two stations that are 250 km apart. The trains meet each other at a distance of 130 km from one of the stations. Find the ratio of their speeds.
RRB NTPC 13/01/2021 (Evening)
(a) 13 : 12 (b) 12 : 11 (c) 9 : 8 (d) 15 : 14

Q.125. P, Q and R are on a trip by a car. P drives during the first hour at an average speed of 40 km/h. Q drives during the next 2 hours at an average speed of 50 km/h . R drives for the next 3 hours at an average speed of 60 km/h. If they reached their destination after exactly 6 hours, then find their average speed approximately.
RRB NTPC 16/01/2021 (Morning)
(a) 45.25 km/h (b) 53.33 km/h
(c) 50.23 km/h (d) 61.35 km/h

Q.126. If a man travels from A to B at a speed of 50 km/h and returns by increasing his speed by 40%, then find his average speed (to 2 decimal places) for both trips.
RRB NTPC 16/01/2021 (Morning)
(a) 55.34 km/h (b) 58.33 km/h
(c) 47. 28 km/h (d) 62.35 km/h

Q.127. A salesman has to cover 6 km in $\frac{3}{4}$ h. If he covers $\frac{1}{2}$ of the distance in $\frac{2}{3}$ of the total time, then what must be his speed (in km/h) to cover the remaining distance in the remaining time.
RRB NTPC 17/01/2021 (Morning)
(a) 8 (b) 15 (c) 6 (d) 12

Q.128. Two trains are running in the same direction with the speeds of 32 km/h and 26km/h respectively from X and Y. If X is 42 km away from Y and if they meet at a point Z beyond Y, then the distance from Y and Z will be..
RRB NTPC 17/01/2021 (Morning)
(a) 182 km (b) 236 km
(c) 165 km (d) 148 km

Q.129. A bus moving at the speed of 45 Km/h overtakes a truck 150m ahead, going in the same direction in 30 sec. The speed of the truck is:
RRB NTPC 17/01/2021 (Evening)
(a) 25 km/h (b) 27 km/h
(c) 24 km/h (d) 20 km/h

Q.130. Excluding stoppage stations, the speed of a train is 60 km/h and including stoppage stations it travels at a speed of 45 km/h. For how many minutes does the train stop per hour?
RRB NTPC 18/01/2021 (Evening)
(a) 30 min (b) 10 min
(c) 20 min (d) 15 min

Q.131. If a man travels at a speed of 15 km/h instead of travelling at a speed of 9km/h, he travels 30 km more. The actual distance travelled by him is.
RRB NTPC 18/01/2021 (Evening)
(a) 45 km (b) 43 km (c) 42 km (d) 41 km

Q.132. A map of a city is drawn on a scale of 1 : 50000. The distance between two cities A and B on this map is 12 cm. What will be the actual distance between the two cities?
RRB NTPC 19/01/2021 (Evening)
(a) 15 km (b) 12 km (c) 6 km (d) 9 km

Q.133. If a train runs at an average speed of 42 km/h, then it covers a certain distance in 45 min. What is the speed at which the train must run to reduce the time of the same journey to 35 min?
RRB NTPC 21/01/2021 (Morning)
(a) 49 km/h (b) 54 km/h
(c) 52 km/h (d) 52.5 km/h

Q.134. A certain distance (d) is covered by a cyclist at a certain speed. If a jogger covers half the distance in double the time(t), then the ratio of the speed of the cyclist to the speed of the jogger is.
RRB NTPC 21/01/2021 (Evening)
(a) 2 : 1 (b) 4 : 1 (c) 3 : 4 (d) 1 : 2

Q.135. Sohan and Mohan start from the school with a speed of 3.5 km/hr and 4 km/h . What time will they take to be 1.5 km apart if they start in the same direction?
RRB NTPC 22/01/2021 (Morning)
(a) 9 min (b) 3 hours (c)1 hour (d)12 min

Q.136. Ravikant cycles at a speed of 12.5 km/h and walks at a speed of 3 km/h. To cover a distance of 40 km by cycle and walk both, Ravikant took 7 hours. How many of these hours were spent cycling?
RRB NTPC 23/01/2021 (Evening)
(a) 4 (b) 5 (c) 2 (d) 3

Q.137. A thief steals a bag from the car at 3 pm and drives away at a speed of 50 km/h. The thief is located at 4 p.m. and the owner sets off in his car at a speed of 70 km/h. When will he catch the thief?
RRB NTPC 23/01/2021 (Evening)
(a) 6 : 30 pm (b) 8 : 00 pm
(c) 6 : 00 pm (d) 8 : 45 pm

Q.138. Two trains start at the same time from two stations and proceed towards each other at the speeds of 20 km/h and 25 km/h respectively. When they meet, it is found that one train has travelled 80 km more than the other. Find the distance between the two stations.
RRB NTPC 25/01/2021 (Morning)
(a) 720 km (b) 700 km
(c) 730 km (d) 710 km

Q.139. If a motor car travels the first half of a distance at a speed of 30 km/h and the remaining half distance at a speed of 50 km/h, what will be its average speed?
RRB NTPC 27/01/2021 (Morning)
(a) 37.5 km/h (b) 45 km/h
(c) 40 km/h (d) 37 km/h

Q.140. Two trains start from Delhi and Patna, and travel towards Patna and Delhi, respectively. After passing each other, they take 4 h 48 min and 3 h 20 min to reach Patna and Delhi, respectively. If the train starting from Delhi is moving at a speed of 45 km/h, then find the speed of the other train.
RRB NTPC 27/01/2021 (Evening)
(a) 55 km/h (b) 50 km/h
(c) 54 km/h (d) 52 km/h

Q.141. A man covers a certain distance between his house and his office on a scooter. At an average speed of 30 km/h, he is late by 10 min. However, at a speed of 40 km/h he reaches his office 5 min earlier. Find the distance between his house and his office.
RRB NTPC 27/01/2021 (Evening)
(a) 30 km (b) 35 km (c) 20 km (d) 40 km

Q.142. A 300m long train crosses an electric pole in 5 s. Find the speed of the train?
RRB NTPC 28/01/2021(Morning)
(a) 220 km/h (b) 200 km/h
(c) 218 km/h (d) 216 km/h

Q.143. A train passes two bridges of length 600 m and 200 m in 80s and 40s respectively. The length of the train is :
RRB NTPC 29/01/2021 (Morning)
(a) 220 m (b) 250 m
(c) 180 m (d) 200 m

Q.144. A car completes a journey in 18 h covering the first half of the journey at a speed of 40 Km/h and the second half of the journey at a speed of 50 Km/h. Find the distance of the journey?
RRB NTPC 29/01/2021 (Morning)
(a) 800 km (b) 810 km
(c) 850 km (d) 700 km

Q.145. Find the time taken by a 450 m long train travelling at the speed of 80 km/h to cross a platform of length 150 m
RRB NTPC 30/01/2021 (Morning)
(a) 25 s (b) 27 s (c) 28 s (d) 24 s

Q.146. A man travelled a distance of 28 km in 8 h. He travelled partly by foot at a speed of 2 km/h and partly on bicycle at a speed of 6 km/h. What was the distance (in km) travelled on foot ?
RRB NTPC 30/01/2021 (Evening)
(a) 16 (b) 18 (c) 10 (d) 12

Q.147. Parvez leaves his office everyday at 6 pm and reaches home at 7:30 pm. One day he left his office at 6 pm but travelled one fourth of the distance at $\frac{4}{5}$ of the usual speed. At how many times his normal speed did Parvez travel the remaining part of the journey if he managed to reach home on time?
RRB NTPC 31/01/2021 (Morning)
(a) $\frac{12}{11}$ (b) $\frac{10}{9}$ (c) $\frac{16}{15}$ (d) $\frac{6}{5}$

Q.148. A started a journey at 1:00 p.m. at a speed of 40 km/h. B started from the same spot and in the same direction at 1:40 pm at a speed of 50 Km/h. How many minutes will B take to catch up with A?
RRB NTPC 31/01/2021 (Evening)
(a) 150 min (b) 120 min
(c) 140 min (d) 160 min

Q.149. P can run 250 m in 25 s and Q can run the same distance in 30 s. By what distance is P ahead of Q after 4.5 s, if both start the race at the same time.
RRB NTPC 31/01/2021 (Evening)
(a) 6.9 m (b) 8.4 m (c) 9.6 m (d) 7.5 m

Q.150. A car can go 150 km with 20 L of petrol. How far (in km) can it go with 30 L of petrol?
RRB NTPC 01/02/2021 (Morning)
(a) 200 (b) 175 (c) 160 (d) 225

Q.151. Two persons A and B start a journey from the same point at speed 3 Km/h and 4 Km/h respectively. If they move in the same destination, then what will be the distance between them after 6h
RRB NTPC 02/02/2021 (Morning)
(a) 9 Km (b) 3 Km (c) 4 Km (d) 6 Km

Q.152. A man travelled from a school to a park at a speed of 20Km/h and walked back at a speed of 5 km/h. If the whole journey took 5 hr. Find the distance of the school from the park ?
RRB NTPC 03/02/2021 (Morning)
(a) 40 Km (b) 80 Km (c) 30 Km (d) 20 Km

Q.153. A train that is 110 m in length is running at 90 km/h. How much time will the train take to cross a bridge that is 180 m in length?
RRB NTPC 03/02/2021 (Evening)
(a) 11.6 s (b) 9.6 s (c) 10.6 s (d) 7.6 s

Q.154. What is Ram's average speed if he goes from Point X to Point Y at 8 km/h and returns from point Y to Point X at 12 km/h?
RRB NTPC 03/02/2021 (Evening)
(a) 8.6 km/hr (b) 10.6 km/hr
(c) 9.6 km/hr (d) 15.6 km/hr

Q.155. A dog saw a cat at a distance of 280 m. The cat at once ran with the speed of 10 km/h and the dog also ran to catch it with the speed of 24 km/h. How much time will the dog take to catch the cat ?
RRB NTPC 04/02/2021 (Evening)
(a) 1.3 min (b) 1.2 min
(c) 1.4 min (d) 1.5 min

Q.156. A man completes a journey in 11 h. He travels the first half of the journey at the speed of 25 km/h and the second half at the speed of 30 km/h. Find the total distance of the journey.
RRB NTPC 04/02/2021 (Evening)
(a) 300 km (b) 265 km
(c) 250 km (d) 285 km

Q.157. Two men start walking together to a certain destination, one at the speed of 3 Km/h and another at the speed of 3.75 Km/h. The latter arrives half an hour before the former. The distance is:
RRB NTPC 09/02/2021 (Morning)
(a) 6.7 m (b) 0.7 km (c) 7.5 km (d) 7.0 km

Q.158. Two women walk from a place at the speeds of 6 km/h and 8 km/h respectively. First woman takes 40 min more than the second one to cover the distance. Find the distance.
RRB NTPC 09/02/2021 (Evening)
(a) 14 km (b) 16 km (c) 12 km (d) 10 km

Q.159. A cycle takes 13 h to cover a certain distance. He travels the first half of the distance at a speed of 7 km/h and the second half at a speed of 6 km/h. Find the distance.
RRB NTPC 09/02/2021 (Evening)
(a) 84 km (b) 82 km (c) 80 km (d) 86 km

Q.160. The diameter of a bullock cart wheel is $\frac{14}{11}m$. This wheel makes ten complete revolutions per minute.What will be the speed of the cart in km/h?
RRB NTPC 10/02/2021 (Morning)
(a) 4.8 (b) 8.8 (c) 9.6 (d) 2.4

Q.161. If 1 cm on a map represents 9 km of actual distance , then how many km of actual distance will 2 cm on the same map represent?
RRB NTPC 10/02/2021 (Morning)
(a) 22 (b) 18 (c) 12 (d) 16

Q.162. Walking at $\frac{5}{6}$ of her usual speed Anita took 2 minutes more than usual to reach the bus terminus. How long does Anita take to reach the terminus on days that she isn't late?
RRB NTPC 10/02/2021 (Morning)
(a) 12 minutes (b) 10 minutes
(c) 9 minutes (d) 8 minutes

Q.163. A man travelled from a village to a post-office at a speed of 25 km/h and walked back at a speed of 4 km/h. If the whole journey took 5 hours 48 minutes, then the distance of the post-office from the village is:
RRB NTPC 10/02/2021 (Evening)
(a) 40 km (b) 20 km (c) 40 m (d) 20 m

Q.164. An aeroplane flies along the sides of an equilateral triangle at the speed of 300 km/h, 200 km/h and 240 km/h, respectively. The average speed of the plane while flying around the triangle is....
RRB NTPC 11/02/2021 (Morning)
(a) 150 km/h (b) 240 km/h
(c) 140 km/h (d) 40 km/h

Q.165. A train is travelling at the rate of 45 km/h. How many seconds it will take to cover a distance of $\frac{4}{5}$km,
RRB NTPC 11/02/2021 (Evening)
(a) 64 seconds (b) 36 seconds
(c) 9 seconds (d) 124 seconds

Q.166. A and B walk around a circular path of 10 km in circumference, starting together from the same point in the same direction. If their speeds are 3 km/h and 2 km/h respectively, after how many hours will they be again at the starting point?
RRB NTPC 15/02/2021 (Morning)
(a) 10 h (b) 2 h (c) 5 h (d) 3 h

Q.167. Two trains of length 200 m and 400 m run on parallel lines. When they run in the same direction, it takes 30 seconds for the train with the higher speed to overtake the other train, and when they travel in the opposite directions, it takes them 6 seconds to cross each other. What are the speeds (in km/h) of the two trains?
RRB NTPC 15/02/2021 (Morning)
(a) 216 and 144 (b) 190 and 260
(c) 184 and 144 (d) 280 and 140

Q.168. The ratio between the speeds of two trains is 7 : 5. If the second train runs 400 km in 4 h, then the speed of the first train is:
RRB NTPC 16/02/2021 (Evening)
(a) 140 km/h (b) 148 km/h
(c) 145 km/h (d) 142 km/h

Q.169. The speed of a bullet train is 35% more than that of an electric train. If the electric train takes 3 h 45 min for a fixed distance, what will be the time taken by the bullet train to cover the same distance?
RRB NTPC 16/02/2021 (Evening)
(a) $2\frac{7}{9}$h (b) $12\frac{7}{9}$h (c) $2\frac{5}{9}$h (d) $7\frac{2}{9}$h

Q.170. An express train traveled at an average speed of 100 km/h, stopping for 3 min after every 75 km. How much time did it take the express train to travel 600 km ?
RRB NTPC 17/02/2021 (Morning)

(a) 370 min (b) 308 min
(c) 384 min (d) 381 min

Q.171. Rohan had to travel from A to B. He covered 75% of the distance at a speed of 60km/h and the remaining distance at a speed of 40 km/h. What was his average speed for the entire journey?
RRB NTPC 17/02/2021 (Evening)
(a) 50 km/h (b) $54\frac{2}{3}$ km/h
(c) $53\frac{1}{3}$ km/h (d) 55 km/h

Q.172. Vinod traveled from his home to his office at a speed of 20 km/h and walked back at a speed of 5 km/h. The whole journey took 4 h. The distance between his office and his home is:
RRB NTPC 22/02/2021 (Evening)
(a) 10km (b) 6 km (c) 16 km (d) 8 km

Q.173. A and B start simultaneously from point X and go towards point Y. X and Y are 60 km apart. A's speed is 4km/h less than of B. B after reaching Y, returns and meets A at a point 12 km away from Y Find the speed of A.
RRB NTPC 27/02/2021 (Morning)
(a) 16km/h (b) 20km/h
(c) 8km/h (d) 12km/h

Q.174. A train covers a distance of 12 km in 25 minutes. If its speed is decreased by 5 km/hr, then the time (in minutes) taken by it to cover the same distance will be:
RRB NTPC 27/02/2021 (Evening)
(a) $30\frac{3}{119}$ (b) $30\frac{31}{119}$
(c) $30\frac{32}{119}$ (d) $30\frac{30}{119}$

Q.175. An air jet covers a certain distance at a speed of 144 km/hr in 5 hours. To cover the same distance in 2 hours, what is the required speed of the air jet ?
RRB NTPC 27/02/2021 (Evening)
(a) 365 km/hr (b) 370 km/hr
(c) 360 km/hr (d) 350 km/hr

Q.176. The ratio of the speeds of a car, a train and a bus is 4 : 7 : 3. The average of the speeds of the car, the bus and the train is 70km/h. What is the average of the speeds of the car and the train?
RRB NTPC 01/03/2021 (Evening)
(a) 82.5 km/h (b) 81.5 km/h
(c) 83 km/h (d) 81 km/h

Q.177. A person desires to reach his destination, 84 km away, in 4 h. For the first half of the distance, his speed was 28 km/h. What should his speed be for the rest of the distance?
RRB NTPC 02/03/2021 (Evening)
(a) $16\frac{1}{5}$ km/h (b) $16\frac{2}{5}$ km/h
(c) $16\frac{4}{5}$ km/h (d) 16 km/h

Q.178. A train passes two persons who are walking in the opposite direction of the train at the rates of 4m/s and 10m/s in 10 seconds and 8 seconds respectively. What is the speed of the train?
RRB NTPC 03/03/2021 (Morning)
(a) 15 m/s (b) 20 m/s
(c) 40 m/s (d) 10 m/s

Q.179. A scooterist travels for 5 h, the first half of the distance at 21 km/h, and the rest at 24 km/h. Find the distance traveled.
RRB NTPC 03/03/2021 (Evening)
(a) 56 km (b) 224 km
(c) 225 km (d) 112 km

Q.180. A man covered a distance of 32 km. After 1 hour 20 minutes he noticed that the distance he covered is $\frac{5}{7}$th of the remaining distance. What was his speed in km/hr?
RRB NTPC 04/03/2021 (Morning)
(a) 24 km/hr (b) 16 km/hr
(c) 12 km/hr (d) 10 km/hr

Q.181. Ramu can reach a certain place in 30 hours.If he reduces his speed by $\frac{1}{15}$ th, he goes 10 km less in that time. Find his speed.
RRB NTPC 05/03/2021 (Evening)
(a) 4 km/h (b) 6 km/h
(c) $5\frac{1}{2}$km/h (d) 5 km/h

Q.182. Suhas can cover the distance between point A and point B in 7 hours. If he travels at an average speed of 104 km/h. He travelled for the first four hours at an average speed of 118 km/h. What should be his average speed for the rest of the journey if he wants to reach his destination in a total time of 8 hours from the start of the journey?
RRB NTPC 05/03/2021 (Evening)
(a) 70 km/h (b) 60 km/h
(c) 64 km/h (d) 72 km/h

Q.183. A train covers a distance of 35 km in 60 minutes .How long will it take to cover 105 km?
RRB NTPC 07/03/2021 (Evening)
(a) 120 min (b) 180 min
(c) 140 min (d) 90 min

Q.184. A 100-m long train passes an electric post in 6 seconds. The speed of the train is:
RRB NTPC 08/03/2021 (Morning)
(a) 60 km/h (b) $60\frac{1}{6}$km/h
(c) $16\frac{1}{6}$km/h (d) 50 km/h

Q.185. Two boys Rishi and Vamsi start at the same time to ride from Lucknow to Kanpur that is 95 km away. Rishi travels 5 km/h slower than Vamsi. Vamsi reaches Kanpur and immediately starts to travel back. On his return journey he meets Rishi, who is 25 km away from Kanpur. Find Rishi's speed.
RRB NTPC 08/03/2021 (Evening)
(a) 8 km/h (b) 5 km/h
(c) 7 km/h (d) 6 km/h

Q.186. A bus travelling with $\frac{5}{7}$ of its actual speed covers 42 km in 1h 40 min 48 s. Find the actual speed of the bus.
RRB NTPC 09/03/2021 (Morning)
(a) 30 km/h (b) 35 km/h
(c) $17\frac{6}{7}$ km/h (d) 25 km/h

Q.187. Ramu goes to his college from his house at a speed of 2 km/h and returns at a speed of 3 km/h. If he takes 5 h in going and coming, the distance between his house and college is:
RRB NTPC 09/03/2021 (Morning)
(a) 7.5 km (b) 6 km (c) 5 km (d) 7 km

Q.188. How many minutes will Chandu take to cover a distance of 600 m, if he runs at a speed of 30 km/h?
RRB NTPC 09/03/2021 (Evening)
(a) $1\frac{2}{5}$min (b) $1\frac{1}{5}$min
(c) $2\frac{2}{5}$min (d) $2\frac{1}{5}$min

Q.189. If Seenu covers a distance of 15.5 km in 5 hours, then the distance covered by him in 6 hours is:
RRB NTPC 09/03/2021 (Evening)
(a) 17.6 km (b) 16.6 km
(c) 19.6 km (d) 18.6 km

Q.190. A bus and a car start from points x and y respectively and travel towards each other at the speed of 60 km/h and 50 km/h respectively. By the time they meet, the bus has travelled 50 km more than the car. What is the distance between x and y?
RRB NTPC 11/03/2021 (Morning)
(a) 450 km (b) 500 km

(c) 600 km (d) 550 km

Q.191. Swapna travels by car equal distances with the speeds of 10 km/h,15 km/h and 20km/h takes a total of 65 min. The total distance travelled by her (in km) is:
RRB NTPC 11/03/2021 (Morning)
(a) 10 (b) 15 (c) 12 (d) 20

Q.192. Two cyclists start from the same place and go in opposite directions. One goes towards the north at the speed of 14 km/h and the other goes towards the south at 21 km/h. How long do they take to be 43.75 km apart?
RRB NTPC 11/03/2021 (Evening)
(a) 95 min (b) 85 min
(c) 105 min (d) 75 min

Q.193. P can run 300 m in 20 s and Q can run the same distance in 30 s. By what distance is P ahead of Q after 4 s, if both start the race at the same time?
RRB NTPC 12/03/2021 (Morning)
(a) 40 m (b) 60 m (c) 30 m (d) 20 m

Q.194. A person covers a distance of 8 km in 56 minutes. If he covers half of the distance in two-third of the total time, then what should his speed (in km/h) be to cover the remaining distance in the remaining time?
RRB NTPC 12/03/2021 (Morning)
(a) $12\frac{6}{7}$ (b) $12\frac{5}{7}$ (c) $2\frac{6}{7}$ (d) $12\frac{4}{7}$

Q.195. Two men start together walking to a certain destination, one at the speed of 3 km/h and another at the speed of 3.75km/h. The later arrives half an hour before the former, the distance is:
RRB NTPC 12/03/2021 (Evening)
(a) 9.5 (b) 8 (c) 7.5 (d) 6

Q.196. A train, when moves at an average speed of 40km/h, reaches its destination on time. When its average speed becomes 35km/h then it reaches its destination 15 min late. Find the distance.
RRB NTPC 12/03/2021 (Evening)
(a) 30 km (b) 80 km (c) 40 km (d) 70 km

Q.197. Mohan goes to school 5 days a week and the distance between his home and school is 5 km. On all these 5 days, after school he goes to the market which is at a distance of 3 kms from the school, and then from the market he walks 2.5 kms to reach his home. The remaining 2 days of the week, Mohan walks an average of 20 kms. How many kms does Mohan walk in a week?
RRB NTPC 13/03/2021 (Evening)
(a) 113.5 km (b) 93.5 km
(c) 72.5 km (d) 92.5 km

Q.198. Two men start walking together to a certain destination, one at the speed of 6 km/h, and the other at 7.5 km/h. The latter arrives 1 h 4 min before the former. The distance covered is:
RRB NTPC 14/03/2021 (Evening)
(a) 38 km (b) 44 km (c) 32 km (d) 24 km

Q.199. Walking at the rate of 3km/h a man covers a certain distance in 8 hours.If the man runs at a speed of 16 km/h, then how much time will he take to cover the same distance?
RRB NTPC 15/03/2021 (Morning)
(a) 2 hours (b) 2.5 hours
(c) 1.5 hours (d) 1 hour

Q.200. Anupam and Vineet standing together started running in opposite direction on 2 km long circular racing track. They ran at the speeds of 9 km/h and 11 km/h respectively. After how much time will they meet on the track?
RRB NTPC 15/03/2021 (Evening)
(a) 6 min (b) 12 min (c) 10 min (d) 20 min

Q.201. A man travels non-stop over a certain distance at an average speed of 60 km/h. With stoppages his speed reduces to 50 km/h. How many minutes per hour does he stop?
RRB NTPC 21/03/2021 (Morning)
(a) 15 minutes (b) 10 minutes
(c) 12 minutes (d) 8 minutes

Q.202. A person travelled 120 km by steamer, 450 km by train and 60 km by horse. It took 13 h 30 min. If the speed of the train is 3 times that of the horse and 1.5 times that of the steamer, find the speed of the train.
RRB NTPC 21/03/2021 (Evening)
(a) 65 km/h (b) 64 km/h
(c) 60 km/h (d) 62 km/h

Q.203. Two runners cover the same distance at the speed of 15 km/h and 16 km/h respectively. Find the distance travelled when one takes 16 min longer than the other.
RRB NTPC 21/03/2021 (Evening)
(a) 63 km (b) 64 km (c) 62 km (d) 60 km

Q.204. A car travels a distance of 300 km at a uniform speed. If the speed of the car is 5 km/h more, it takes 2 h less to cover the same distance. Find the original speed of the car.
RRB NTPC 27/03/2021 (Morning)
(a) 20 km/h (b) 25 km/h
(c) 30 km/h (d) 24 km/h

Q.205. A man drives 300 km from A to B in 3 hours 20 minutes. He returns the same distance in 4 hours 10 minutes. The average speed from A to B exceeds the average speed for the entire trip by _____ km/h.
RRB NTPC 01/04/2021 (Evening)
(a) 8 (b) 5 (c) 9 (d) 10

Q.206. Amritsar Shatabdi Express leaves Delhi at 4 : 30 p.m. and reaches Amritsar at 10 : 30 p.m. The average speed of the train is 75 km/h. What is the distance from Delhi to Amritsar?
RRB NTPC 05/04/2021 (Evening)
(a) 500 km (b) 400 km
(c) 550 km (d) 450 km

Q.207. Sachin and Anil start at the same time riding from Chandigarh to Kalka that is 50 km away from Chandigarh. Sachin travels 6 km an hour slower than Anil. Anil reaches Kalka, and immediately embarks on the journey back to Chandigarh. He meets Sachin 20 km from Kalka. Find Sachin's speed.
RRB NTPC 05/04/2021 (Evening)
(a) 4.9 km/h (b) 5.1 km/h
(c) 4.5 km/h (d) 5.0 km/h

Q.208. A man travelling in a train notices that he can count 21 telephone posts in 1 min. If the poles are 50 m apart ,then at what speed is the train travelling?
RRB NTPC 07/04/2021 (Evening)
(a) 50 km/h (b) 21 km/h
(c) 60 km/h (d) 65 km/h

Q.209. Two cars leave city A at 8 : 30 am and 8 : 45 am respectively for city B. The cars move at a speed of 45 km/h and 54 km/h respectively. How many kilometers away from city A will the two cars be together?
RRB NTPC 08/04/2021 (Evening)
(a) 67.5 (b) 45 (c) 40.5 (d) 55.2

Q.210. A man completes 30 km of a journey at 6 km/hr and the remaining 40 km of the journey in 5 hr. His average speed for the whole journey is:
RRB NTPC 23/07/2021 (Evening)
(a) 8 km/hr (b) $6\frac{4}{11}$ km/hr
(c) 7 km/ hr (d) 5 km/hr

Q.211. Two trains are moving in opposite directions with the speeds of 60 km/h and 25 m/s respectively. What will be the speed of the second train with respect to a man sitting in the first train?
RRB NTPC 24/07/2021 (Morning)
(a) 35 km/h (b) 30 km/h
(c) 150 km/h (d) 85 km/h

Q.212. A train takes 15s to pass completely through a station platform 50 m long and 10 s through another station platform 20 m long. Find the length of the train.
RRB NTPC 24/07/2021 (Evening)
(a) 35 m (b) 40 m (c) 50 m (d) 60 m

Q.213. The radius of a wheel is 70 cm. If the wheel makes 10 revolutions in 5 seconds covering a certain distance then the speed of the wheel is
RRB NTPC 26/07/2021 (Morning)
(a) 36.25km/hr (b) 29.46km/hr
(c) 32.72km/hr (d) 31.68km/hr

Q.214. Two trains, 145 m and 155 m in length, run on Parallel tracks. One train runs at the speed of 32 km/h and the other at 40 km/h. When both trains run in opposite direction, then the time required for them to cross each other completely from the moment they meet is:
RRB NTPC 26/07/2021 (Morning)
(a) 15 sec (b) 10 sec
(c) 12 sec (d) 20 sec

Q.215. If a woman covers a distance of $10\frac{1}{5}$km in 3 hours, then find the distance covered by her in 5 hours.
RRB NTPC 31/07/2021 (Morning)
(a) 17 km (b) 12 km (c) 13 km (d) 15 km

Q.216. A man takes 5 h 45 min for walking to a certain place and riding back. He would have gained 2 h by riding both the ways. The time he will take to walk both the ways is:
RRB NTPC 31/07/2021 (Evening)
(a) 11 h 45 min (b) 11 h 30 min
(c) 7 h 30 min (d) 7 h 45 min

Q.217. Satish takes a car on rent at 2:00 p.m. and drives it at the speed of 75 km/h towards a Resort Palm Beach , 800 km away from his house. He calls his neighbor Raman at 3:00 p.m. to join him at the resort. Raman immediately sets off in another car using the same route as Satish, at the speed of 90 km/h, towards the resort. When will Raman catch up with Satish?
RRB NTPC 31/07/2021 (Evening)
(a) 8 p.m. (b) 9 p.m.
(c) 7 p.m. (d) 8:30 p.m.

RRB JE (22/05/2019 to 28/06/2019)

Q.218. A bus leaves Agra at 5 AM and reaches Delhi at 12 noon. Another bus leaves Delhi at 8 AM and reaches Agra at 3 PM. At what time do they meet?
RRB JE 22/05/2019 (Afternoon)
(a) 11:30 AM (b) 1:30 PM
(c) 9:30 AM (d) 10 AM

Q.219. Time taken for a journey is 50 minutes at 48 km/h speed. What should be the speed, if the journey time is reduced by 10 minutes?
RRB JE 22/05/2019 (Afternoon)
(a) 60 km/h (b) 80 km/h
(c) 42 km/h (d) 76 km/h

Q.220. The radius of a circular wheel is $\frac{7}{4}$ m. How many revolutions does the wheel make to cover 22 km?
RRB JE 22/05/2019 (Afternoon)
(a) 100 (b) 2000 (c) 4000 (d) 1000

Q.221. A man walks from P to Q at the rate of 5 km/h and returns from Q to P at 3 km/h. What is his average speed for the whole journey?
RRB JE 22/05/2019 (Evening)
(a) 3.5 km/h (b) 8 km/h
(c) 3.75 km/h (d) 3.25 km/h

Q.222. Buses come out of a bus terminus in intervals of 10 minutes at 20 km/h. A man coming from the opposite direction towards the terminus meets the buses at intervals of 8 minutes. What is his speed?
RRB JE 22/05/2019 (Evening)
(a) 4 km/h (b) 5 km/h
(c) 3.75 km/h (d) 6 km/h

Q.223. A train 120 m long crosses a platform of length 100 m in 10 seconds. What is its speed?
RRB JE 22/05/2019 (Evening)
(a) 100 km/h (b) 79.2 km/h
(c) 72 km/h (d) 80 km/h

Q.224. Two places-P and Q are 400 miles apart. A car starts from P at a speed of 50 mph towards Q, After 75 minutes, another car starts from Q to P at a speed of 40 mph. At what time will the cars meet?
RRB JE 23/05/2019 (Afternoon)
(a) 4 hours 30 minutes
(b) 5 hours
(c) 4 hours
(d) 2 hours 45 minutes

Q.225. How long does a train 110 m long running at a speed of 72 km/h take to cross a bridge 132 metres in length?
RRB JE 23/05/2019 (Afternoon)
(a) 12.42 seconds (b) 12.1 seconds
(c) 9.8 seconds (d) 14.3 seconds

Q.226. In covering a certain distance, two persons travel at speeds in the ratio 18 : 12. What is the ratio of the time taken by them?
RRB JE 23/05/2019 (Evening)
(a) 2 : 5 (b) 2 : 3 (c) 2 : 1 (d) 3 : 2

Q.227. Two trains are moving in opposite directions at 60 km/hr and 90 km/hr. Their lengths are 1.10 km and 0.9 km respectively. What is the time taken by the slower train to cross the faster train in seconds?
RRB JE 24/05/2019 (Afternoon)
(a) 36 seconds (b) 48 seconds
(c) 49 seconds (d) 45 seconds

Q.228. Travelling at $\frac{3}{4}$ of the normal speed, a person reaches his workplace 15 minutes late. How many minutes does he take usually to reach the workplace?
RRB JE 24/05/2019 (Evening)
(a) 30 minutes (b) 42 minutes
(c) 45 minutes (d) 60 minutes

Q.229. Around a circular track of 120 m, P and Q start running simultaneously from the same point in the same direction at 20 m/min and 12 m/min. At how many points will they meet?
RRB JE 24/05/2019 (Evening)
(a) 4 (b) 2 (c) 1 (d) 3

Q.230. Two trains 200 m and 150 m long are running on parallel tracks at the rates of 40 km/h and 45 km/h respectively. In how much time will they cross each other if they are running in the same direction?
RRB JE 25/05/2019 (Morning)
(a) 72 seconds (b) 132 seconds
(c) 192 seconds (d) 252 seconds

Q.231. Two stations A and B are 110 km apart on a straight line. One train starts from A at 7 a.m. and travels towards B at 20 km/h. Another train starts from B at 8 a.m. and travels towards A at a speed of 25 km/h. At what time will they meet?
RRB JE 25/05/2019 (Evening)
(a) 11 a.m. (b) 9 a.m.
(c) 10 a.m. (d) 10.30 a.m.

Q.232. Ratio of speeds of two vehicles is 7 : 8. If the second vehicle covers 400 km in 5 hours, what is the speed of the first vehicle?
RRB JE 26/05/2019 (Morning)
(a) 70 km/h (b) 75 km/h
(c) 85 km/h (d) 65 km/h

Q.233. A boatman covers a distance of 24 km against water current and 36 km along the water current and takes 6 hours each time. Find the speed of water

current.
RRB JE 26/05/2019 (Afternoon)
(a) 1 km/h (b) 2 km/h
(c) 3 km/h (d) 4 km/h

Q.234. A train moving with a speed 54 km/h crosses a platform and a man on the platform in 36 seconds and 20 seconds respectively. How long is the platform?
RRB JE 26/05/2019 (Afternoon)
(a) 180 m (b) 240 m (c) 270 m (d) 300 m

Q.235. A person travels from P to Q at a speed of 50 km/h for 30 minutes. He then increases his speed to 60 km/h and reaches his destination R in 20 minutes. What is his average speed for the whole journey?
RRB JE 26/05/2019 (Evening)
(a) 65 km/h (b) 55 km/h
(c) 54 km/h (d) 70 km/h

Q.236. Two trains of equal lengths take 10 seconds and 15 seconds respectively to cross a telegraph post. If the length of each train is 120 m, in what time will they cross each other traveling in the opposite direction?
RRB JE 27/05/2019 (Afternoon)
(a) 12 seconds (b) 10 seconds
(c) 20 seconds (d)15 seconds

Q.237. Two motorists travelling in opposite directions meet at some point in between. After this they take 9 and 16 hours to reach their respective destinations. What is the ratio of their speeds?
RRB JE 28/05/2019 (Morning)
(a) 5 : 4 (b) 4 : 7 (c) 4 : 3 (d) 5 : 3

Q.238. A man takes twice as long to go upstream as to row downstream. What is the ratio of speed of boat in still water and the speed of stream?
RRB JE 28/05/2019 (Afternoon)
(a) 2 : 1 (b) 3 : 1 (c) 3 : 2 (d) 4 : 1

Q.239. P and Q run around a circular track of 240m at 15m/min and 20 m/min speeds respectively. If they start running simultaneously, after what time will they meet again at the starting point?
RRB JE 29/05/2019 (Morning)
(a) 25 minutes (b) 36 minutes
(c) 30 minutes (d) 48 minutes

Q.240. Two trains 100 m and 120m in length are moving in opposite direction, with speeds 18 m/s and 15 m/s respectively. In what time will they cross each other?
RRB JE 30/05/2019 (Morning)
(a) 6.7 seconds (b) 10 seconds
(c) 7.2 seconds (d) 8 seconds

Q.241. A 270 m long train running at a speed of 120 km/h crosses another train running in opposite direction at the speed of 80 km/h in 9 seconds. What is the length of the other train?
RRB JE 30/05/2019 (Afternoon)
(a) 230 m (b) 260 m (c) 240 m (d) 280 m

Q.242. Two girls travel in opposite directions, the former from 'A' at a speed of 25 km/h and takes 20 hours to reach her destination 'B'. The latter from 'B' takes 25 hours to reach her destination 'A' meeting the former on her way. What is the latter's speed?
RRB JE 31/05/2019 (Evening)
(a) 20 km/h (b) 25 km/h
(c) 18 km/h (d) 15 km/h

Q.243. A train 125 m long passes a man, running at 5 km/hr in the same direction in which the train is going, in 10 seconds. What is the speed of the train?
RRB JE 01/06/2019 (Morning)
(a) 55 km/h (b) 45 km/h
(c) 54 km/h (d) 50 km/h

Q.244. A train moving at 40 km/h will take 2 hours 15 minutes more to cover a certain distance when the speed is doubled. What is the distance?
RRB JE 01/06/2019 (Afternoon)
(a) 160 km (b) 200 km
(c) 220 km (d) 180 km

Q.245. A cyclist goes from a place P to Q; first at 4 km/h and later at 5 km/h in 1 hour 24 minutes altogether. If the distances covered in the first and second part of the journey are in the ratio 2: 1, when did the cyclist change his speed after start?
RRB JE 01/06/2019 (Afternoon)
(a) 30 minutes (b) 45 minutes
(c) 24 minutes (d) 1 hour

Q.246. P and Q jog along a circular track of 400 m in opposite directions from the same starting point starting together, with speeds 10 m/s and 40 m/s. Whenever they meet, P's speed is doubled and Q's speed is halved. After what time from start, will they meet for the third time?
RRB JE 01/06/2019 (Evening)
(a) 28 seconds (b) 36 seconds
(c) 18 seconds (d) 26 seconds

Q.247. A train takes 2 hours less for a journey of 300 km by increasing its speed by 5 km/h. What is its normal speed?
RRB JE 01/06/2019 (Evening)
(a) 25 km/h (b) 20 km/h
(c) 35 km/h (d) 30 km/h

Q.248. A and B take part in a 100 m race. A runs at 5 km/hr. A gives B a start of 8 m and still beats him by 8 seconds. Find the speed of B.
RRB JE 02/06/2019 (Afternoon)
(a) 5.15 km/hr (b) 4.14 km/hr
(c) 4.20 km/hr (d) 4.25 km/hr

Q.249. Walking at 4 mph, a person covers a certain distance in a given time. If he increases his speed to 9 mph, he covers 7.5 miles more in the same time. How much distance does he cover originally?
RRB JE 02/06/2019 (Evening)
(a) 7.5 miles (b) 6.5 miles
(c) 6 miles (d) 5 miles

Q.250. A train 360 m long is running at a speed of 45 km/h. In what time will it pass a bridge of 140 m long?
RRB JE 26/06/2019 (Evening)
(a) 45 seconds (b) 42 seconds
(c) 40 seconds (d) 48 seconds

Q.251. A cart runs at the rate of 4 km/h for the first 10 km and at 2 km/h for the second 10 km. Find the average speed of the cart in km/h.
RRB JE 27/06/2019 (Morning)
(a) 2.67 km/h (b) 3.33 km/h
(c) 2 km/h (d) 5.54 km/h

Q.252. A and B walk along a circular path in opposite directions with speeds of 2 rounds per hour and 3 rounds per hour respectively. If they start at the same time from the same point at 8 AM, how many times will they cross each other by 9:30AM?
RRB JE 27/06/2019 (Evening)
(a) 6 (b) 7 (c) 4 (d) 5

Q.253. If the speed is reduced by 25% of the usual speed, the time taken for a journey is 2 hours more. What is the time taken, if the journey is done at the usual speed?
RRB JE 27/06/2019 (Evening)
(a) 5.5 hours (b) 4.5 hours
(c) 6 hours (d) 5 hours

Q.254. Two trains are running in opposite directions with the same speed. If the length of each train is 120 m, and they cross each other in 12 seconds, then find the speed of each train.
RRB JE 28/06/2019 (Evening)
(a) 18 km/h (b) 72 km/h
(c) 36 km/h (d) 10 km/h

RRB ALP Tier - 2

(21/01/2019 to 08/02/2019)

Q.255. Two trains start running at the same time. Train A travels from city M to city N while traveling at an average speed of 54 km/h, while train B travels from city N to city M. The distance between the two cities is 960 km. If both the trains cross each other after 8 hours, then find the average speed (in km/hr) of train B?
ALP Tier II 21/01/2019 (Afternoon) ,
(a) 66 (b) 72 (c) 60 (d) 76

Q.256. Due to engine failure, an express train runs at $\frac{9}{10}$ of its normal speed and reaches at 2:34 pm instead of 2:28 pm. At what time did he start walking?
ALP Tier II 21/01/2019 (Afternoon)
(a) 1:40 pm (b) 1:32 p.m.
(c) 1:34 pm (d) 1:36pm

Q.257. A pilgrim covered a distance of 50 km in 7.5 hours. He covered some distance by walking at the speed of 4 km/hr and some distance by sitting on the bullock cart which was running at the speed of 12 km/hr. The distance covered by walking is _____ km.
ALP Tier II 21/01/2019 (Afternoon)
(a) 24 (b) 20 (c) 30 (d) 26

Q.258. If a person walks from his home to office at 80% of his usual speed, he is late by 18 minutes. What is the usual time taken by him to cover the same distance with his usual speed?
ALP Tier II 21/01/2019 (Evening)
(a) 70 minutes (b) 78 minutes
(c) 75 minutes (d) 72 minutes

Q.259. An object covers the first distance of 30m in 5s and takes 3s for the next distance of 30m. What is the average speed of the object?
ALP Tier II 21/01/2019 (Evening)
(a) 6.5 m/s (b) 7.5 m/s
(c) 9.0 m/s (d) 4.5m/s

Q.260. Two trains start moving towards each other at a distance of 2000 metres. The first train moves at a speed of 20m/s and the second at a speed of 30m/s. After how many seconds do they meet each other?
ALP Tier II 21/01/2019 (Evening)
(a) 40 (b) 50 (c) 35 (d) 45

Q.261. What is the distance covered by a bus running at a speed of 72 km/h in 5 seconds?
ALP Tier II 21/01/2019 (Evening)
(a) 200 m (b) 100 m
(c) 400 m (d) 50 m

Q.262. X runs a total of 7.5 km in a day. If he runs $\frac{25}{6}$ km in the morning, how much does he run in the evening?
ALP Tier II 21/01/2019 (Evening)
(a) $\frac{5}{3}$ Km (b) $\frac{10}{3}$ Km
(c) $\frac{11}{3}$ Km (d) $\frac{8}{3}$Km

Q.263. Two cars, X and Y travel from A to B at an average speed of 50 km/hr and 75 km/hr respectively. If X takes 2 hours more than Y in this journey, then the distance between A and B is ____ km.
ALP Tier II 23/01/2019 (Morning)
(a) 300 (b) 800 (c) 600 (d) 400

Q.264. A bullet travels a distance of 90 m in 0.2 sec. Find its speed in km/hr.
ALP Tier II 23/01/2019 (Morning)
(a) 125 (b) 1,620 (c) 162 (d) 1,250

Q.265. A train running at a speed of 64 km/h takes 50 min to cover a certain distance. By how much should its speed (in km/h) be increased to cover the same distance in 40 minutes?
ALP Tier II 23/01/2019 (Afternoon)
(a) 80 (b) 16 (c) 25 (d) 10

Q.266. Two car , A and B, start from city C to city D. If the distance between the two cities is 540 km and the slower car traveling at an average speed of 90 km/hr takes one hour longer than the faster one, then the faster Find the speed (in km/hr) of the car.
ALP Tier II 23/01/2019 (Afternoon)
(a) 108 (b) 99 (c) 117 (d) 126

RPF Constable (17/01/2019 to 19/02/2019)

Q.267. A train takes 27 seconds to cross the signal at one end of the 650 m long bridge. If that train takes 92 seconds to cross that bridge, then find the length of that train. (In meters)
RPF Constable 17/01/2019 (Morning)
(a) 270 (b) 250 (c) 240 (d) 260

Q.268. A train runs with a speed of 33 m/s and It will cross a signal in 11 seconds. Then Find the length of the train. (In meters)
RPF Constable 17/01/2019 (Morning)
(a) 363 (b) 353 (c) 373 (d) 343

Q.269. A train takes 40 seconds to cross the signal at one end of a bridge of 650 m long. If the train crosses the bridge in 105 seconds , then find the length of the train. (In meters)
RPF Constable 17/01/2019 (Evening)
(a) 420 (b) 400 (c) 430 (d) 410

Q.270. A train takes 39 seconds to cross a signal which is at one end of the bridge whose length is 740 m long. If train takes 113 seconds to cross the bridge, find the length of the train.
RPF Constable 18/01/2019 (Morning)
(a) 370 m (b) 290 m (c) 390 m (d) 270 m

Q.271. A person rides at $(\frac{7}{8})$th of the usual speed and he reaches the destination 22 minutes late than the usual time. Find the usual time taken.
RPF Constable 18/01/2019 (Morning)
(a) 144 mins (b) 154 mins
(c) 124 mins (d) 164 mins

Q.272. A train takes 33 seconds to cross the signal at one end of the 650 m long bridge. If that train takes 98 seconds to cross that bridge, then the length of the train (in meters) is drawn.
RPF Constable 18/01/2019 (Afternoon)
(a) 330 (b) 340 (c) 310 (d) 320

Q.273. A train running at 27 meters per second takes only 8 seconds to cross a sign board. Find out the length of the train.
RPF Constable 19/01/2019 (Morning)
(a) 146m (b) 246m (c) 216m (d) 166m

Q.274. One person rides at the rate of ($\frac{5}{6}$) of normal speed and it reaches the destination 33 minutes later than normal time. Find the usual time taken.
RPF Constable 19/01/2019 (Morning)
(a) 165 minutes (b) 150 Minutes
(c) 75 minutes (d) 100 Minutes

Q.275. A train takes 23 seconds to cross the signal at one end of the bridge with a length of 260 meters. If the train takes 49 seconds to cross the bridge then find the length of the train.
RPF Constable 19/01/2019 (Morning)
(a) 270m (b) 330m (c) 230m (d) 430m

RPF S.I. (19/12/2018 to 16/01/2019)

Q.276. The ratio of time taken by Binoy and Cairo to cover a distance of 1000 km is 15 : 16. Find the ratio of their speeds.
RPF S.I. 19/12/2018 (Morning)
(a) 16:15 (b) 12:13 (c) 14:17 (d) 19:18

Q.277. A man travels around an equilateral triangular field at the speeds of 20 kmph, 24 kmph and 30 kmph. Find the average speed of travel?
RPF S.I. 19/12/2018 (Morning)
(a) 28kmph (b) 24kmph
(c) 30kmph (d) 32kmph

Q.278. The worker covers a certain distance walking $(\frac{6}{7})$ of her normal speed and takes 14 minutes more than the normal time taken by her. Calculate the normal time taken ?
RPF S.I. 19/12/2018 (Morning)
(a) 48 minutes
(b) 1 hour 12 minutes
(c) 1 hour 24 minutes
(d) 60 minutes

Q.279. A man cycling at the speed of 20 kmph reaches the college 9 minutes late from the hostel. Had he cycled at 24 kmph, he would have reached 8 minutes earlier. Find the distance between the hostel and the college?
RPF S.I. 19/12/2018 (Morning)
(a) 34km (b) 36km (c) 28km (d) 26km

Q.280. A man cycling at a speed of 24 kmph reaches college 11 minutes late, if he had cycled at a speed of 30 kmph, he would have reached 8 minutes earlier. Find the distance between the hostel and the college?
RPF S.I. 19/12/2018 (Evening)
(a) 24 km (b) 28 km (c) 38 km (d) 36 km

Q.281. The ratio of time taken by Caro and David to cover a distance of 1000 km is 13 : 21. Find the ratio of their speeds.
RPF S.I. 19/12/2018 (Evening)
(a) 21:13 (b) 13:22 (c) 13:21 (d) 22:13

Q.282. A man travels along the sides of an equilateral triangular field at the speeds of 36 km/h, 30 km/h and 45 km/h. Find his average speed.
RPF S.I. 24/12/2018 (Morning)
(a) 45 km/h (b) 36 km/h
(c) 20 km/h (d) 30 km/h

Q.283. A train takes 61 seconds to cross a bridge 408 m long. If the same train takes 27 seconds to cross a sign board, then find the length of the train?
RPF S.I. 24/12/2018 (Morning)
(a) 294 m (b) 384 m
(c) 256 m (d) 324 m

Q.284. A person travels from the hostel to the college with a speed of 15 kmph from the bicycle and reaches a 4.5 minute delay. If he runs a bike with a speed of 20 kmph, then it reaches 4.5 minutes early. Describe the distance between hostel and college. (In km)
RPF S.I. 05/01/2019 (Morning)
(a) 8 (b) 6 (c) 9 (d) 7

Q.285. A train takes 57 seconds to cross the 204 m long bridge. If the same train takes 23 seconds to cross a signal board, tell the length of the train. (In meters)
RPF S.I. 05/01/2019 (Morning)
(a) 138 (b) 128 (c) 118 (d) 148

Q.286. Sheila walks at the speed (20/21) of her usual speed and determines a clear distance in six minutes more than the time it takes in normal speed. Calculate the normal time it takes in determining a certain distance.
RPF S.I. 05/01/2019 (Morning)
(a) 130 (b) 120 (c) 140 (d) 150

Q.287. A person goes to the college with a speed of 45 km/hr from the hostel and gets 5 minutes late. If he runs a bike at 60 kmph then reaches 4 minutes early. Find the distance between the hostel and the college.
RPF S.I. 06/01/2019 (Morning)
(a) 23 km (b) 27km (c) 25 km (d) 35 km

Q.288. A man travels along the sides of an equilateral triangular field at the speeds of 12 km/h, 24 km/h and 20 km/h. Calculate his average speed.
RPF S.I. 06/01/2019 (Afternoon)
(a) 14.33 km/h (b) 13.33 km/h
(c) 15.33 km/h (d) 12.33 km/h

Q.289. Sheila walking at $(\frac{15}{16})$ of her usual speed can cover a certain distance in 6 minutes more than the time taken by her at usual speed. Calculate the usual time taken by him to cover the certain distance?
RPF S.I. 06/01/2019 (Afternoon)
(a) 84 minutes (b) 86 minutes
(c) 88 minute (d) 90 minutes

Q.290. A train crosses a 238 m long platform in 51 seconds. If the same train takes 17 seconds to cross a sign board, find the length (In meters) of the train.
RPF S.I. 06/01/2019 (Afternoon)
(a) 119 (b) 117 (c) 120 (d) 118

Q.291. If a man goes cycling from hostel to college at a speed 15 km/h more than usual speed, he gets late by 2 minutes. If he rides the bicycle at a speed 20 km/h more than usual speed, he arrives 2 minutes early. Calculate the distance (in km) between hostel and college.
RPF S.I. 06/01/2019 (Afternoon)
(a) 4 (b) 3 (c) 2 (d) 1

Q.292. A train takes 52 seconds to cross the 204 m long bridge. If the same train takes 18 seconds to cross a board, then tell the length of the train. (In meters)
RPF S.I. 10/01/2019 (Morning)
(a) 109 (b) 108 (c) 106 (d) 107

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018

Q.293. A Train leaves Kazipet at 5 a.m. and reaches Bangalore at 3 p.m. Another train leaves Bangalore at 7 a.m. and reaches Kazipet at 5p.m. When do the two trains meet? Assume that the trains travels at equal uniform speeds.
RRB ALP 09/08/2018 (Evening)
(a) 11 a.m. (b) 10 a.m.
(c) 12 noon (d) 1 p.m.

Q.294. Peter belongs to Town A and Paul belongs to Town B. They start their journeys towards each other's towns following the same route at the same time. They meet somewhere on the way and continue with their journeys. After meeting Paul, Peter takes another 13.5 hours to reach his destination while Paul takes another 6 hours to reach Peter's town. If Peter travelled at the speed of 30 km/h, what was Paul's speed in km/h?
RRB ALP 13/08/2018 (Afternoon)
(a) 42.5 (b) 45 (c) 40 (d) 47.5

Q.295. Kishan cycled a distance of 120 km at a certain speed. If he cycled 2 km slower every hour, he would have taken 3 more hours to reach his destination. What is the speed in km/h at which Kishan actually cycled?
RRB ALP 14/08/2018 (Evening)
(a) 12 (b) 10 (c) 8 (d) 15

Q.296. A person driving at the speed of 40 km/hr reaches office 1 minute early while he reaches 3 minutes late if driving at 36 km/hr. What is the distance (in km) that she is covering?
RRB ALP 17/08/2018 (Afternoon)
(a) 32 (b) 28 (c) 24 (d) 30

Q.297. A train crossed a 140 m long platform in 15 seconds and a 180 m long platform in 17 seconds. The speed of the train was:
RRB ALP 20/08/2018 (Afternoon)
(a) 75 km/h (b) 69 km/h
(c) 66 km/h (d) 72 km/h

Q.298. A man misses a train by 1 hour if he travels at a speed of 4kmph. If he had increased his speed to 5kmph, he would have still missed the train by 24 minutes. At what speed should he have travelled so that he reached the station exactly on time?
RRB ALP 21/08/2018 (Morning)
(a) 12 km/h (b) 10 km/h
(c) 8 km/h (d) 6 km/h

Q.299. Two trains, one 150 m long and

the other 130 m long, coming from opposite directions crossed each other in 7.2 seconds. The sum of speed of the two trains every hour would be:
RRB ALP 21/08/2018 (Morning)
(a) 280 km (b) 140 km
(c) 105 km (d) 70 km

Q.300. A person driving at the speed of 45 km/h reaches office 1 minute early while she reaches 3 minutes late if driving at 40 km/hr. What is the distance (in km) that she is covering?
RRB ALP 21/08/2018 (Afternoon)
(a) 24 (b) 30 (c) 32 (d) 28

Q.301. Jai travels from his house to school at a speed of 10 km/hr and reaches late by 5 minutes. If he increases his speed by 3 km/hr, he will reach the school 4 minutes early. What is the distance between his house and the school?
RRB ALP 29/08/2018 (Evening)
(a) 2 km (b) 6.5 km (c) 2.5 km (d) 4.8 km

Q.302. The distance between two places can be covered in $3\frac{1}{2}$ hours at a speed of 62 km/hr. If the speed is increased by 8 km/hr, how much time would be saved?
RRB ALP 31/08/2018 (Morning)
(a) 30 minutes (b) 15 minutes
(c) 24 minutes (d) 20 minutes

Q.303. Sunil started his journey at 2:33:34 p.m. and reached the destination at 4:43:45 p.m. Anil started the journey 45 mins 27 secs after Sunil and reached the destination 37 mins 16 secs after him. How long did Anil take to complete his journey ?
RRB ALP 31/08/2018 (Morning)
(a) 1 hour 59 min
(b) 2 hours 1 min 12sec
(c) 2 hours 2 sec
(d) 2 hours 2 min

Q.304. A 145 m long train crosses a 655 m long bridge in 36 seconds. What is the speed of the train?
RRB ALP 31/08/2018 (Morning)
(a) 60 km/h (b) 70 km/h
(c) 80 km/h (d) 75 km/h

Q.305. Raj takes $2\frac{1}{3}$ hours to complete a certain distance at a speed of 51 km/hr. What time would Kiran take to complete the same distance at a speed of 68 km/hr?
RRB ALP 31/08/2018 (Evening)
(a) 2 hours (b) $1\frac{3}{4}$ hours
(c) $1\frac{1}{2}$ hours (d) $1\frac{2}{3}$ hours

Answer key:-

1.(a)	2.(d)	3.(d)	4.(c)
5.(b)	6.(c)	7.(b)	8.(d)
9.(a)	10.(b)	11.(b)	12.(b)
13.(a)	14.(c)	15.(a)	16.(d)
17.(b)	18.(a)	19.(b)	20.(c)
21.(c)	22.(a)	23.(c)	24.(a)
25.(a)	26.(d)	27.(a)	28.(a)
29.(c)	30.(a)	31.(b)	32.(b)
33.(d)	34.(c)	35.(b)	36.(c)
37.(c)	38.(c)	39.(d)	40.(d)
41.(d)	42.(a)	43.(a)	44.(a)
45.(a)	46.(d)	47.(b)	48.(a)
49.(b)	50.(d)	51.(b)	52.(c)
53.(b)	54.(c)	55.(c)	56.(a)
57.(a)	58.(d)	59.(b)	60.(c)
61.(a)	62.(d)	63.(b)	64.(a)
65.(a)	66.(c)	67.(a)	68.(d)
69.(d)	70.(a)	71.(d)	72.(a)
73.(b)	74.(a)	75.(d)	76.(c)
77.(b)	78.(c)	79.(a)	80.(d)
81.(d)	82.(a)	83.(d)	84.(c)
85.(b)	86.(d)	87.(a)	88.(a)
89.(b)	90.(a)	91.(a)	92.(b)
93.(b)	94.(b)	95.(a)	96.(b)
97.(a)	98.(a)	99.(c)	100.(a)
101.(d)	102.(b)	103.(a)	104.(d)
105.(a)	106.(a)	107.(a)	108.(c)
109.(d)	110.(d)	111.(a)	112.(d)
113.(d)	114.(c)	115.(a)	116.(b)
117.(b)	118.(b)	119.(a)	120.(a)
121.(d)	122.(c)	123.(c)	124.(a)
125.(b)	126.(b)	127.(d)	128.(a)
129.(b)	130.(d)	131.(a)	132.(c)
133.(b)	134.(b)	135.(b)	136.(c)
137.(a)	138.(a)	139.(a)	140.(c)
141.(a)	142.(d)	143.(d)	144.(a)
145.(b)	146.(c)	147.(a)	148.(d)
149.(d)	150.(d)	151.(d)	152.(d)
153.(a)	154.(c)	155.(b)	156.(a)
157.(c)	158.(b)	159.(a)	160.(d)
161.(b)	162.(b)	163.(b)	164.(b)
165.(a)	166.(a)	167.(a)	168.(a)
169.(a)	170.(d)	171.(c)	172.(c)
173.(c)	174.(d)	175.(c)	176.(a)
177.(c)	178.(b)	179.(d)	180.(d)
181.(d)	182.(c)	183.(b)	184.(a)
185.(c)	186.(b)	187.(b)	188.(b)
189.(d)	190.(d)	191.(b)	192.(d)
193.(d)	194.(a)	195.(c)	196.(d)
197.(d)	198.(c)	199.(c)	200.(a)
201.(b)	202.(c)	203.(b)	204.(b)
205.(d)	206.(d)	207.(c)	208.(c)
209.(a)	210.(c)	211.(c)	212.(b)
213.(d)	214.(a)	215.(a)	216.(d)
217.(a)	218.(d)	219.(a)	220.(b)
221.(c)	222.(b)	223.(b)	224.(b)
225.(b)	226.(b)	227.(b)	228.(c)
229.(b)	230.(d)	231.(c)	232.(a)
233.(a)	234.(b)	235.(c)	236.(a)
237.(c)	238.(b)	239.(d)	240.(a)
241.(a)	242.(a)	243.(d)	244.(d)
245.(d)	246.(d)	247.(a)	248.(b)
249.(c)	250.(c)	251.(a)	252.(b)
253.(c)	254.(c)	255.(a)	256.(c)
257.(b)	258.(d)	259.(b)	260.(a)
261.(b)	262.(b)	263.(a)	264.(b)
265.(b)	266.(a)	267.(a)	268.(a)
269.(b)	270.(c)	271.(b)	272.(a)
273.(c)	274.(a)	275.(c)	276.(a)
277.(b)	278.(c)	279.(a)	280.(c)
281.(a)	282.(b)	283.(d)	284.(c)
285.(a)	286.(b)	287.(b)	288.(b)
289.(d)	290.(a)	291.(a)	292.(b)
293.(a)	294.(b)	295.(b)	296.(c)
297.(d)	298.(d)	299.(b)	300.(a)
301.(b)	302.(c)	303.(d)	304.(c)
305.(b)			

Solutions:-

Sol.1.(a) Let the distance travelled latter = x km., Average speed
$= \frac{total\ dist.}{total\ time} = \frac{80+x}{3+2} = 30$
$\Rightarrow 80 + x = 150 \Rightarrow x = 70\ km$

Sol.2.(d) On average speed
time = $\frac{800}{60} = 13\frac{1}{3}$ hours
Initially consumed time = $\frac{300}{50}$ = 6 hours
Therefore

Speed = $\frac{800-300}{13\frac{1}{3}-6} = \frac{500\times 3}{22}$

= $\frac{750}{11}$ km/h

Sol.3.(d) Distance covered by him

= $\frac{1}{4}\times 8 = 2$ km

and remaining distance = 8 - 2 = 6 km

Time taken by him = $\frac{1}{3}\times 60 = 20$min,

$remaining\ time = 60 - 20 = 40\ min$

Required speed = $\frac{6\times 60}{40} = 9\ km/h$

Sol.4.(c)

Let the length of the train be x m and speed of the train be s km/h

$(s-2)\times 9 = (s-4)\times 10$

$\Rightarrow 9s - 18 = 10s - 40$

$\Rightarrow 10s - 9s = -18 + 40$

$\Rightarrow s = 22\ km/h$

Now, length of the train

= (22 - 2) × $\frac{5}{18}\times 9 = 50\ m$

Sol.5.(b)

Effective speed = 14 -13 = 1 km/h

⇒ $\frac{5}{18}$ m/s

Difference of Distance covered by policeman after 6 minutes

= $\frac{5}{18}$ × 360 =100m

Required distance = 150 -100= 50m

Sol.6.(c) A : B

Speed → 2 : 3

After meeting, $\frac{S_1}{S_2} = \sqrt{\frac{t_2}{t_1}}$

$\Rightarrow \sqrt{\frac{p}{5.4}} = \frac{2}{3} \Rightarrow p = \frac{4}{9}\times 5.4$

$\Rightarrow p = 2.4\ hr.$

Sol.7.(b) Let the speed

= a, a + 4, a + 8, a + 12, a + 16

According to the question,

a + a = 80 = a = 40

So, distance for first two hours

= 40 + 40 = 80 km

Distance for next two hours

= 44 + 44 = 88 km

Distance for next two hours

= 48 + 48 = 96 km

Distance for next two hours

= 52 + 52 = 104 km

Distance for next two hours

= 56 + 56 = 112 km

Total distance = 80 + 88 + 96 + 104 + 112 = 480 km

Sol.8.(d) Distance covered by train A in first 1 hr = 75 km

Now, remaining distance between both trains = 690 - 75 = 615 km

Relative speed = 75 + 60 = 135 km/h

Time when both trains meet

= $\frac{615}{135} = 4\ hr\ 33\ min\ 20\ sec.$

Hence, they will meet at = 9 + 4 : 33: 20 = 01 : 33 : 20 am

Sol.9.(a)

Let the distance travelled by him be x.

Time taken by him be T1 and T2 and speed be V1 and V2.

T1 = $\frac{x}{V1}$, $T2 = \frac{x}{V2}$

$\Rightarrow \frac{2x}{T1+T2} = 5 \Rightarrow \frac{2x}{\frac{x}{V1}+\frac{x}{V2}} = 5$

$\Rightarrow \frac{2(V1V2)}{V1+V2} = 5$..... (1)

$\frac{V1\times t + V2\times t}{2t} = 5.5 \Rightarrow \frac{V1+V2}{2} = 5.5$

$\Rightarrow V1 + V2 = 11$..... (2)

From eq . (1) and (2), V1V2 = $\frac{55}{2}$

V1 - V2 = $\sqrt{11^2 - 4\times\frac{55}{2}}$

= $\sqrt{121-110} = \sqrt{11}$

Hence, the positive difference between the two speeds = $\sqrt{11}$

Sol.10.(b) Given, diameter of wheel = 63cm , radius = 31.5 cm

Circumference = 2 π r

= $2\times\frac{22}{7}\times 31.5 = 198\ cm$

Distance travelled by the wheel in 100 revolutions = 198 cm × 100 =198 m

Sol.11.(b) Time taken by train A to reach station N = 8 hours

Time taken by train B to reach station M = 7 hours

Let the total distance = 56 unit

If distance is same , time α $\frac{1}{speed}$

	A	B
Ratio of time =	8	7
Ratio of speed =	7	8

In 2 hours, A covered 14 units , remaining distance = 42 units

Relative speed for remaining distance = 15 unit per hour

Time taken to cover remaining distance

= $\frac{42}{15}$ = 2 hours 48 min.

Time when A and B meet = 8.00 a.m. + 2 hours 48 min. = 10.48 a.m.

Sol.12.(b)

Actual time to reach office = 9 : 46 - 7 : 40 = 2 hours 6 min or 2.1 hour

speed = 28x km/h

Distance = 2.1 × 28x = 58.8x km

Time taken to cover one-fourth of the distance at $\frac{6}{7}$ of the usual speed

= (58.8x/4) ÷ ($\frac{6}{7}\times$ 28x)

⇒ 0.6125 hour = 36 minutes 45 seconds

Rest of the distance

= 58.8x - 14.7x = 44.1x

Time taken to cover the rest of the distance at $\frac{6}{5}$ of the usual speed

= 44.1x ÷ ($\frac{6}{5}\times$ 28x)

⇒ 44.1x/33.6x = 1.3125 hours = 1 hour 18 minutes 45 seconds

Total time taken to cover the entire distance = 1 hour 55 minutes 30 seconds

Ramen reached office at = 7.40 am + 1 hr 55 min 30 sec = 9.35.30 am

Sol.13.(a)

Time taken by P = $\frac{400}{4}$ = 100 s

Time taken by Q = $\frac{400}{8}$ = 50 s

Time taken by R = $\frac{400}{16}$ = 25 s

Time taken by S = $\frac{400}{20}$ = 20 s

LCM of (100, 50, 25, and 20) = 100 s

Sol.14.(c) Let the speed be S km/h

$\frac{S(S+12)}{12}\times 8 = \frac{S(S-12)}{12}\times 12$

$2S + 24 = 3S - 36$

$S = 60\ km/h$

Now, Distance = $\frac{60(60+12)}{12}\times 8$

= 2880 km

Sol.15.(a) Average speed

= $\frac{12+12+12+12}{\frac{12}{20}+\frac{12}{40}+\frac{12}{60}+\frac{12}{120}}$

= $\frac{48}{0.6+0.3+0.2+0.1} = \frac{48}{1.2} = 40$

Sol.16.(d) Stoppage time = $\frac{Excluding\ stoppage\ speed - Including\ stoppage\ speed}{excluding\ stoppage\ speed}$ × 60

Stoppage time = $\frac{45-27}{45}\times 60$

= $\frac{18}{45}\times 60 = 24\ minutes$

Sol.17.(b) Let the distance between the school and his house be D km

$\frac{D}{2.5} - \frac{D}{3.5} = \frac{12}{60} \Rightarrow D = 1.75\ km$

Sol.18.(a)

Here the total horizontal distance travelled by bus 1 is = (35 + 42) = 77 km
On the other hand, horizontal distance travelled by bus 2 is = 36 km
So, the distance between the two buses in this situation = {185 - (77 + 36)}
= 72 km

Sol.19.(b) 50% = $\frac{1}{2}$ If Speed of Bus is 2 then Speed of the train will be 3.
Distance is equal for both train and Bus.

$D_T = D_B$

$\Rightarrow S_T \times T_T = S_B \times T_B$

$\Rightarrow \frac{S_T}{S_B} = \frac{T_B}{T_T} = \frac{3}{2}$

Difference of Time = 1 which is equal to 12.5 minutes.
Time of Bus = 3 which is equal to
3 × 12.5 = 37.5 minutes = $\frac{5}{8}$ hour

Speed of Bus = $\frac{75}{\frac{5}{8}} = \frac{75 \times 8}{5}$

= 120 Km/h

Sol.20.(c) They will meet at the starting point again after a time interval which is LCM of time taken by them.
LCM of (18 and 12) = 36 minutes

Sol.21.(c)
At starting total passengers = 450
At the 1st stop = ($\frac{8}{9}$ × 450) + 20 = 420
At the 2nd stop = ($\frac{5}{6}$ × 420) + 19
= 350 + 19 = 369
∴ Passengers at 3rd stop = 369

Sol.22.(a)
The distance of school = $\frac{3}{2}$ × 3 = 4.5 km
Returning distance = 3.5 km
Time after rest = 1 hour
Speed in returning = 3.5 km/h
Increase in speed = 3.5 - 3 = 0.5 km/h
% increase = $\frac{0.5}{3}$× 100 = 16$\frac{2}{3}$%

Note : The given options in the question paper were wrong the correct answer is 16.66%

Sol.23.(c) Car A is twice as fast as car B
⇒ efficiency of A : B = 2 : 1
And Car B is thrice as fast as Car C
⇒ efficiency of B : C = 3 : 1
So, efficiency ratio of A : B : C = 6 : 3 : 1
Now, the distance covered by Car C in 60 minutes will be covered by car B in
= $\frac{60}{3} = 20$ minutes.

Sol.24.(a) We know that ,
D = S × T
Let , speed of the carriage = x
100 m = (x - 3) × (4 × 60)
(x - 3) = $\frac{100}{240} \times \frac{18}{5}$

⇒ X = $\frac{54}{12}$ = 4.5 km/h

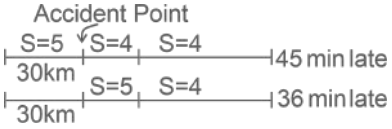
Sol.25.(a)
Total Time taken by air & Train = 4 Hours.
Time taken by air (All the way) = (Total Time - Saving Time) = 4 - 2 = 2 Hours.
So, we can say That ,
Speed By air = (Distance/Time)
= (360/2) = 180km/h. -------- (1).
Now,
We have given that, If he had travelled all the way by air, he would have saved (4/5)th of the time he was on the train.
So, we can say That,
(4/5) × Time taken by train = 2 Hours.
Time taken by train
= (2×5/4) = (5/2) = 2.5 hours.
Time Taken by air
= (3/2) Hours = 1.5 hours --------- (2)
From Equation (1) & (2) , we get,
Total Distance Covered By air
= Speed × Time.

Total Distance Covered By air = 180 × $\frac{3}{2}$

Total Distance Covered By air = 270km.

Sol.26.(d) Distance covered by train
= 4 × 45 = 180 km = 180000 m
Distance between two poles = 50 m
Number of poles = $\frac{180000}{50}$
= 3600 + 1(in starting) = 3601

Sol.27.(a)



Total time saved = 45 - 36 = 9 minutes
For 18 km distance
Distance in both cases are equal = 18 km
$\Rightarrow \frac{S_1}{S_2} = \frac{T_2}{T_1} = \frac{4}{5}$
Difference of time = 1 unit = 9 minutes
$T_2 = 4\ unit = 36\ minutes = \frac{36}{60} = \frac{3}{5}h$
Speed = $\frac{D}{T} = \frac{18}{3} \times 5 = 30\ km/h$

Sol.28.(a) A start journey 5 hour before then A cover distance =300
Taken time by B to overtake A
= $\frac{300}{75-60}$ = 20 h
Total time taken by A when B overtake
= 20 + 5 = 25 h
Distance covered by A
= 25 × 60 = 1500 km
C takes time to overtake A
= $\frac{1500}{80}$ = 18 : 45 h
C starts journey time after A did
= 25 - 18 : 45 = 6 hr. 15 mint

Sol.29.(c) Total distance = 470 km
Initial speed = 40 km/h
In 1st hour = 40 km distance is covered
In 2nd hour = 60 km
In 3rd hour = 80 km
In 4th hour = 100 km
In 5th hour = 120 km
In 5 hour = 400 km is covered
Next 70 km is covered at a speed of 140 km/h in 30 minutes
Total time = 5 hour 30 minutes

Sol.30.(a) Speed of the engine when no wagon is attached is 50 km/h
The rate of diminishes (50 - S) α √N
N is the number of wagon attached to the engine or 50 - S = K √N
When N = 25 , S = 35 km/h or 50 - 35 = K
$\sqrt{25}$ or K = $\frac{15}{5}$ = 3
If the speed S = 11 km/h
Then , (50 - 11) = 3 × $\sqrt{N}$
A/Q
⇒ (50 - 11) = 3 × $\sqrt{N}$ ⇒ 39 = 3 × $\sqrt{N}$
⇒ 13 = $\sqrt{N}$ ⇒ N = 13^2 = 169

Sol.31.(b) Let the ratio of the speeds of train P and Q = 2 : 1
Relative speed = 2 - 1 = 1
A/Q, $\frac{length\ of\ (P+Q)}{1} = 60$ seconds
$\Rightarrow P + Q = 60$ .... E.q .(1)
$\frac{length\ of\ Q}{1} = 40 \Rightarrow Q = 40$ .... e.q .(2)
P = 20 m , Q = 40 m
So, ratio of the length of the train P and Q = 20 : 40 or 1 : 2

Sol.32.(b) Distance of the course = 200 m
Now, we can say that,
Q covers 35 m in 7 sec.
Time taken by Q to covers 200 m
→ $\frac{7}{35}$× 200 = 40 sec.
Hence, P covers 200 m → 40 –7 = 33 sec.

Sol.33.(d) Time prior to crossing each other = $\sqrt{T_1 \times T_2} = \sqrt{54 \times 24}$
= 36 minutes
Time taken by person to moved from Q to P to complete his journey
= 36 + 24 = 60 minutes

Sol.34.(c) Distance covered by one train from station P to Q
= (80 × 12) km/h = 960 km
Distance covered by other train from station Q to P

= (95 × 12) km/h = 1140 km
Difference between the distances covered by them → 1140 - 960 = 180 km

Sol.35.(b)
Circumference of the planet= 36,000 km
Time taken to complete one rotation = 20 hr
Speed of the planet = $\frac{36000}{20}$ = 1800 km/hr
Now, speed in m/s = $\frac{5}{18} \times 1800$
= 500 m/sec

Sol.36.(c) Let speed of gaurav while returning is x km/hour
So average speed
$\frac{2 \times 20 \times x}{20 + x} = 15$
40x = 300 + 15x ⇒ 25x = 300
⇒ x = 12 km/h

Sol.37.(c) Let the distance between her house and the venue of the birthday party be x km .
$\Rightarrow \frac{x}{3} - \frac{x}{4} = \frac{50}{60}$
$\Rightarrow \frac{4x - 3x}{12} = \frac{50}{60} \Rightarrow \frac{x}{12} = \frac{50}{60}$
$\Rightarrow x$ =10
Hence, the distance between her house and venue of birthday party = 10 km

Sol.38.(c) Average speed =
$\frac{total\ distance}{total\ time} = \frac{(20 \times 100) + (70 \times 50)}{100 + 50}$
$= \frac{2000 + 3500}{150} = \frac{5500}{150} = \frac{110}{3} m/min$

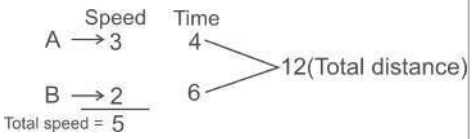
Sol.39.(d) Total distance (360) = $60\ kmph \times 2h + 75 kmph \times 2h + 90 kmph \times 1h$
= 120 + 150 + 90 = 360
Total time taken = 2 + 2 + 1 = 5 hours.

Sol.40.(d) Average speed = $\frac{2 \times S1 \times S2}{S1 + S2}$
$= \frac{2 \times 60 \times 100}{100 + 60} = 75\ km/h$

Sol.41.(d)
Perimeter of the square = 4 × 38 = 152 m
Time taken by boy
= $\frac{152 \times 18}{6 \times 5} = 91.2\ sec$

Sol.42.(a)
Speed of the car = $\frac{275}{5} = 55\ km/h$
Time taken by car to cover 250 km with reduced speed= $\frac{250}{50} = 5$ hr

Sol.43.(a)



Time taken by A and B
= $\frac{12}{5}$ = $2\ hr.\ 24\ min$
They will meet at
= 9:00 + 2hr 24 min = 11:24 am

Sol.44.(a)
Average speed = $\frac{Total\ distance\ covered}{Total\ time\ taken}$
$= \frac{800}{4} \times \frac{5}{18} = \frac{500}{9}\ m/sec$

Sol.45.(a) A's speed = 60 km/h
and B's speed = 40 km/h
When time is constant, speed$\propto distance$
Distance covered by A : Distance covered by B = 60: 40 or 3 : 2
1 unit → $60\ km$
(2 + 3) units → 60 × 5 = 300
Total distance = 300 km

Sol.46.(d)
Relative speed = 56 - 46 = 10 m/s
Length of the both trains = 10 × 26 = 260
Length of each train = 260 ÷ 2 = 130 m

Sol.47.(b)
Distance covered = 10 × 2 = 20 km
Time taken with new speed
= $\frac{20}{15} = 1\ hr\ 20\ minutes$
So, time saved = 2 hr - 1 hr 20 min
= 40 minutes

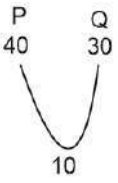
Sol.48.(a) Average speed = $\frac{80 + 30}{\frac{80}{20} + \frac{30}{30}}$
= $\frac{110}{5}$ = 22 km/h

Sol.49.(b)
Let the length of the train be x m
$\frac{(x+90) \times 18}{54 \times 5} = 60$
$\Rightarrow x + 90 = 900 \Rightarrow 810m$
Now, time taken by train to cross the pole
= $\frac{810 \times 18}{54 \times 5} = 54\ seconds.$

Sol.50.(d) In 1 liter of petrol car can cover a distance of 25 km
In $5\frac{1}{2}$ $liters$ of petrol it can cover
= $25 \times 5\frac{1}{2} = 137.5\ km$

Sol.51.(b) Speed of the train
= $\frac{725 + 235}{48} \times \frac{18}{5}$
= $\frac{960}{48} \times \frac{18}{5} = 72\ km/h$

Sol.52.(c)



$10 km\ more\ in \rightarrow 1hr$
$80\ km\ more\ in \rightarrow 8\ hr$
Relative speed = (40 + 30) = 70 km/h
Distance between P and Q = 70 × 8
= 560 km

Sol.53.(b) Average speed
= $\frac{2S_1 S_2}{S_1 + S_2} = \frac{2 \times 30 \times 60}{30 + 60}$
= $\frac{2 \times 30 \times 60}{90} = 40\ km/h$

Sol.54.(c) Let the length of train P = L
ATQ,
$\frac{170 + L}{(70-56) \times \frac{5}{18}}$ = 90
$\Rightarrow 170 + L$ = 90 × 14 × $\frac{5}{18}$
⇒ L = 350 - 170 ⇒ 180 m
Now,
Time taken by train P to completely cross train Q moving in opposite direction
= $\frac{220 + 180}{(74 + 70) \times \frac{5}{18}} \Rightarrow \frac{400}{40}$
= 10 sec

Sol.55.(c)
Let speed of the first train be x km/h
16 = $\frac{280}{(x-8)} \times \frac{18}{5} \Rightarrow 2x - 16 = 126$
$\Rightarrow 2x = 126 + 16 \Rightarrow x = 71$
Now, time taken by the train to cross the second train = $\frac{280+380}{71+37} \times \frac{18}{5}$
$= 22\ seconds.$

Sol.56.(a) Total distance covered
= $2\frac{1}{4} \times 36 + 1\frac{3}{4} \times 56 = 179\ miles$

Sol.57.(a)
Total distance = 150 km, total time taken = 12 hours.
$Distance\ covered = \frac{2}{3} \times 150 = 100\ km$
$time\ taken = \frac{5}{8} \times 12 = 7.5\ hr$
Remaining distance = 150 - 100 = 50 km
and remaining time = 12 - 7.5 = 4.5 hr
Required speed to cover the remaining distance = $\frac{50}{4.5} = 11.1\ km/h$

Sol.58.(d) ATQ,
Let the length of train = l
$\frac{l}{10} = \frac{l + 300}{20} \Rightarrow 20\ l = 10\ l + 3000$
$\Rightarrow 10\ l = 3000$ So, l = 300 m

Speed of train = $\frac{300}{10}$ = 30 m/s

Speed in km/h = 30 × $\frac{18}{5}$ = 108 km/h

Sol.59.(b)
Actual time taken by bus = 3 hours 15 minutes - (10 + 5)minute = 3 hours
Then the average speed
= $\frac{160}{3} \Rightarrow 51\frac{1}{3}$ km/h

Sol.60.(c) Let the length of train = l
And speed of train = x m/s
$\frac{l}{x-15} = 20 \Rightarrow l$ = 20 x - 300 .... (1)
And $\frac{l}{x-35}$ = 40 ⇒ l = 40x -1400 .... (2)
By equating equation (1) with (2)
⇒ 20x - 300 = 40x -1400
⇒ 40x - 20x = 1100
20x = 1100 ⇒ x = 55 m/s
By putting value of x in equation (1)
l = 20 × 55 - 300
l = 1100 - 300 = 800

Sol.61.(a) Let the total distance = x km
According to the question ,
$\frac{\frac{x}{3}}{40} + \frac{\frac{2x}{3}}{60} = 14 \Rightarrow \frac{x}{120} + \frac{x}{90} = 14$
$\Rightarrow \frac{3x+4x}{360} = 14 \Rightarrow \frac{7x}{360} = 14$
So, x = 720 km

Sol.62.(d) Let the length of the train A be x m then length of train B is $2.5x$ m
Relative speed = 63 + 45 = 108 km/h or
$\frac{5}{18} \times 108 = 30\ m/sec$
$\Rightarrow \frac{x+2.5x}{30} = 21$
$\Rightarrow 3.5x = 630 \Rightarrow x = 180$
Length of train A = 180 m and length of train B = 450 m
Let the length of the bridge be l m
$\frac{450+l}{45} \times \frac{18}{5} = 76 \Rightarrow \frac{2(450+l)}{25} = 76$
$\Rightarrow 900 + 2l = 1900$
$\Rightarrow 2l = 1900 - 900 \Rightarrow 2l = 1000 \Rightarrow l = 50$
Hence, the length of the bridge = 500 m

Sol.63.(b) ATQ,

	M	:	N
Length →	x	:	2x

Speed of M = $\frac{x}{30}$ unit
Speed of N = $\frac{2x}{105}$ unit
Therefore required ratio
$\Rightarrow \frac{x}{30} : \frac{2x}{105}$ = 7 : 4

Sol.64.(a)
Let the usual speed be x km/hr
$\frac{1800}{x-10} - \frac{1800}{x} = 2$
$\Rightarrow \frac{1800(x-x+10)}{x(x-10)} = 2$
$\Rightarrow x^2 - 10x - 9000 = 0 \Rightarrow x = 100$
Now time taken by vehicle at its usual speed = $\frac{1800}{100} = 18\ hours$

Sol.65.(a) Average speed = $\frac{2 \times S1 \times S2}{S1+S2}$
$= \frac{2 \times 20 \times 30}{20+30} = \frac{2 \times 20 \times 30}{50}$
$= 24\ km/h$

Sol.66.(c) Total distance covered by the train = $30 \times 2\frac{1}{2} + 60 \times 1\frac{1}{2} = 30 \times \frac{5}{2}$
$+ 60 \times \frac{3}{2} = 75 + 90 = 165\ miles$

Sol.67.(a)
Let the length of the other train be x
Relative speed = 80 + 120 = 200 km/h
200 x $\frac{5}{18} = \frac{300+x}{12} \Rightarrow \frac{2000}{3}$ = 300 + x
⇒ 666.67 - 300 = x ⇒ x = 366.67m

Sol.68.(d)
Average speed of the boy = $\frac{2\ S1 \times S2}{S1+S2}$
$= \frac{2 \times 3 \times 5}{3+5} = \frac{2 \times 3 \times 5}{8} = 3.75\ km/h$
The distance between his home and school = $\frac{3.75 \times 4}{2} = 7.5\ km$

Sol.69.(d) Speed = 84 km/h
New speed = 84 × $\frac{100-12}{100}$
= 73.92 km/h.

Sol.70.(a) Distance travelled by train B in 40 minutes = $\frac{40}{60} \times 80 = \frac{160}{3}$ km
Now, remaining distance
= 450 - $\frac{160}{3} = \frac{1190}{3}\ km$
Relative speed = 60 + 80 = 140 km/h
Time taken by both trains to cross each other = $\frac{1190}{3 \times 140} = \frac{17}{6}\ hr.$
The two trains meet
= $\frac{17}{6} \times 60 = 170\ km$
Hence, at 170 km far from Delhi both trains will meet.

Sol.71.(d) Relative speed
= 85 + 105 = 190
Speed ratio = 85 : 105 = 17 : 21
Distance ratio = 17 : 21
4 unit = 200 km
38 unit = 1900 km
Hence, total distance = 1900 km

Sol.72.(a) Relative speed = 59 - 50 = 9 km/h
Time taken by both train to cross each other = $\frac{240+320}{9} \times \frac{18}{5}$
$= 224\ seconds\ or\ 3\ min\ 44\ sec.$

Sol.73.(b) Let the total distance = X
ATQ,
$\frac{\frac{x}{4}}{25} + \frac{\frac{3x}{4}}{30} = 14 \Rightarrow \frac{x}{100} + \frac{x}{40} = 14$
$\Rightarrow \frac{2x+5x}{200} = 14 \Rightarrow \frac{7x}{200} = 14$
Therefore, total distance (x) = 400km

Sol.74.(a)
Relative speed = 64 + 80 = 144 km/h
Time taken by train to cross a man in the train = $\frac{720}{144} \times \frac{18}{5} = 18\ seconds.$

Sol.75.(d) Time = $\frac{distance}{speed} = \frac{364}{52}$
= 7 hours

Sol.76.(c) if two train running opposite direction we, simply add their speed for relative speed so Relative speed = 50+58 =108 km/h so in speed(m/s)
= 108 × $\frac{5}{18}$ = 30 m/s

Sol.77.(b) Let the length of both the trains be x metres.
Relative speed = 36 - 26 = 10 km/h
$\frac{x+x}{10} \times \frac{18}{5} = 18$
$\Rightarrow 2x = 50 \Rightarrow x = 25$
Hence, the length of each train is 25 metres.

Sol.78.(c) Average speed
= $\frac{220+250+140}{\frac{220}{11}+\frac{250}{5}+\frac{140}{7}} = \frac{610}{20+50+20}$
= $\frac{610}{90}$ = $6\frac{7}{9}$ km/h

Sol.79.(a)
Total distance = 4 × 60 = 240 km
Distance travelled for the first 2 hours
= 65 × 2 = 130 km
Remaining distance = 240 - 130 = 110 km
Speed of the car in next 2 hours
= $\frac{110}{2}$ = 55 km/h

Sol.80.(d)
Ratio of original to new speed = 5 : 2
Ratio of original to new time = 2 : 5
Difference = 5 - 2 = 3 unit
According to question,
3 unit = 30 min
2 unit = 20 min
So, Original time of Ravi = 20 min

Sol.81.(d) Let the total distance = 2d km

$\frac{d}{40}+\frac{d}{5}=\frac{9}{2} \Rightarrow \frac{d+8d}{40}=\frac{9}{2}$

$\frac{9d}{40}=\frac{9}{2} \Rightarrow$ d = 20 km

So, total distance = 2 × 20 = 40 km

Sol.82.(a) Relative speed = 46 - 36

= 10 km/h or 10 × $\frac{5}{18}=\frac{25}{9}$ m/s

Sol.83.(d)

54 km/h = 54 × $\frac{5}{18}$ m/s = 15 m/s.

Required time = $\frac{Distance}{Speed}=\frac{450}{15}$

= 30 seconds.

Sol.84.(c)

In this question, distance is constant.

Let , new time = T , so original time

= (T + $\frac{15}{60}$)

Also, let original speed = 10y, so new speed = 13y

According to the question,

10y × (T + $\frac{15}{60}$) = 13y × (T)

10× (T + $\frac{1}{4}$) = 13 × (T)

10T + $\frac{5}{2}$ = 13T $\Rightarrow$ 3T = $\frac{5}{2}$ $\Rightarrow$ T = $\frac{5}{6}$

So, required original time = T + $\frac{15}{60}=\frac{5}{6}$

+ $\frac{15}{60}=\frac{65}{60}$ hr ≈ 1 hours 05 minutes

Short tricks:-

Here , distance is constant so , speed is inversely proportional to time .

Now, speed increase by 30%

		Original	:	New
Speed	→	10	:	13
Time	→	13	:	10

Increased time ⇒ 3 units = 15 min.

Original time ⇒ 13 units = 13 × 5 min.

= 65 min. = 1 hour 05 minutes

Sol.85.(b)

Let one - way distance = 222 km ,

Total distance = 444 km

Total time

= $\frac{222}{74}+\frac{222}{111}$ = 3 + 2 = 5 hours.

Average speed = $\frac{444}{5}$ = 88.8 km/h.

Trick:-

Average speed during two-way journey = $\frac{2xy}{x+y}$, where x and y are the speeds during the two-way journey.

$\frac{2xy}{x+y}=\frac{2\times74\times111}{74+111}$ = 88.8 km/h

Sol.86.(d)

Average speed = $\frac{total\ distance}{total\ time}$

$\Rightarrow 42=\frac{250+120+50}{\frac{250}{50}+\frac{120}{k}+\frac{50}{25}}$

$\Rightarrow 42=\frac{420}{5+2+\frac{120}{k}}$

$\Rightarrow 7+\frac{120}{k}=\frac{420}{42} \Rightarrow 3=\frac{120}{k}$

⇒ k = 40 km/h

Sol.87.(a) Distance = 57.6 km

Time = 48 min

Speed = $\frac{57.6}{48}\times 60$ = 72 km/h or 20 m/s

Sol.88.(a) Speed = 90 km/h or 25 m/s

Length of the train = 25 × 18 = 450 m

Let the length of the platform = x

As per question,

(450 + x) = 65 × 25

450 + x = 1625 ⇒ x = 1175

So, length of platform = 1175 mt.

Sol.89.(b) Relative speed = 145 + 17

= 162 km/h or 45 m/s

Time = $\frac{225}{45}$ = 5 sec

Sol.90.(a) Relative speed = 61 + 47

= 108 km/h or 30 m/s

Time = $\frac{265+245}{30}$ = 17 sec

Sol.91.(a)

Let the speed of goods train = x km

As per question,

(x - 5) × 21 = (x - 10) × 24

21x - 105 = 24x - 240

3x = 135 ⇒ x = 45 km/h

Length of goods train

= (45 - 5) × $\frac{5}{18}$ × 21 = 233.33 = $233\frac{1}{3}$m

Sol.92.(b) Speed of Julie = $\frac{140}{18}$ m/s or

$\frac{140}{18}\times\frac{18}{5}$ = 28 km/h

Distance covered in 1 hour = 28 km

Sol.93.(b) Let the distance = x

As per question,

$\frac{x}{50}+\frac{x}{10}=\frac{144}{60}$

$\frac{x+5x}{50}=\frac{144}{60}$

360x = 144 × 50 ⇒ x = 20

Total distance = 20 + 20 = 40 km

Short trick:-

Average speed = $\frac{2\times50\times10}{50+10}=\frac{50}{3}$

Distance = $\frac{50}{3}\times\frac{144}{60}$ = 40 km

Sol.94.(b) Distance = 240 km

Speed ratio of A and B = 5 : 7

As per question,

7 unit = 84 km/h ⇒ 5 unit = 60 km/h

Speed of A = 60 km/h

Relative speed = 84 + 60 = 144 km/h

Required time = $\frac{240}{144}$

= $\frac{5}{3}$ hours or 100 min

Sol.95.(a) Relative speed = 62 + 10

= 72 km/h or 20 m/s

Length of the train = 20 × 12 = 240 m

Sol.96.(b) Let the length of train = x m

As per question,

$\frac{x+1000}{60}=\frac{x+750}{50}$

5x + 5000 = 6x + 4500 ⇒ x = 500

Speed = $\frac{500+750}{50}$ = 25 m/s or

25 × $\frac{18}{5}$ = 90 km/h

Sol.97.(a)

Speed of car = $\frac{396}{6}$ = 66 km/h

As per question,

11 unit = 66 km/h ⇒ 7 unit = 42 km/h

Speed of bus = 42 km/h

Sol.98.(a) Let the distance between both points = 180 km

Total time taken

= $\frac{180}{45}+\frac{180}{36}$ = 4 + 5 = 9 hours

So, the average speed

= $\frac{180+180}{9}$ = 40 km/h

Sol.99.(c)

In 50 minutes Ansh covered = 35 km

In 1 hour he will cover

= $\frac{35}{50}\times 60 = 42\ km/h$

Speed → 8 : 7

7 units → 42 ⇒ 8 units → 48

Hence, his usual speed=48 km/h

Sol.100.(a) Length of the train

= $95\times\frac{5}{18}\times 18 = 475\ m$

Sol.101.(d) Let the total journey be x km

$\frac{5x}{12}+\frac{x}{3}+36=x$

$x-\frac{x}{3}-\frac{5x}{12}=36$

$\frac{x}{4}=36 \Rightarrow x=144\ km$

Sol.102.(b)

(If distance is same time gets reversed)

		A	:	B
Speed	→	4	:	5
Time	→	5	:	4

, the difference between time is 1 unit

So, 1 unit= 20 mins
Total distance = 5 × 4 × 20 = 400unit
Time taken by A(speed is doubled)
= $\frac{400}{8} = 50\ min$

Sol.103.(a)

Average speed = $\frac{Total\ distance}{Total\ time}$

= $\frac{300+360+420}{\frac{300}{50}+\frac{360}{30}+\frac{420}{60}}$

= $\frac{1080}{25} = 43.2\ km/h$

Time taken by her to cover 216 km
= $\frac{216}{43.2} = 5\ hours$

Sol.104.(d)

Speed of the train = $\frac{360}{12} = 30\ m/s$

Time taken by train to cross 150 m long bridge = $\frac{360+150}{30} = \frac{510}{30} = 17\ sec$

Sol.105.(a) Let the distance covered by Train 1 be x km

Now , $\frac{x}{30} = \frac{x+30}{35}$

$\Rightarrow 5x = 900 \Rightarrow x = 180\ km$

Total distance = distance covered by train1 and train 2 = 180 + 180 + 30
= 390 km

Sol.106.(a) 24% of the distance covered in = 14 min 24 sec or 14.4 min

1% of the distance covered in = $\frac{14.4}{24}$

100% of the distance covered in

= $\frac{14.4}{24} \times 100 = 60\ min$

She will reach her destination
= 9 : 25 am + 60 min = 10.25 am

Sol.107.(a)

Average speed = $\frac{Total\ distance}{Total\ time}$

68.3 = $\frac{2D}{4} \Rightarrow D = 136.6\ km$

Sol.108.(c) Average speed

= $\frac{(50\times2)+(35\times2)+(100\times4)}{2+2+4}$

= $\frac{570}{8}$ = $71.25\ km/h$

Sol.109.(d) Let Arjun's speed be A km/h and Rohit's speed be R km/h

$\frac{60}{A}-\frac{60}{R} = 2$ ..... (1)

$\frac{60}{R}-\frac{60}{2A} = 1$ ..... (2)

Divide equation(1) by 2

$\frac{60}{2A}-\frac{60}{2R} = 1$ ..... (3)

Adding eq . (2) and (3) we get,

$\frac{60}{R}-\frac{60}{2R} = 2 \Rightarrow R = 15\ km/h$

And, Speed of Arjun = 10 km/h

Sol.110.(d) Let the distance from station A to the point where the two trains meet = x,
That is, the distance from station B to the point where the two trains meet
= (725 - x),
As we know that the second train started 30 minutes after the first train started,

$\Rightarrow \frac{x}{50} - \frac{725-x}{150} = \frac{30}{60}$

$\Rightarrow 3x - 725 + x = 75 \Rightarrow x = 200$

Then the distance from station A to the point where both the trains meet is 200 km.

Sol.111.(a) A train running at 60 km/h crosses a pole in 1.5 minutes.
Here speed of train = 60 km/h

= $\frac{5}{18} \times 60$ m/s = $\frac{50}{3}$ m/s.

Length of train = $\frac{50}{3} \times 1.5 \times 60$ m
= 1500 m.

Sol.112.(d) Parshotam and Anjilka started moving in the opposite directions i.e their relative speed is = speed of Parshotam + speed of Anjilka
= (30 + 3.5) km/h = 33.5 km/h
So, in 2 hours they will be away from each other by
= 33.5 × 2.5 km = 83.75 km

Sol.113.(d) As we know, if both distances are equal then the

average speed = $\frac{2\times a\times b}{a+b}$

[where a = 75 Km/h and b = 50 km/h]

So, $\frac{2\times 75\times 50}{75+50}$ = 60 km/h

Sol.114.(c) Relative speed (opposite direction) = 80 + 70 = 150km/h,
crossing time = 30 sec
In 1 hour ---- 150 km is covered,
In 3600 sec ---- 150 ×1000m is covered,
In 36 sec ---- 1500m

$\therefore$ 30 sec ---- $\frac{1500}{36} \times 30 = 1250$m

Length of train B = 1250 - 300 = 950 m.

Sol.115.(a) S_1= 30 km/h ---- 5 min late

S_2= 40 km/h ---- 3 min early

Due to increase in speed, Vinod saves 8 minutes,
Distance is equal in both cases,

$S_1 \times T_1 = S_2 \times T_2$

$\frac{S_1}{S_2} = \frac{T_2}{T_1} = \frac{30}{40} = \frac{3}{4}$

If T_1= 4 and T_2= 3
Diff (time) = 1 ---- 8 min.

$\therefore T_1$= 4×8 = 32 min.= $\frac{32}{60}$hours

Distance = S × T = 30 × $\frac{32}{60}$ = 16km

Short Tricks: - As we know , when distance is constant then the ratio of speed and ratio of time in inverse.

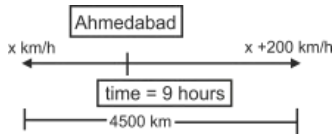
Speed → 3 : 4
Time → 4 : 3

According to question ,
1 unit = 8 min.
Then, 4 units = 32 min.
Now, distance = speed × time
= 30 × $\frac{32}{60}$ = 16 km

Sol.116.(a) In this case time is equal for both cars = 9h
Distance = 4500 km
Let speeds of both cars = x and y km/h
For opposite direction,
Relative speed = x + y km/h

Relative speed = $\frac{4500}{9}$ = 500 km/h.

Short Tricks :-



Extra Distance covered by B due to extra speed of 200 km/h in 9 hours = 1800 km
Now, the remaining distance
= 4500 km - 1800 km = 2700 km
2700 km is covered equally by A and B because of equal speed

Speed of A = $\frac{1350}{9}$ = 150 km /h Then ,

Speed of B = 150 + 200 = 350 km/h
Sum of the speeds of both cars = 350 + 150 = 500 km /h

Sol.117.(b) Let the speed of the train be S. And the length of the train be x.
When a train crosses a man, it travels its own distance.
According to question

$\frac{x}{(S-3)\times\frac{5}{18}}$ =10 or,

18x = 50 × S − 150 .... .(i)
and

$\frac{x}{(S-5)\times\frac{5}{18}}$ =11

18x = 55 × S − 275 ..... (ii
Equating equation (i) and (ii)
50 × S − 150 = 55 × S − 275
Or, 5 × S = 125
or , S = 25kmph

Sol.118.(b)

As we know the man with faster speed will be ahead of the latter man.
Let the distance travelled in time t, by the two men with speed 5.5 km/h = x km & with speed 5km/h = y km.
So, x - y = 8.5
$\Rightarrow 5.5t - 5t = 8.5$
$\Rightarrow 0.5t = 8.5 \Rightarrow t = 17$
So, to be 8.5 km apart from each other, the time taken by them is 17 hours.

Sol.119.(a) D = S × T
Distance in both cases are the same and it depends on multiplication of speed and time.
20% = $\frac{1}{5}$
time reduced by 20% means that time changes from 5 to 4,
So, speed must be increased from 4 to 5,
% increase in speed = $\frac{1}{4} \times 100 = 25\%$

Sol.120.(a)
Let the speed of the train = x km/h
According to question,
$\frac{400}{x} - \frac{400}{x+10} = 2$
$\Rightarrow \frac{400(x+10)-400x}{x(x+10)} = 2$
$\Rightarrow \frac{4000}{x(x+10)} = 2$
$\Rightarrow x(x+10) = 2000 = 40 \times 50$
On comparing we get, x = 40 km/h

Sol.121.(d) let speed of veena = S_v
Speed of shruti = 4 km/h = $\frac{10}{9}$m/s
$\frac{182}{S_v} - \frac{200 \times 9}{10} = 30 \Rightarrow \frac{182}{S_v} = 210$
$\Rightarrow S_v = \frac{182}{210} \times \frac{18}{5} = 3.12$km/h

Sol.122.(c) Time equal in both cases
So $\frac{d_1}{d_2} = \frac{s_1}{s_2} = \frac{15}{14}$
$d_1 - d_2 = 1 \Rightarrow 10$km
Distance = $15 \Rightarrow 150$ km
Speed = $\frac{150}{30} = 5$ km/h

Sol.123.(c)
$\frac{S_R}{S_S} = \sqrt{\frac{T_S}{T_R}} \Rightarrow \frac{40}{S_S} = \sqrt{\frac{8}{2}}$
$\Rightarrow S_S = 20\ km/h$

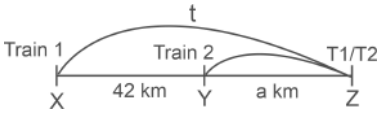
Sol.124.(a) As the trains meet each other at a distance of 130 km from one of the stations.
So the other train travels a distance of (250 - 130) = 120 km.
According to the question,
⇒ Ratio of speed of the two trains = 130 : 120 = 13 : 12.

Sol.125.(b)
Average speed = $\frac{Total\ distance\ travelled}{total\ time\ taken}$
$= \frac{40 \times 1 + 50 \times 2 + 60 \times 3}{6}$
$= \frac{320}{6} = 53.33$ km/h

Sol.126.(b) Speed = 50 km/h
Returning speed = $50 \times \frac{140}{100} = 70$ km/h
Average speed = $\frac{2 \times 50 \times 70}{120}$
= 58.33 km/h

Sol.127.(d) Distance = 6 km
Time = $\frac{3}{4}h = 45min$
Salesman covers 3 km in 30min.
Remaining time = 15 min = $\frac{1}{4}h$
Remaining Distance = 3 km
Speed For remaining distance = $\frac{3}{\frac{1}{4}}$
$= 3 \times 4 = 12\ km/h$

Sol.128.(a)



Time is equal for both the trains
$\frac{D_1}{D_2} = \frac{S_1}{S_2}$
$\Rightarrow \frac{42+a}{a} = \frac{32}{26}$
$\Rightarrow 1092 + 26a = 32a$
$\Rightarrow 1092 = 6a \Rightarrow a = 182\ km$

Sol.129.(b) The speed of Bus = 45 km/h
Speed difference of bus and truck (same direction) = $\frac{150}{30}$ = 5m/s = $5 \times \frac{18}{5}$ km/h
=18 km/h
45 - Truck speed = 18 km/h
Truck speed = 27 km/h

Sol.130.(d)
The original speed of the train is 60 km/h
Including the stoppages in the station, it travels at a speed of 45 km/h.
So, the train stops at the stations at the rate of = $\frac{60-45}{60}$ × 60 min
= 15 min/hour.

Sol.131.(a) Let the actual distance = D
According to the question :
$\frac{D}{9} = \frac{D+30}{15}$
15D = 9D + 270
6D = 270 ⇒ $D = 45$ km

Sol.132.(c) A map of a city is drawn on a scale of 1 : 50000.
The distance between two cities A and B on this map is 12 cm.
The actual distance between the two cities = 12 × 50000 cm = 600000 cm
So,
The distance between the two cities is 6km.

Sol.133.(b)
Distance is equal in both cases
$\frac{S_1}{S_2} = \frac{T_2}{T_1} \Rightarrow \frac{42}{S_2} = \frac{35}{45}$
$\Rightarrow 35\ s_2 = 45 \times 42$
$\Rightarrow S_2 = \frac{45 \times 42}{35} = 54\ km/h$

Sol.134.(b) Distance is the same
Then, speed is inversely proportional to the time.
Now , Ratio of the speed = $2 : \frac{1}{2} = 4 : 1$

Sol.135.(b) Relative speed =0.5 km/h
Time = distance/speed = $\frac{1.5}{0.5}$= 3 hours

Sol.136.(c) Let Ravikant Cycles x hours
According to Question :
$12.5 \times x + 3 \times (7 - x) = 40$
$\Rightarrow 12.5x + 21 - 3x = 40$
$\Rightarrow 9.5x = 19 \Rightarrow x = 2$

Sol.137.(a) Distance covered by thief from 3 pm to 4 pm = 50km
Relative speed = 70 - 50 = 20 km/h
Time taken by owner to catch the thief
$= \frac{50}{20} = 2.5\ hour = 2h\ 30min$
Time = 4 pm + 2h 30min = 6:30 pm

Sol.138.(a) ATQ,
T_1 Speed = 20 km/h, T_2 speed = 25 km/h
Difference speed of trains = 25 - 20
= 5 km/h
Time×speed = Distance
5 km/h × Time = 80 km (given)
Travel Time = 16 h
Distance covered by both trains = (20 + 25) × 16 = 720 km

Sol.139.(a) Average speed = $\frac{2 \times s_1 \times s_2}{(s_1 + s_2)}$
$= \frac{2 \times 30 \times 50}{80} = 37.5$ km/h

Sol.140.(c) $\frac{S_1}{S_2} = \sqrt{\frac{T_2}{T_1}}$
$\Rightarrow \frac{45}{S_2} = \sqrt{\frac{200\ min}{288\ min}} \Rightarrow \frac{45}{S_2} = \frac{10}{12}$

$\Rightarrow S_2 = \frac{45 \times 12}{10} = 54\ km/h$

Sol.141.(a)
Distance is equal in both cases.
$\Rightarrow \frac{S_1}{S_2} = \frac{T_2}{T_1} = \frac{30}{40} = \frac{3}{4}$
When man increases his speed he saves a total time of 10 + 5 = 15 min
Difference of time = 4 - 3 = 1 $\Rightarrow 15min$
$T_1 = 4 \times 15 = 60\ min = 1\ hour$
Distance = $S_1 \times T_1 = 30 \times 1 = 30\ km$

Sol.142.(d) Speed of Train
= $\frac{300}{5} \times \frac{18}{5}$km/h = 216 km/h

Sol.143.(d)
Let the length of the train = T
In 80 sec → T + 600
40 sec → T + 200

Diff = 40 sec → 400 m
In 40 sec train covers a distance of 400 m
in which the length of platform = 200 m
Length of train = 200 m

Sol.144.(a)
Let the distance covered = 2x km
A/Q,
$\frac{x}{40} + \frac{x}{50} = 18$
$\Rightarrow x(\frac{5+4}{200}) = 18 \Rightarrow \frac{9x}{200} = 18$
$\Rightarrow x = \frac{18 \times 200}{9} = 400\ km$
hence total distance = 800

Sol.145.(b) Speed of train = 80 km/h
In 60 min distance travelled = 80 km Or ,
In 3600 sec distance travelled = 80000 m
Or, In 36 sec distance travelled = 800 m
Time taken by train to complete 800 m
= 36 sec
800 m = 36 sec
(450 + 150 = 600 m) 600 m
= $\frac{36}{800} \times 600 = 27\ sec$

Sol.146.(c)
Given , distance = 28 km , time = 8h
Let the distance covered by foot = x km
According to the question ,
$\Rightarrow \frac{x}{2} + \frac{(28-x)}{6} = 8$
$\Rightarrow \frac{3x + 28 - x}{6} = 8 \Rightarrow x = 10\ km$

Sol.147.(a) Let distance = x km
Time taken to travel the distance = $\frac{3}{2}$ hrs
Speed = $\frac{D}{t} = \frac{x}{3} \times 2 = \frac{2x}{3} km/h$
If Parvez travel one fourth distance at $\frac{4}{5}$ $of\ the\ usual\ speed$
Distance = $\frac{x}{4}$,
Speed = $\frac{4}{5} \times \frac{2x}{3} = \frac{8x}{15}\ km/h$
Time taken = $\frac{x}{4} \times \frac{15}{8x} = \frac{15}{32}h$
Remaining Time = $\frac{3}{2} - \frac{15}{32}$
$= \frac{48-15}{32} = \frac{33}{32}h$
Remaining Distance = $\frac{3x}{4}$
Required Speed = $\frac{3x}{4} \times \frac{32}{33} = \frac{8x}{11}$
Required speed with respect to usual speed = $\frac{8x}{11} \div \frac{2x}{3}$
$= \frac{8x}{11} \times \frac{3}{2x} = \frac{12}{11}$

Sol.148.(d) Distance covered by A in 40 minutes = $\frac{40}{60} \times 40 = \frac{80}{3} km$
Relative speed = 50 - 40 = 10 km/h
Time = $\frac{80}{3 \times 10} = \frac{8}{3}h$
$= 2h\ 40\ min = 160\ min$

Sol.149.(d) Distance travelled by P in 4.5 sec = $\frac{250}{25} \times 4.5 = 45\ m$
Distance travelled by Q in 4.5 sec
= $\frac{250}{30} \times 4.5 = 37.5\ m$
P ahead of Q by = 45 - 37.5 = 7.5 m

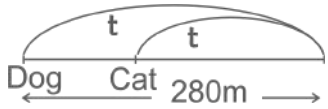
Sol.150.(d) 20 L = 150 km
30 L = $\frac{150 \times 30}{20} = \frac{4500}{20}$ = 225 km

Sol.151.(d)
Relative speed = 4 - 3 = 1 km/h
D = $1 \times 6 = 6\ km$

Sol.152.(d)
Let the time taken to go to park = x hour
Time taken to come back = (5 - x) hour
Distance will be equal in both cases
$20 \times x = 5(5 - x)$
$\Rightarrow 20x = 25 - 5x$
$\Rightarrow 25x = 25 \Rightarrow x = 1$
D = $20 \times 1 = 20\ km$

Sol.153.(a) Speed = 90 km/h
Train takes 1 hour to cover 90 km
= 3600 sec
90000 m = 3600 sec
900m = 36 sec
290 m = $\frac{36}{900} \times 290 = 11.6\ sec.$

Sol.154.(c)
Average speed of Ram = $\frac{2 \times 8 \times 12}{20}$
$= 9.6\ km/h$

Sol.155.(b)


Time is equal in both the cases
$\frac{D_D}{D_c} = \frac{S_D}{S_c} = \frac{24}{10} = \frac{12}{5}$
Difference of distance = 12 - 5 = 7 unit
7 unit = 280 m
Distance of cat = 5 unit
= $\frac{280}{7} \times 5 = 200\ m$= 0.2 km
Time = $\frac{0.2}{10} = \frac{1}{50}\ hour$
= $\frac{60}{50} = 1.2\ minutes$

Sol.156.(a)
Let the distance travelled in each part = D
A/Q,
$\frac{D}{25} + \frac{D}{30} = 11$
$\Rightarrow \frac{6D + 5D}{150} = 11 \Rightarrow \frac{11D}{150} = 11$
$\Rightarrow D = 150\ km$
Complete Distance = 2D = 300 km
Short Trick:
(Distance = speed × time)
Average speed = $\frac{2 \times S1 \times S2}{S1 + S1}$
= $\frac{2 \times 25 \times 30}{25 + 30}$
Now, Distance = Average speed × time
= $\frac{2 \times 25 \times 30}{25 + 30} \times 11$ = 300km

Sol.157.(c) Speed of man A = 3 kmph and speed of man B = 3.75 kmph
Let time taken by man A = (T + 0.5) hours and time taken by man B = T hours.
ATQ, $3 \times (T + 0.5) = 3.75 \times T$
3T + 1.5 = 3.75T
T= 2
Distance = 3.75×2 = 7.5 km

Sol.158.(b) Distance is equal in both cases
Ratio of time will be opposite to ratio of speed
Ratio of speed = $\frac{6}{8} = \frac{3}{4}$
Ratio of time = $\frac{4}{3}$
Difference of time = 1 unit = 40 minutes
3 unit = 120 minutes = 2 hour
D = $8 \times 2 = 16\ km$

Sol.159.(a) Let the Distance = 2D
$\frac{D}{7} + \frac{D}{6} = 13$
$\Rightarrow \frac{13D}{42} = 13 \Rightarrow D = 42\ km$
Distance = 84 km

Sol.160.(d) Diameter of wheel = $\frac{14}{11}\ m$
and 10 revolutions complete in 1 min
Perimeter of wheel = 2 π r
= 2 × $\frac{22}{7}$ × $\frac{14}{2\times11}$ = 4 m
In 60 seconds travel distance = 4 ×10
= 40m
In 1 second travel distance = $\frac{40}{60}$m/s
= $\frac{40}{60}$ × $\frac{18}{5}$ = 2.4 km/h
Speed in km/h = 2.4 km/h

Sol.161.(b) 1 cm = 9 km
2 cm = 9 × 2 = 18 km

Sol.162.(b)
Distance is constant for both conditions.

	Ist	:	2nd
Ratio of the Speed →	6	:	5
Ratio of the time →	5	:	6

1 unit (6 - 5) = 2 min
5 unit = 5 × 2 = 10 min

Sol.163.(b) Average Speed = $\frac{2ab}{a+b}$
a = 25, b = 4
⇒ $\frac{2\times25\times4}{25+4}$ = $\frac{200}{29}$ km/hr
Distance covered in 5 hour 48 mins
= $5\frac{4}{5}$ = $\frac{29}{5}$hour
Speed × time = $\frac{200}{29}$ × $\frac{29}{5}$ = 40 km
So, Distance of the post office from the village = $\frac{40}{2}$ = 20 km.

Sol.164.(b)
LCM of (300, 200 and 240) = 1200
Let the side of equilateral triangle = 1200 km
Average speed = $\frac{Total\ distance\ travelled}{total\ time\ taken}$
= $\frac{3600}{4+6+5}$ = $\frac{3600}{15}$ = 240 km/h

Sol.165.(a)
In 60 minutes train can travel = 45 km
45 km = 60 min = 3600 sec
$\frac{4}{5}\ km\ =\ \frac{3600\times4}{5\times45}=\ 64\ sec$

Sol.166.(a)
Distance of circular path = 10 km
Speed of A = 3 km/ h and
Speed of B = 2 km/h
They will meet again at the starting point when the distance should be multiple of both Speeds 3 and 2.
LCM of 2 and 3 = 6
Distance covered should be multiple of 10 also because they meet at the starting point.
Least multiple of 6 and 10 = 30 km
Time = $\frac{30}{3}$= 10 $hour$

Sol.167.(a)
Let the speed of the both trains = x and y
A/Q
$\frac{600}{x-y}$ =30 ⇒ $x\ -\ y\ =\ 20$___(1)
And $\frac{600}{x+y}\ =\ 6$⇒ $x\ +\ y\ =\ 100$ ___(2)
Solving equation (1) and (2), we get
x = 60 m/s and y = 40 m/s
x = 216 km/h and y = 144 km/h

Sol.168.(a) Ratio of the speed = 7 : 5
Speed of second train = 400 ÷ 4
= 100 kmph
Speed of first train = $\frac{7}{5}$ × 100= 140 km/h

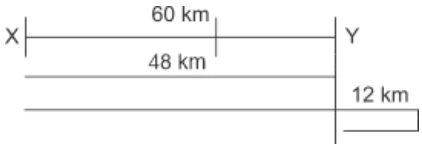
Sol.169.(a) Distance is fixed
Ratio of the speed between electric and bullet train = 20 : 27
Ratio of the Time between electric and bullet train = 27 : 20
Time taken by the electric train = 27 unit = 3h 45 min
Time taken by the bullet train = 20 unit
= $2\frac{7}{9}$ hours

Sol.170.(d)
Time taken to cover 600 km = ($\frac{600}{100}$) hrs
= 6 hrs = 360 min
Number of stoppages = $\frac{600}{75}$ - 1 = 7
as after traveling last 75 km train will reach the destination so there will be no stoppage time for last 75 km
Total time taken in stoppages = (3 × 7) min = 21 min
Total time taken = 360 + 21 = 381 min

Sol.171.(c) Let the distance = 100 km
Time taken =
$\frac{75}{60}+\frac{25}{40}=\frac{5}{4}+\frac{5}{8}=\frac{15}{8}$
Average speed = $\frac{100\times8}{15}=\frac{160}{3}$
$=\ 53\frac{1}{3}km/h$

Sol.172.(c)
Let the distance from home to office = D
A/Q, $\frac{D}{20}+\frac{D}{5}=\ 4$
⇒ $\frac{D+4D}{20}=\ 4$
⇒ $5D\ =\ 80 \Rightarrow D\ =\ 16\ km$

Sol.173.(c)



Time is equal for both A and B
$\frac{D_B}{D_A}=\frac{S_B}{S_A}$
⇒ $\frac{72}{48}=\frac{S_B}{S_A}$ ⇒ $\frac{3}{2}=\frac{S_B}{S_A}$
Difference of speed = 1 unit = 4 km/h
Speed of A = 2 unit = 8 km/h

Sol.174.(d) 25 minutes = 12 km
60 minutes - $\frac{12\times60}{25}$ = $\frac{144}{5}\ km/h$
When speed decreased by 5 km/h
Now , $\frac{144}{5}$ - 5 = $\frac{119}{5}$ km/h
Time taken = $\frac{12\times5}{119}\times\ 60$ = $30\frac{30}{119}$ min

Sol.175.(c) Distance - constant
So , Speed is inversely proportional to time .
Ratio of the time in both condition = 5 : 2
Ratio of the speed in both condition = 2 : 5
2 unit = 144 km/h
5 unit = $\frac{144\times5}{2}$ = 360 km/h

Sol.176.(a)
let speed be 4x, 7x, 3x respectively
Acc. to question,
$\frac{4x+7x+3x}{3}$ = 70 ⇒ x = 15
Average speed of car and train
= $\frac{4\times15+7\times15}{2}$ = $\frac{165}{2}$ = 82.5 km/h

Sol.177.(c)
For half of the distance S = 28 km/h
Half D = 42 km
Time taken = $\frac{42}{28}$ = 1.5 h
Remaining time for half of the distance = 4 - 1.5 = 2.5 h
S = $\frac{42}{2.5}=\frac{420}{25}=\ 16\frac{4}{5}$km/h

Sol.178.(b)
Let the speed of the train = x m/s
Relative speed = (x +4) m/s (1st person)
Relative speed = (x + 10) m/s (2nd person)
Distance covered by the train in both cases is equal to the length of the train.
(x+4)× $10\ =\ (x\ +\ 10)\ \times\ 8$
⇒ $10x\ +\ 40\ =\ 8x\ +\ 80$
⇒ $2x\ =\ 40 \Rightarrow x\ =\ 20\ m/s$

Sol.179.(d) Average speed = $\frac{2\times21\times24}{21+24}$
Total distance = $\frac{2\times21\times24}{21+24}$ × 5

= 112 km

Sol.180.(d)
Let the remaining distance be 7x
Then coverned distance be 5x
Total distance = 12x
Now given; 12x = 32 ⇒ x= $\frac{32}{12}$
So covered distance = 5x
= $\frac{32}{12}$ × 5 = $\frac{40}{3}$km
Time to cover $\frac{40}{3}$ km in 1hr20min($\frac{4}{3}$)hr
Speed = $\frac{\frac{40}{3}km}{\frac{4}{3}hr}$ = 10km/hr

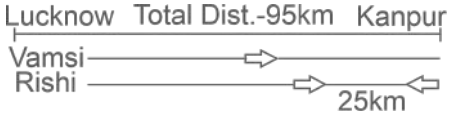
Sol.181.(d) Let initial speed = 15
Reduced speed = 15 - 1 = 14
In both cases time is equal
$\frac{D_1}{D_2} = \frac{S_1}{S_2} = \frac{15}{14}$
Change in distance = 1 unit = 10 km
Distance = 15 unit = 150 km
S = $\frac{150}{30} = 5\ km/h$

Sol.182.(c)
Total distance = $7 \times 104 = 728km$
Speed for 1st 4 hours = 118 km/h
Distance travelled = $118 \times 4 = 472$ km
Remaining distance = 728 - 472 = 256 km
Time remaining = 8 - 4 = 4hours
Speed for remaining distance = $\frac{256}{4}$
$= 64\ km/h$

Sol.183.(b) A train covers a distance of 35 km in 60 minutes .
It will take to cover 105 km is
= $\frac{60}{35} \times 105 = 180$ min

Sol.184.(a) A 100-m long train passes an electric post in 6 seconds.
The speed of the train is = $\frac{100}{6} \times \frac{18}{5}$
$= 60$ km/hr

Sol.185.(c) Distance = 95 km
Distance = speed × time
Time is the same for both.
So , distance is directly proportional to speed .



$$\frac{distance\ covered\ by\ vasmi\ (D_V)}{distance\ covered\ by\ rishi\ (D_R)}$$

$$= \frac{speed\ of\ vasmi\ (S_V)}{speed\ of\ Rishi(S_R)} = \frac{95+25}{95-25} = \frac{S_V}{S_R}$$

$\frac{120}{70} = \frac{S_V}{S_R} \Rightarrow \frac{12}{7} = \frac{S_V}{S_R}$
Now , difference between their speed = 5 unit = 5 km/h
Hence , speed of the Rishi = 7 unit
= 7 km/h

Sol.186.(b) Ratio of actual speed to reduced speed = 7 : 5
Ratio of time = 5 : 7
Time = 1h 40 min 48 sec
= 3600 + 2400 + 48 = 6048 sec
A/Q,
7 unit = 6048 sec
5 unit = $\frac{6048}{7} \times 5 = 4320\ sec$
Distance = 42 km = 42000 m
Speed = $\frac{42000}{4320} \times \frac{18}{5} = 35\ km/h$

Sol.187.(b) Let the distance between home to college = x km
A/Q,
$\frac{x}{2} + \frac{x}{3} = 5 \Rightarrow \frac{3x+2x}{6}$ = 5
$\Rightarrow 5x = 30 \Rightarrow x = 6km$

Sol.188.(b) 30 km/h = 500 meter/min
Time = $\frac{600}{500}$ = $1\frac{1}{5}$min

Sol.189.(d) 15.5 km → 5 hours
? km → 6 hours
? = $\frac{15.5 \times 6}{5}$ = 18.6 km

Sol.190.(d) In both cases time is equal
$\frac{D_1}{D_2} = \frac{S_1}{S_2} = \frac{60}{50} = \frac{6}{5}$
Difference of distance travelled by bus and car =1
1 unit = 50 km
Total Distance = 6 + 5 = 11unit = 550 km

Sol.191.(b) Total time = 65 min
Ratio of speeds = 10 : 15 : 20 = 2 : 3 : 4
Ratio of time = 12 : 8 : 6
A/Q,
12 + 8 + 6 = 26 unit = 65 minutes
1 unit = 2.5 minutes
12 unit = 30 minutes = 0.5 hour
Total distance = $3 \times 10 \times 0.5 = 15\ km$
Or
Let the total distance =3A
$\frac{A}{10} + \frac{A}{15} + \frac{A}{20} = \frac{65}{60}$
$\frac{6A+4A+3A}{60} = \frac{65}{60}$
13A = 65
A = 5
Total distance= 15km

Sol.192.(d) Distance = speed × time
43.75 km = (14 + 21)km/h × time
43.75 / 35 = time
Time = 1.25 h = 75 min.

Sol.193.(d)
In 20 sec P can run 300 m
In 4 sec P = $\frac{300}{20} \times 4 = 60\ m$
In 30 sec Q can run 300 m
In 4 sec Q = $\frac{300}{30} \times 4 = 40\ m$
Difference of distance covered by P and Q = 60 - 40 = 20 m

Sol.194.(a) Total time = 56 minutes
Two third of time = $\frac{112}{3} min$
Remaining time = $\frac{56}{3} min = \frac{56}{3 \times 60}$
$= \frac{14}{45} h$
Remaining distance = 8 - 4 = 4 km
Speed = $\frac{4 \times 45}{14} = \frac{180}{14} = 12\frac{6}{7}\ km/h$

Sol.195.(c)
Distance is same, so Ratio of Speed and Time will be inverse of each other
Ratio of the speed = 3 : 3.75 = 4 : 5
Ratio of the time = 5 : 4
Difference of the time between two men = 1
1 unit = 0.5 hours
4 unit = 2 hours
Distance = 2 × 3.75 = 7.5 km

Sol.196.(d) Distance is the same for both conditions .Let , the time be ' t ' hours when train move with a speed of 40 km/h
Time = (t + $\frac{1}{4}$) hours when train move with a speed of 35km/h
A/Q , 40 × t = 35 ×[t + $\frac{1}{4}$]
t = $\frac{7}{4}$hours
We know that , distance = speed × time
So , total distance = 40 × $\frac{7}{4}$ = 70 km

Alternate method,
Speed 8 7
Time 7 8
Difference in time=1unit
1unit=15min
8unit= 120min=2hour
Distance =2×35=70km

Sol.197.(d)
Total distance travelled in a week days
$= 5 \times (5 + 3 + 2.5) + 2 \times 20$
$= 5 \times 10.5 + 40$
= 52.5 + 40 = 92.5

Sol.198.(c) Distance is equal for both
$\frac{S_1}{S_2} = \frac{T_2}{T_1} = \frac{6}{7.5} = \frac{4}{5}$

Difference of time = 1
A/Q,
1 unit = 1h 4 min
$T_1 = 5\ unit\ =\ 5h\ 20min$
$= (5\ + \frac{1}{3})h = \frac{16}{3}h$
Distance = $6 \times \frac{16}{3}$ = 32 km

Sol.199.(c)
Distance is same for both condition
Ratio of the speed = 3 : 16
Ratio of the time = 16 : 3
16 unit = 8 hours
3 unit = $\frac{8 \times 3}{16}$ = 1.5 hours

Sol.200.(a)
Relative speed = 9 + 11 = 20 km/h
D = 2 km
Time = $\frac{2}{20} = \frac{1}{10}h\ = 6\ min$

Sol.201.(b) Minutes per hour does he stop
= $\frac{60-50}{60} = \frac{1}{6}$hour = 10 mins

Sol.202.(c)
Let the speed of train = x km/h
Speed of horse = $\frac{x}{3}\ km/h$
Speed of steamer = $\frac{x}{1.5} = \frac{2x}{3}\ km/h$
A/Q,
$\frac{120 \times 3}{2x} + \frac{450}{x} + \frac{60 \times 3}{x} = 13.5$
$\Rightarrow \frac{360 + 900 + 360}{2x} = 13.5$
$\Rightarrow \frac{1620}{2x} = 13.5$
$\Rightarrow x = \frac{1620}{27} = 60\ km/h$

Sol.203.(b)
Distance travelled by both is equal
$\frac{S_1}{S_2} = \frac{T_2}{T_1} = \frac{15}{16}$
Difference of time = 16 - 15 = 1 unit
A/Q,
1 unit = 16 min
T_2 =15 unit = 240 min = 4 h
Distance = $16 \times\ 4\ = 64\ km$

Sol.204.(b) Let the original speed of the car = x km/h
Increased speed = x + 5 km/h
A/Q,
$\frac{300}{x} - \frac{300}{x+5} = 2$
$\Rightarrow 300\left(\frac{x+5-x}{x(x+5)}\right) = 2$
$\Rightarrow x(x\ +\ 5)\ =\ 750$
$\Rightarrow x(x\ +\ 5)\ =\ 25\ \times\ 30$
$x\ =\ 25\ km/h$

Sol.205.(d) The average speed from A to B = $\frac{300}{\frac{10}{3}}$ = 90 km/h
Average speed for the entire trip
= $\frac{300+300}{10/3\ +\ 25/6} = \frac{600 \times 6}{45}$ = 80 km/h
The average speed from A to B exceeds the average speed for the entire trip
= 90 - 80 = 10 km/h

Sol.206.(d) Given , Time = 4 : 30 pm to 10 : 30 pm = 6 hours and
Average speed = 75 km/h
Now, distance = speed × time
Distance = 75 × 6 = 450 km

Sol.207.(c)
Distance travelled by Sachin = 30 km
Distance travelled by Anil = 70 km
Time is same, therefore
Speed of Sachin : Speed of anil = 3 : 7
(7-3) unit = 6 kmph
1 unit = 1.5 kmph
Speed of sachin = 3 unit = 3 × 1.5
= 4.5 kmph

Sol.208.(c)
Distance between two poles = 50 m
Total distance between 21 poles
= $20 \times\ 50\ =\ 1000\ m$ = 1 km
Time taken = 1 minute
Speed of the train = 60 km/h

Sol.209.(a)

	Time	Speed
A -	8 : 30	45 km/h
B -	8 : 45	54 km/h

60 minute = 45
1 minute = 45/60
For 15 minute = $\frac{45}{60}$ × 15
Distance = $\frac{45}{4}km$
Relative speed = 54 - 45 = 9 km/h
Time = $\frac{Distance}{speed}$ = $\frac{45}{9 \times 4}$ = $\frac{5}{4}$ hr
Distance from city A = $54 \times \frac{5}{4}$
= 67.5 km/h

Sol.210.(c)
Time taken to travel 30 km = $\frac{30}{6}$ = 5h
Average speed = $\frac{Total\ distance\ travelled}{Total\ time\ taken} = \frac{30+40}{5+5} = \frac{70}{10}$
$= 7\ km/h$

Sol.211.(c)
Speed of the First train = 60 km/h and speed of the 2nd train = 25m/s
= 90 km/h
speed of the second train with respect to a man sitting in the first train
= 90 + 60 = 150 km/h
(note - speed will be added because moving on opposite direction)

Sol.212.(b) Let the length of the train = l m
The train takes 15s to pass completely through a station platform 50 m long and 10 s through another station platform 20 m long.
$\Rightarrow \frac{50+l}{15} = \frac{20+l}{10} \Rightarrow l = 40$
So, the length of the train is 40 m.

Sol.213.(d)
The radius of a wheel is = r = 70cm.
So, the wheel goes = 2πr = $2 \times \frac{22}{7} \times 70$
$= 440\ cm$ in one revolution.
The wheel makes 10 revolutions in 5 seconds covering distance, then the total distance = 440×10 = 4400 cm = 44m
Then the speed of the wheel is = $\frac{44}{5}m/s$
$= \frac{44}{5} \times \frac{18}{5} = 31.68$ km/hr.

Sol.214.(a) Two trains, 145 m and 155 m in length, run on Parallel tracks. One train runs at the speed of 32 km/h and the other at 40 km/h.
[both trains run in opposite direction]
So, their relative velocity = (32 + 40)
= 72 km/h = $72 \times \frac{5}{18} = 20$m/sec.
Then the time required for them to cross each other = $\frac{(145+155)}{20} = \frac{300}{20}$ = 15 sec

Sol.215.(a)
Speed is same for both condition
Ratio of the time = 3 : 5
Ratio of the distance = 3 : 5
3 unit = $10\frac{1}{5}$km
5 unit = $\frac{51 \times 5}{5 \times 3}$= 17 km

Sol.216.(d) Given that,
Walk + Ride = 5 h 45 min ----- (i)
Ride + Ride = 3 h 45 min
→ Ride = 112.5 min
from equation (i)
Walk = 345 min - 112.5 min = 232.5
The time he will take to walk both the ways
= 2 × 232.5 min = 465 min = 7 h 45 min

Sol.217.(a) Speed of Satish = 75 km/h
In 1 hour Satish travel 75 km
Distance between both Satish and Raman = 75 km
Relative speed = 90 - 75 = 15km/h

Time = $\frac{75}{15} = 5\ hour$

Meeting time = 3 p.m + 5 h = 8 p.m.

Sol.218.(d) Let the total distance from Agra to Delhi = 7 km

Here, both the buses take 7 hours to cover this distance.

So, speed of both the buses = 1 : 1

Relative speed = 1 +1 = 2 km/hr

Now, Bus 1 starts 3 hours before Bus 2,

Distance travelled by bus 1 in first 3 hours = 3 km

Now, remaining distance between the two buses = 4 km

Time taken to meet them = $\frac{4}{1+1} = 2$ hr

Hence, Both the buses will meet at

= 8 + 2 = 10 AM morning

Sol.219.(a) Distance = speed × time

Distance = 48 × $\frac{50}{60}$ = 40 km

Now, new time = 40 minutes

New Speed → $\frac{40 \times 60}{40} = 60\ km/hr$

Sol.220.(b)

Given, radius of the wheel = $\frac{7}{4}m$

Circumference of the wheel

→ 2π r = 2 × $\frac{22}{7}$ × $\frac{7}{4}$ = 11 m

Now, number of revolution

= $\frac{22000}{11}$ = 2000

Sol.221.(c) Average speed = $\frac{2 \times S1 \times S2}{S1 + S2}$

$= \frac{2 \times 5 \times 3}{5+3} = \frac{2 \times 15}{8} = 3.75$ km/h

Sol.222.(b)

Let the speed of the man = x km/hr

Relative speed → (20 + x) km/hr

Distance covered by buses in 10 minutes = Distance covered by a man coming from opposite direction in 8 minutes

A/Q ,

$\frac{10}{60} \times 20 = \frac{8}{60} \times (20 + x)$

$\frac{10}{3} = \frac{8}{3} + \frac{2x}{15}$

$\frac{2x}{15} = \frac{2}{3} \Rightarrow x = 5$

Hence, the speed of the man = 5 km/hr

Sol.223.(b) Let the speed of the train = x m/sec

A/Q ,

$\frac{120+100}{x}$ = 10

$220 = 10x$

speed of the train $(x) = 22$ m/s

= $\frac{18}{5} \times 22$ = 79.2 km/hr

Sol.224.(b) Distance between P and Q = 400 miles

Speed of P = 50 mph and speed of Q = 40 mph

Distance covered by P in 75 minutes

= $50 \times \frac{75}{60} = 62.5\ miles$

Remaining distance = 400 - 62.5

= 337.5 miles

Now, time taken to meet both of the train

= $\frac{337.5}{50+40} = 3.75$

Total time taken to meet both the car P and Q = 3.75 + 1.25 = 5 hours

Sol.225.(b) Length of the train = 110 m, and length of the bridge = 132 m

A/Q ,

$\frac{110+132}{72} \times \frac{18}{5} = \frac{242}{20} = 12.1\ seconds.$

Sol.226.(b) If distance is constant then

speed $\propto \frac{1}{Time}$

Ratio of speed → 18 : 12

Ratio of time → 12 : 18 or **2 : 3**

Sol.227.(b) Speed of the first train = 60 km/hr

Speed of the second train = 90 km/hr

Relative speed = 90 + 60 = 150 km/hr

Time taken to cross faster train by slower train = $\frac{1100+900}{150} \times \frac{18}{5}$ = 48 seconds

Sol.228.(c) If distance is constant then,

speed $\propto \frac{1}{time}$

Speed → 4x : 3x

Time → 3x : 4x

So difference in time = 4x - 3x = 15

⇒ x =15

So time taken to reach the workplace by normal speed = 3x

⇒ 3 × 15 = 45 minute

Sol.229.(b) LCM of 20 and 12 = 60

So they meet = $\frac{120}{60}$ = 2 points

Sol.230.(d) Total distance covered by the faster train = (200 + 150) = 350m

Relative speed of the trains

→ $(45 - 40) \times \frac{5}{18} = \frac{25}{18}$ m/s

Therefore,total time taken to cross each other = $\frac{Total\ distance}{relative\ speed\ of\ the\ trains}$

→ $\frac{350 \times 18}{25}$ = 252 seconds

Sol.231.(c) Distance between station A and B = 110 km

Distance traveled by train A in 1 hour

= 20 × 1 = 20 km

Relative speed of two trains moving in opposite direction = $(20 + 25)$

= 45 km/h

The time taken to travel remaining distance by both trains

= $\frac{(110-20)}{45}$ = 2 hours

Time at which both trains will meet

= $(8\ A.M. + 2\ Hours)$ = 10 A.M.

Sol.232.(a) Let the speed of vehicles be 7x and 8x .

According to question ,

$\frac{400}{8x}$ = 5hr. → x = 10

Then speed of 1st vehicles (7x) = 7 × 10 = 70 km/h

Sol.233.(a) Let the speed of boat in still water be x km/h

and the speed of current be y km/h .

Speed against current → $(x - y)$

Speed along current → $(x + y)$

According to question ,

$\frac{24}{(x-y)}$ = 6 → $(x - y) = 4$ ..... e.q .(1)

$\frac{36}{(x+y)}$ = 6 → $(x + y) = 6$ ..... e.q .(2)

On solving e.q .(1) and e.q .(2) , we get

Speed of water current (y) = 1 km/h

Sol.234.(b) Let the length of the Platform be x meter.

Speed of Train → 54 × $\frac{5}{18}$ = 15 m/s

Length of train → 15 × 20 = 300 meters.

Now ,15 m/s = $\frac{300+x}{36}$

x = 540 - 300 = 240 meters.

Sol.235.(c) Distance traveled between P and Q = 50 km/h × $\frac{1}{2}$ = 25 km

Distance traveled between Q and R = 60 km/h × $\frac{20}{60}$ = 20km

So , average speed

= $\frac{total\ distance\ travelled}{total\ time\ taken} = \frac{45 \times 60}{50}$

= 54 km/h

Sol.236.(a) Speed of the first train

→ $\frac{120}{10}$ = 12 m/sec

and Speed of the second train

→ $\frac{120}{12}$ = 8 m/sec

Now , their relative speed → (8 + 12)

= 20m/sec

Total time taken by the trains to cross each other → $\frac{total\ length}{relative\ speed}$

$\frac{120+120}{20}$ = 12 second

Sol.237.(c) We know that of speed $\propto \frac{1}{T}$

$\frac{S1}{S2} = \sqrt{\frac{T2}{T1}} \Rightarrow \frac{S1}{S2} = \sqrt{\frac{16}{9}}$

$= \frac{S1}{S2} = \frac{4}{3}$

Sol.238.(b) According to the question

$\frac{D}{(S_1 - S_2)} = 2 \times \frac{D}{(S_1 + S_2)} \Rightarrow \frac{S_1}{S_2} = \frac{3}{1}$

Sol.239.(d) If P and Q are running around a circular track with speed 15 m/s and 20 m/s then relative speed $= (20 - 15)$
= 5 m/min
Meeting time of both at starting point
$= \frac{240}{5}$ = 48 minute

Sol.240.(a) Sum of the length of train (total distance) = 100 + 120 = 220 m
Relative speed of train (18 + 15) = 33 m/s
Time = $\frac{220}{33}$ = 6.7 s

Sol.241.(a) Let , the length of another train = x meter
Relative speed of train
→ 200 km/h × $\frac{5}{18} = \frac{500}{9}$ m/s
According to question ,
$\frac{270 + x}{\frac{500}{9}} = 9 \rightarrow \frac{9(270 + x)}{500} = 9$
270 + x = 500 → x = 230m

Sol.242.(a) Distance = Speed ×Time
Here Distance is constant
ATQ
Latter's speed = $\frac{25 \times 20}{25}$ = 20 km/h

Sol.243.(d) Let , the speed of train is x m/s, speed of man
= 5 km/h × $\frac{5}{18} = \frac{25}{18}$ m/s
A.T.Q,
$\frac{125}{\left(x - \frac{25}{18}\right)} = 10 \rightarrow \frac{125 \times 18}{(18x - 25)} = 10$
$(180x - 250) = 2250 \rightarrow 180x = 2500$
x = $\frac{250}{18}$ m/s × $\frac{18}{5}$ = 50 km/h

Sol.244.(d) Ratio of the speed of train → $(Original\ to\ After)$ = 1 : 2
Speed $\propto \frac{1}{time}$
∴ Ratio of the Time taken by the train → $(Original\ to\ After)$= 2 : 1
According to the question,
Time (2 - 1)unit = 1 unit
→(2h + $\frac{1}{4}$)hr ⇒ $\frac{9}{4}$hr
2 unit →($\frac{9}{4}$ × 2)hr = $\frac{9}{2}$hr
Total distance covered by the train with the time of $\frac{9}{2}$hr and the speed of
$40km/h \Rightarrow \frac{9}{2} \times 40 \Rightarrow 180$ Km

Sol.245.(d) Total time taken by P and Q in the journey→ (1+ $\frac{24}{60}$)= $\frac{7}{5}$hr
Let the time taken by cyclist with the speed of 4km/h be → x
then , time taken by cyclist with the speed of 5km/h be → $\frac{7}{5} - x$
Ratio of distance covered in first and second part of the journey be → 2 : 1
Therefore,
Distance = speed × time ⇒ $\frac{2}{1}$
$= \frac{4x}{5 \times (\frac{7}{5} - x)}$ → 14 - 10x = 4x
⇒ x = 1 hour

Sol.246.(d) Relative speed of P and Q = 50 m/s
Time taken by P and Q when they meet first time = $\frac{400}{10 + 40}$ = 8 sec
When they meet 2nd time both of them speed 20 m/s
So time taken by them = $\frac{400}{40}$ = 10 sec
When they meet 3rd time their speed P and Q will become 40 m/s and 10m/s
Time taken by them = $\frac{400}{50}$ = 8 sec
So, total time taken by them
$= (8 + 10 + 8)$ = 26 sec

Sol.247.(a) Let, the initial speed of train = x km/hr , now speed = $(x + 5)$
A.T.Q,
$\frac{300}{x} - \frac{300}{(x + 5)} = 2$
$\frac{(x + 5) - x}{(x + 5)x} = \frac{2}{300} \rightarrow (x + 5)x = 750$
$x^2 + 5x - 750 = 0$
$x^2 + 30x - 25x - 750 = 0$
$x(x + 30) - 25(x + 30) = 0$
$(x + 30)(x - 25) = 0$
$x = 25$, $x \neq (-30)$ because speed cannot be negative

Sol.248.(b) According to the question,
Time taken by A to complete the 100m race → $\frac{100}{5 \times \frac{5}{18}}$ = 72 second
Distance covered by B → 100 − 8 = 92 m.
Time taken by B → 72 + 8 = 80 sec.
Therefore the speed of B →$\frac{92}{80} \times \frac{18}{5}$
= 4.14 km/h

Sol.249.(c) Formula :- Speed ∝ Distance
Ratio of Speed → 4 : 9
Ratio of Distance → 4 : 9
Extra distance covered (5 units)
= 7.5 miles
Initial distance (4 units)
= $\frac{7.5}{5}$× 4 = 6 miles

Sol.250.(c) Time taken to cross the bridge by train
= $\frac{(360 + 140) \times 18}{45 \times 5}$ = 40sec.

Sol.251.(a) Distance = speed × time
Total distance = 10 + 10 = 20 km
Average speed = $\frac{total\ distance}{total\ time}$
$= \frac{10 + 10}{\frac{10}{4} + \frac{10}{2}} = \frac{20}{2.5 + 5}$
$= \frac{20}{7.5} \approx 2.67$ km/h

Sol.252.(b) According to question,
Speed of A = 2 rounds per hours
Speed of B = 3 rounds per hours
Relative speed = (3 + 2)
= 5 rounds per hour
So they will cross each other 5 times in one hours ,
Total time from 8AM to 9.30 AM
= $\frac{3}{2}$ hours
Total no. of time they cross each other
→ $\frac{3}{2}$ × 5 = 7.5 ≈ 7 times

Sol.253.(c) Distance = speed × time
Ratio → initial : final
Speed → 4 : 3
Time → 3 : 4

Difference in time (1 unit) = 2hrs.
Initial time (3 units) = 3 × 2 = 6 hours

Sol.254.(c) Speed = $\frac{Distance}{Time}$
Let the speed of trains be x m/s .
Then , relative speed = x + x = 2x
Relative speed = $\frac{total\ distance}{total\ time}$
= $\frac{120 + 120}{12}$ = 20 m/s
Speed of each train (x)
→ 10 × $\frac{18}{5}$ = 36 km/h

Sol.255.(a)
Distance between M and N = 960 km
Relative speed of two trains → $\frac{distance}{time}$
$= \frac{960}{8} = 120\ km/hr$
Now, the speed of the other train
= 120 − 54 = 66 km/hr.

Sol.256.(c) Ratio → initial : final
Speed → 10 : 9
Time → 9 : 10
Difference in time (1 unit) = (2:34 – 2:28) = 6 minutes.
So, original time (9 units) → 54 minutes.
Required time = (2:28) – 54 minutes
= 1 : 34 pm

Sol.257.(b) Total distance = 50 km
Let the distance covered on foot be x km.
And the distance covered by bullock cart = (50 - x) km
ATQ, $\frac{x}{4}+\frac{50-x}{12}=7.5$ hours.
$\frac{3x+50-x}{12}=7.5$
$2x+50=90 \Rightarrow x=20$
So, distance travelled by foot = 20 km

Sol.258.(d) Here , distance is constant ,
Ratio → Original : New
Speed → 5 : 4
Time → 4 : 5

Time difference(5 - 4) = 1 unit
→18 minutes
Then, initial time (4 units) → $72\ minutes$

Sol.259.(b)
Average speed = $\frac{Total\ distance}{Total\ time}$
$=\frac{30+30}{5+3}=\frac{60}{8}=7.5\ m/s$

Sol.260.(a)
Relative speed = 20 + 30 = 50 m/s
Time when the both trains meet = $\frac{2000}{50}$
$=40\ seconds$

Sol.261.(b)
Speed of the bus = 72 km/h = $72\times\frac{5}{18}$
$=20\ m/s$
In 1 sec the bus can cover 20 m
Then, in 5 sec the bus will cover 100 m

Sol.262.(b)
Total running distance = 7.5 km
X run $\frac{25}{6}\ km$ in the morning
So, he runs in the evening
→ $\frac{75}{10}-\frac{25}{6}=\frac{10}{3}\ km$

Sol.263.(a) Here , distance is constant .
Speed $\propto \frac{1}{Time}$
Ratio of Speed → X : Y = 50 : 75 or 2 : 3
Ratio of time → 3 : 2
Difference in time (1 unit) = 2hr
Initial time taken (3 units) = 6hr
Distance b/w A and B → 50×6 = 300 km

Sol.264.(b) Speed of bullet = $\frac{90}{0.2}$
= 450 m/s = 450 × $\frac{18}{5}$ = 1620 km/h

Sol.265.(b)
Total distance covered by train in 50 min
= 64 × $\frac{50}{60}$ = $\frac{320}{6}$ km
Now, to cover the same distance in 40 minutes .
so , the new speed of train
= $\frac{320}{6}\times\frac{60}{40}$ = 80 km/h
the increment in the speed = (80–64)
= 16 km/h

Sol.266.(a) Distance between two city C and D = 540 km
Time taken by slower car → $\frac{540}{90}$ = 6 hrs.
Therefore, speed of the faster car
→ $\frac{540}{(6-1)}$ = 108 km/h

Sol.267.(a) Let the length of train = x
Case 1:-
Speed of train = $\frac{x}{27}$ ..... (eq-1)
Case 2:-
Speed of train
$=\frac{length\ of\ train\ +\ length\ of\ bridge}{total\ time}$
$=\frac{x\ +\ 650}{92}$ ... (eq-2)
Equating the value of speed of train:-
$\frac{x+650}{92}=\frac{x}{27}$
⇒ 27 × 650 = 65x ⇒ x = 270 m

Sol.268.(a) Speed = $\frac{Distance}{Time}$
Distance = 33 m/s × 11s = 363 m

Sol.269.(b) Case 1:-
Let the length of train = x
Speed of train = $\frac{x}{40}$ ..... (eq-1)
Case 2:-
Speed of train
$=\frac{length\ of\ train+distance\ of\ bridge}{total\ time}$
$=\frac{x+650}{105}$ ..... (eq-2)
Equating the value of speed of train :-
$\frac{x+650}{105}=\frac{x}{40}$
⇒ 40 × 650 = 65x ⇒ x = 400 m

Sol.270.(c) Let the length of train = x
Case 1:-
Speed of train = $\frac{x}{39}$ ..... (eq 1)
Case 2:-
Speed of train
$=\frac{length\ of\ train\ +\ length\ of\ bridge}{total\ time}$
$=\frac{x+740}{113}$ ..... (eq 2)
Equating the value of speed of train:-
$\frac{x+740}{113}=\frac{x}{39}$
⇒ 39 × 740 = 74x ⇒ x = 390 m

Sol.271.(b) Here distance is constant , then ratio of speed is inversely proportional to time
Speed → 8 : 7
Time → 7 : 8
Change in time ⇒ 1 unit = 22 minutes
Then , 7 unit = 154 minutes

Sol.272.(a) Case 1:-
Speed of train = $\frac{x}{33}$ ..... (eq .1)
Case 2:-
Speed of train
$=\frac{length\ of\ train\ +\ length\ of\ bridge}{total\ time}$
$=\frac{x+650}{98}$ ..... (eq .2)
Equating the value of speed of train:-
$\frac{x+650}{98}=\frac{x}{33}$
⇒ 33 × 650 = 65x ⇒ x = 330 m

Sol.273.(c) Speed = $\frac{Distance}{Time}$
Distance = 27 m/s × 8 s = 216 m

Sol.274.(a) Here , distance is constant so the ratio of speed will be inversely proportional to time ..
Speed → 6 : 5
Time → 5 : 6
Change in time = 1 unit = 33 minutes
Then , 5 unit = 165 minutes

Sol.275.(c) Case 1:-
Speed of train = $\frac{x}{23}$ ..... (eq .1)
Case 2:- Speed of train
$=\frac{length\ of\ train\ +\ length\ of\ bridge}{total\ time}$
$=\frac{x+260}{49}$ ..... (eq .2)
Equating the value of speed of train:-
$\frac{x+260}{49}=\frac{x}{23}$
⇒ 23 × 260 = 26x ⇒ x = 230 m

Sol.276.(a) $Speed = \frac{Distance}{Time}$
We know that when distance is constant then, ratio of time is inversely proportional to the ratio of speed .
$T_1 : T_2$ = 15 : 16
Then , $S_1 : S_2$ = 16 : 15

Sol.277.(b) As we know that sides of the equilateral are equal.
Here, Distance is constant , let it be x km.

Average speed = $\frac{total\ distance}{total\ time}$

= $\frac{3x}{\frac{x}{20}+\frac{x}{24}+\frac{x}{30}}$ = $\frac{3x\ \times\ 120}{6x+5x+4x}$

= $\frac{3x\ \times\ 120}{15x}$ = 24 km/h

Sol.278.(c) Here distance is constant , then ratio of speed is inversely proportional to time
Speed → 7 : 6
Time → 6 : 7
Change in time ⇒1 unit = 14 minutes
Then , 6 unit = 84 minutes = 1 hr. 24 minutes

Sol.279.(a) Here distance is constant , then ratio of speed is inversely proportional to time
Speed → 20 : 24
Time → 24 : 20
Change in time = 4 unit = 17 minutes
Now, 24 unit = 102 minutes = $\frac{17}{10}$hr.
Distance = speed × time = 20 × $\frac{17}{10}$
= 34 km

Sol.280.(c) Here distance is constant , then ratio of speed is inversely proportional to time
Speed → 24 : 30
Time → 30 : 24
Change in time ⇒6 unit = 19 minutes
Now, 30 unit = 95 minutes = $\frac{19}{12}$hr.
Distance = speed × time = 24 × $\frac{19}{12}$
= 38 km

Sol.281.(a) $Speed\ =\ \frac{Distance}{Time}$
We know that when distance is constant then, ratio of time is inversely proportional to the ratio of speed .
$T_1 : T_2$ = 13 : 21
Then , $S_1 : S_2$ = 21 : 13

Sol.282.(b) As we know that sides of an equilateral triangle are equal.
Here, Distance is constant , let distance = x km.

Average speed = $\frac{total\ distance}{total\ time}$

= $\frac{3x}{\frac{x}{36}+\frac{x}{30}+\frac{x}{45}}$

$\frac{3x\times 180}{5x+6x+4x}$ = $\frac{3x\times 180}{15x}$ = 36 km/h

Sol.283.(d) Case 1:-
Speed of train = $\frac{length\ of\ train+length\ of\ bridge}{total\ time}$ = $\frac{x+408}{61}$ ..... (eq .1)

Case 2:- Speed of train = $\frac{x}{27}$ ..... (eq .2)

Equating the value of speed of train:-
$\frac{x+408}{61}$ = $\frac{x}{27}$
⇒ 27 × 408 = 34x ⇒ x = 324 m

Sol.284.(c) Here distance is constant , then ratio of speed is inversely proportional to time
Speed → 15 : 20
Time → 20 : 15
Change in time = 5 unit = 9 minutes
Now, 20 unit = 36 minutes = $\frac{3}{5}$ hr.
Distance = speed × time = 15 × $\frac{3}{5}$
= 9 km

Sol.285.(a) Case 1:-
Speed of train
= $\frac{length\ of\ train\ +\ length\ of\ bridge}{total\ time}$
= $\frac{x+204}{57}$ ..... (eq .1)
Case 2:-
Speed of train = $\frac{x}{23}$ ..... (eq .2)
Equating the value of speed of train:-
$\frac{x+204}{57}$ = $\frac{x}{23}$
⇒ 23 × 204 = 34x ⇒ x = 138 m

Sol.286.(b) Here distance is constant , then ratio of speed is inversely proportional to time
Speed ⇒ 21 : 20
Time ⇒ 20 : 21
Change in time ⇒1 unit = 6 minutes
Then , 20 unit = 120 minutes

Sol.287.(b) Here distance is constant , then ratio of speed is inversely proportional to time
Speed → 45 : 60
Time → 60 : 45
Change in time = 15 unit = 9 minutes
Now, 60 unit = 36 minutes = $\frac{3}{5}$ hr.
Distance = speed × time
= 45 × $\frac{3}{5}$ = 27 km

Sol.288.(b) As we know that sides of an equilateral triangle are equal.
Here, Distance is constant , let distance = x km.

Average speed = $\frac{total\ distance}{total\ time}$

= $\frac{3x}{\frac{x}{12}+\frac{x}{24}+\frac{x}{10}}$

$\frac{3x\times 120}{10x+5x+12x}$ = $\frac{3x\times 120}{27x}$ = $\frac{120}{9}$
= 13.33 km/h

Sol.289.(d) Here distance is constant , then ratio of speed is inversely proportional to time

	Usual	:	New
Speed →	16	:	15
Time →	15	:	16

Change in time ⇒1 unit = 6 minutes
Then , usual time = 15 unit = 90 minutes

Sol.290.(a) Case 1:-
Speed of train
= $\frac{length\ of\ train\ +\ length\ of\ platform}{total\ time}$
= $\frac{x+238}{51}$ ..... (eq .1)
Case 2:-
Speed of train = $\frac{x}{17}$ ..... (eq .2)
Equating the value of speed of train:-
$\frac{x\ +\ 238}{51}$ = $\frac{x}{17}$
⇒ 17 × 238 = 34x ⇒ x = 119 m

Sol.291.(a) Here distance is constant, then ratio of speed is inversely proportional to time
Speed → 15 : 20
Time → 20 : 15
Change in time = 5 unit = 4 minutes
Now, 20 unit = 16 minutes = $\frac{4}{15}$ hr.
Distance = speed × time = 15 × $\frac{4}{15}$
= 4 km

Sol.292.(b) Case 1:- Speed of train
= $\frac{distance\ of\ train+distance\ of\ bridge}{total\ time}$
= $\frac{x+204}{52}$ ..... (eq .1)

Case 2:- Speed of train = $\frac{x}{18}$ ..... (eq .2)

Equating the value of speed of train:-
$\frac{x+204}{52}$ = $\frac{x}{18}$
⇒ 18 × 204 = 34x ⇒ x = 108 m

Sol.293.(a) Let the speed of trains A and B be x km/hr
Then distance between stations = 10x km
So, the relative speed of train when travels in opposite direction = 2x km/hr
Distance covered by train A in 2 hrs = 2x
Remaining distance = 10x - 2x = 8x
Time of meeting = $\frac{8x}{2x}$ = 4 hrs
So, the required time = 7 + 4 = 11 a.m

Sol.294.(b) Let they meet each other after 't' time and speed of Paul = b km/hr
ATQ,
6 × b = 30 × t ⇒ b = 5t
Again, 13.5 × 30 = bt
⇒ 405 = b × $\frac{b}{5}$ ⇒ 405 × 5 = b^2
⇒ 2025 = b^2 ⇒ b = $\sqrt{2025}$ = 45 km/hr
Alternate method:
Let the speed of Peter be X and speed of Paul be Y
We know that after meeting
$\frac{X}{Y} = \sqrt{\frac{t2}{t1}}$
⇒ $\frac{30}{Y} = \sqrt{\frac{6}{13.5}}$ ⇒ $\frac{30}{Y} = \sqrt{\frac{4}{9}}$
⇒ $\frac{30}{Y} = \frac{2}{3}$
So , speed of Paul (Y) = 45 km/h

Sol.295.(b)
Let the original speed of Kishan be x
Then, new speed of Kishan = (x - 2) km/hr
ATQ,
120 = $\frac{x(x-2)}{x-(x-2)}$ × 3
⇒ 40 = $\frac{x(x-2)}{2}$ ⇒ 80 = x^2 - 2x
⇒ x^2 - 2x - 80 = 0
⇒ x^2 - 10x + 8x - 80 = 0
⇒ x(x - 10) + 8(x - 10) = 0
⇒ (x + 8)(x -10) = 0 ⇒ x = 10 or - 8
So, the speed of Kishan = 10 km/hr

Sol.296.(c) Required distance
= $\frac{40 \times 36}{40-36} \times \frac{(3+1)}{60}$
= $\frac{1440}{4} \times \frac{4}{60}$ = 24 km

Sol.297.(d) Let the length and speed of train be x m and y m/sec respectively
ATQ,
⇒ x + 140 = 15y
and, x + 180 = 17y ⇒ x + 140 + 40 = 17y
15y + 40 = 17y ⇒ 2y = 40
y = 20 m/sec = 20 × $\frac{18}{5}$ = 72 km/hr
So, the speed of train = 72 km/hr
Alternative method :
Difference in the length of platform
= 180 - 140 = 40 m
Difference in time taken to cross
= 17 - 15 = 2 sec
So, the speed of train
= $\frac{40}{2}$ × ($\frac{18}{5}$) = 72 km/hr

Sol.298.(d) Distance covered by a man
= $\frac{4 \times 5}{5-4} \times \frac{60-24}{60}$ = 20 × $\frac{36}{60}$ = 12 km
Time taken by the man when travels at the speed of 4 km/hr = $\frac{12}{4}$ = 3 hrs
When he travels at the speed of 4 km/hr ,he reaches the station after 3 hrs and is still late by 1 hr. So, he has to reach the station in 2 hrs (3 - 1).
Required speed = $\frac{12}{2}$ = 6 km/hr

Sol.299.(b) Let the speed of two trains be x km/hr and y km/hr
Relative speed of trains,when both are in opposite direction = (x + y) km/hr
ATQ,
150 + 130 = (x + y) × 7.2
280 = (x + y) × 7.2
x + y = $\frac{280}{7.2}$ = $\frac{350}{9}$ m/sec
= $\frac{350}{9} \times \frac{18}{5}$ = 140 km/hr

Sol.300.(a) Required distance
= $\frac{45 \times 40}{45-40} \times \frac{(3+1)}{60} = \frac{1800}{5} \times \frac{4}{60}$
= 24 km

Sol.301.(b) Required distance
= $\frac{10 \times 13}{13-10} \times \frac{(4+5)}{60}$
= $\frac{130}{3} \times \frac{9}{60} = \frac{13}{2}$ = 6.5 km

Sol.302.(c)
Distance covered = 3.5 × 62 = 217 km
New speed = 62 + 8 = 70 km/hr
Time taken to cover the same distance
= $\frac{217}{70} = 3hr\ 6\ min$
Time saved = 3 hr 30 min - 3 hr 6 min
= 24 minutes.

Sol.303.(d) Time taken by Sunil to complete his journey
= 4 : 43 : 45 - 2 : 33 : 34 = 2 : 10 : 11
Starting time for Anil
= 2 : 33 : 34 + 45 : 27 = 3 : 19 : 1
Arriving time for Anil
= 4 : 43 : 45 + 37 : 16 = 5 : 21 : 1
Time taken by Anil to complete his journey = 5 : 21 : 1 - 3 : 19 : 1
= 2:02 or 2 hours 2 minutes.

Sol.304.(c)
Let the speed of the train = x km/hr
$\frac{145+655}{x} = 36$
⇒ $800 = 36x \Rightarrow x = \frac{200}{9}\ m/sec$
The speed of the train = $\frac{200}{9} \times \frac{18}{5}$
$= 80\ km/hr.$

Sol.305.(b) Distance = speed × time
Distance covered by Raj
= $2\frac{1}{3} \times 51 = 119$ km
Time taken by Kiran to complete the same distance at a speed of 68 km/hr
= $\frac{119}{68}$ = $1\frac{3}{4}\ hours.$

Boat and Stream

Important Terms

1). **Still Water Speed**: Speed of a thing in water which is not flowing.

2). **Speed of Current**: The speed at which water is flowing.

3). **Downstream speed**: Speed of a thing, moving in the same direction as that of the current.

Downstream speed = Still water + Speed of current

4). **Upstream Speed**: Speed of a thing, moving in opposite direction as that of the current.

Upstream speed = Still water - Speed of current

Let's take an example:

A man can swim at 20 km/h in still water. He is swimming in a river flowing at 10 km/h.

Here, Speed of current is = 10 km/h

If the man swims downstream i.e. with the flow of the river, his speed = 20 + 10 = 30 km/h

If the man swims upstream i.e. against the flow of the river, his speed = 20 – 10 = 10 km/h

Remember

1). $Still\ water\ speed$

$= \frac{Downstream\ speed + Upstream\ Speed}{2}$

2). Speed of the current $= \frac{Downstream\ speed - Upstream\ Speed}{2}$

Let's verify in the given example:

Still water speed of the man

$= \frac{30+10}{2} = \frac{40}{2} = 20\ km/h$

Speed of the current

$= \frac{30-10}{2} = \frac{20}{2} = 10\ km/h$

Note: Changing km/h to m/s

$\frac{km}{h} = \frac{1000\ m}{3600\ s} = \frac{5}{18} m/s$

$\therefore$ To change km/h to m/s, multiply it by $\frac{5}{18}$.

To change m/s to km/hr, multiply it by $\frac{18}{5}$.

Please note :- (In the following formulas B = speed of boat and S = speed of stream is indicated.)

1.) If the total time taken by the boat to row a distance of D and reach back to its initial position is T then,

(a) Distance between the two places = $\frac{T(B^2-S^2)}{2B}$

(b) Average speed of the boat = $\frac{(B^2-S^2)}{2B}$

2.) If it takes T hours more to go to a point upstream than downstream for the same distance. Then,

Distance = $\frac{T(B^2-S^2)}{2S}$

3.) If a boat travels a distance downstream in T_1 hours and returns the same distance upstream in T_2 hours. Then:- Speed of a man in still water = $\frac{S(T_1+T_2)}{(T_2-T_1)}$

4.) If the time taken by the boat to row same distance in downstream is T_1 and in upstream is T_2. then the ratio of speed of the boat to the speed of stream:-

$$\frac{B}{S} = \frac{\left(T_2+T_1\right)}{\left(T_2-T_1\right)}$$

Variety Questions

Q.1. A boat starting from point P goes downstream to point Q in 3 hours and returns back from point Q to point P in 4 hours. If the speed of the water is 3 km/h, find the speed(km/h) of the boat in still water.
Group D 22/08/2022 (Evening)
(a) 12 (b) 20 (c) 21 (d) 32

Q.2. A boat goes 30 km upstream and 44 km downstream in a total of 10 hours. It also goes 40 km upstream and 55 km downstream in a total of 13 hours. The speed (in km/h) of the stream is:
Group D 26/09/2022 (Afternoon)
(a) 5 (b) 3 (c) 2 (d) 4

Q.3. The time taken by a boat to go 7 km downstream is the same as the time taken by it to go 3 km upstream. It can go 14 km upstream and the same distance downstream in a total time of $6\frac{2}{3}$ hours. How much time (in hours) will it take to go 16.8 km upstream?
NTPC CBT II Level 2 (13/06/2022) Shift 2
(a) 4.2 (b) 3.5 (c) 5.6 (d) 7

Q.4. The speed of a boat in still water is 15 km/h. The speed of the current is 3 km/h. The difference between the time taken for upstream and downstream to complete two trips (i.e from one end to the other coming back and repeating the same again) is 10 minutes. What is the distance between the two ends?
NTPC CBT - I 08/01/2021 (Morning)
(a) 2 km (b) 3.5 km (c) 2.5 km (d) 3 km

Q.5. Speed of a boat in still water is x km/h and the speed of a stream is y km/h. If the time taken to go upstream is 't' hours more than the time taken to go downstream, find the distance covered.
RRB JE 30/05/2019 (Evening)
(a) $[\frac{(x^2-y^2)t}{2xy}]$km (b) $[\frac{(x^2-y^2)t}{2y}]$km
(c) $[\left(\frac{x+y}{x-y}\right)t]$ km (d) $[\frac{(x+y)t}{2}]$ km

Q.6. A boat in a still flowing river travels a certain distance downstream at a speed of 12 km/h and then covers the same distance in the opposite direction at a speed of 24 km/h. Find the average speed for the total journey.
ALP Tier II 23/01/2019 (Morning)
(a) 20 km/h (b) 15 km/h
(c) 18 km/h (d) 16 km/h

Practice Questions

RRC Group D
(17/08/2022 to 11/10/2022)

Q.7. A boat takes 21 minutes to go 12.6 km upstream. The ratio of the speed of the boat in still water to that of the stream is 7:2. How much total time (in hours) will the boat take to go 43.2 km upstream and 38.88 km downstream?
Group D 02/09/2022 (Evening)
(a) 2.4 (b) 2 (c) 1.6 (d) 1.8

Q.8. The speed of a stream is 4 km/h. A boat can go 40 km downstream and 12 km upstream in 4 hours. What is the speed (in km/h) of the boat in still water?
Group D 05/09/2022 (Afternoon)
(a) 16 (b) 12 (c) 10 (d) 14

Q.9. A diver rowing at the speed of 3 km/h in still water takes double the time going 50 km upstream compared to going 50 km downstream. The speed (in km/h) of the stream is:
Group D 16/09/2022 (Morning)
(a) $\frac{7}{3}$ (b) 1 (c) $\frac{4}{3}$ (d) 3

RRB NTPC CBT - 2 (09/05/2022 to 17/06/2022)

Q.10. A person can row at a speed of 11 km/h in still water. The speed of stream is $\frac{5}{6}$ m/s. How much will he take to row a distance of 36 km upstream ?
Level 6 (09/05/2022) Shift 2
(a) 4 hrs 15 min (b) 4 hrs 30 min
(c) 4 hrs 20 min (d) 4 hrs 36 min

Q.11. A boat takes 7 hours to move 63 km downstream and 30 km upstream . The boat takes 6 hours to move 28 km downstream and 48 km upstream. How much time will it take to move 35 km downstream and 27 km upstream?
Level 3 (14/06/2022) Shift 1
(a) 4 hours 45 minutes
(b) 4 hours 50 minutes
(c) 5 hours
(d) 5 hours 20 minutes

Q.12. Manyata rowed a certain distance downstream in 2 hours while it took her 30 minutes More to row the same distance upstream . How much time will she take to make the two-way journey in still water ?
Level 5 (15/06/2022) Shift 1
(a) 4 : 15 : 10 hours (b) 4 : 10 hours
(c) 4 : 26 : 40 hours (d) 4 : 02 : 20 hours

RRB NTPC CBT - 1 (28/12/2020 to 31/07/2021)

Q.13. The speed of a boat in still water is 14 km/h. It goes 28 km downstream in 1 h 45 min. Find the speed of the stream.
RRB NTPC 09/01/2021 (Morning)
(a) 16 km/h (b) 12 km/h
(c) 7 km/h (d) 2 km/h

Q.14. The speed of a stream is 3 km/h and the speed of a man in still water is 5 km/h. The time taken by the man to swim 26 km downstream is:
RRB NTPC 17/01/2021 (Evening)
(a) $4\frac{1}{3}$hours (b) $4\frac{3}{4}$hours
(c) $1\frac{3}{4}$hours (d) $3\frac{1}{4}$hours

Q.15. A steamer goes downstream and covers the distance between two ports in 6 h. It covers the same distance upstream in 8 h. If the speed of the stream is 3 km/h, then the speed of the steamer in still water is:
RRB NTPC 06/04/2021 (Morning)
(a) 10 km/h (b) 21 km/h
(c) 10.375 km/h (d) 21.5 km/h

Q.16. The speed of a boat in still water is 30 km/h and the speed of current is 6 km/h. Find the distances travelled downstream and upstream in 5 minutes each way.
RRB NTPC 26/07/2021 (Evening)
(a) 3 km downstream; 4 km upstream
(b) 3 km downstream; 3 km upstream
(c) 2 km downstream; 2 km upstream
(d) 3 km downstream; 2 km upstream

RRB JE (22/05/2019 to 28/06/2019)

Q.17. Speed of a man in still water is (28/3) km/h. It takes him thrice as much time to row upstream as it takes to row downstream. What is the velocity of the stream?
RRB JE 23/05/2019 (Evening)
(a) (16/3) km/h (b) (14/3) km/h
(c) (20/3) km/h (d) 6 km/h

Q.18. A boat whose speed in still water is 15 km/h goes 30 km downstream and comes back upstream in 4.5 hours. What is the speed of water current?
RRB JE 01/06/2019 (Morning)
(a) 10 km/h (b) 4 km/h
(c) 5 km/h (d) 6 km/h

Q.19. If the speed of boat in still water is x km/h and speed of stream is y km/h and time taken to row to a spot and return is 't' hours, then find the distance covered either way.
RRB JE 26/06/2019 (Morning)
(a) [$(\frac{x^2+y^2}{2xy}$)t]km (b) [$\frac{t(x^2-y^2)}{2xy}$] km
(c) [$\frac{2t(x^2-y^2)}{xy}$]km (d) [$\frac{t(x^2-y^2)}{xy}$]km

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.20. To go a distance of 40 km upstream a rower takes 8 hours while it takes her only 5 hours to row the same distance downstream. What was the rower's speed in still water ?
RRB ALP 13/08/2018 (Evening)
(a) 4.5 km/h (b) 4 km/h
(c) 6.5 km/h (d) 1.5 km/h

Answer key:-

1.(c)	2.(b)	3.(c)	4.(d)
5.(b)	6.(d)	7.(d)	8.(b)
9.(b)	10.(b)	11.(a)	12.(c)
13.(d)	14.(d)	15.(b)	16.(d)
17.(b)	18.(c)	19.(b)	20.(c)

Solutions:-

Sol.1.(c) Let the speed of boat in still water be x km/h
Downstream speed = (x + 3) km/h
Upstream speed = (x - 3) km/h
Now, 3 (x + 3) = 4 (x - 3)
$\Rightarrow 3x + 9 = 4x - 12 \Rightarrow 4x - 3x = 9 + 12$
$\Rightarrow x = 21$
Speed of boat = 21 km/h

Sol.2.(b) Let the speed of stream = y km/h and speed of boat = x km/h
$\frac{44}{x+y} + \frac{30}{x-y} = 10$..... (1)
$\frac{55}{x+y} + \frac{40}{x-y} = 13$..... (2)
By solving eq .(1) and (2) we get,
x + y = 11....(3) and x - y = 5.....(4)
By solving eq .(3) and (4) we get,
x = 8 and y = 3
Hence, the speed of the stream (y) is 3 km/h.

Sol.3.(c) As per question,
$\frac{7}{x+y} = \frac{3}{x-y}$
So, $\frac{x-y}{x+y} = \frac{3}{7}$
Speed in upstream = 3 km/h
Required time to cover 16.8 km upstream
= $\frac{16.8}{3}$ = 5.6 hour

Sol.4.(d) Downstream speed
= 15 + 3 = 18 km/h
Upstream speed = 15 - 3 = 12 km/h
Distance travelled in both cases are equal, $D_d = D_u$
$\Rightarrow 18 \times T_d = 12 \times T_u \Rightarrow \frac{T_d}{T_u} = \frac{12}{18} = \frac{2}{3}$
Difference of time in ratio = 1, which is equal to 5 minutes (per round)
$\Rightarrow$ Time (upstream) = 3(in ratio)
= 3 × 5 = 15 minutes = 0.25 hour
Distance = 12 × 0.25 = 3 km

Sol.5.(b)
Speed of a boat in still water = x km/h
Speed of a stream = y km/h
Speed of a boat in upstream
=$(x - y)$ km/h
Speed of a boat in downstream
= $(x + y)$ km/h
According to question ,
$\frac{D}{(x-y)} - \frac{D}{(x+y)}$ = t
$\frac{(x+y)-(x-y)}{x^2-y^2} = \frac{t}{D}$
D = [$\frac{(x^2-y^2)t}{2y}$] km

Sol.6.(d) Average speed = $\frac{2\times S1\times S2}{S1+S2}$

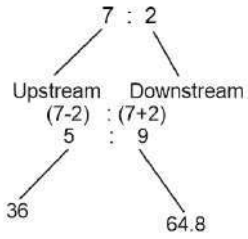
$\frac{2\times12\times24}{12+24}$ = $\frac{2\times12\times24}{36}$ = 16

Hence, the average speed for the journey = 16 km/h

Sol.7.(d) Speed of the boat in upstream

= $\frac{12.6}{21}\times 60 = 36\ km/h$

Ratio of speed of the boat in still water to speed of stream = 7 : 2



Upstream speed = 5 units = 36

Downstream speed = 9 units

= $\frac{36}{5}$ x 9 = 64.8

Now, total time taken by boat

= $\frac{43.2}{36}+\frac{38.88}{64.8} = 1.2 + 0.6$

$= 1.8\ hours$

Sol.8.(b) Let the speed of the boat in still water be x km/h.

$\frac{40}{x+4}+\frac{12}{x-4}=4$

$\Rightarrow\frac{40x-160+12x+48}{x^2-16}=4$

$\Rightarrow 4x^2-64=52x-112$

$\Rightarrow 4x^2-52x+48=0$

$\Rightarrow x^2-13x+12=0$

$\Rightarrow x^2-12x-x+12=0$

$\Rightarrow (x-12)(x-1)=0 \Rightarrow x=12\ or\ 1$

Hence, the speed of the boat = 12 km/h

Sol.9(b) According to the question,

	Upstream		Downstream
Speed →	1	:	2

Speed of the boat = $\frac{1+2}{2}=\frac{3}{2}\ unit$

Speed of stream = $\frac{2-1}{2}=\frac{1}{2}\ unit$

$\frac{3}{2}\ unit\ corresponds\ to\ 3\ km/h$

Then, 1 unit corresponds to $2\ km/h$

Hence, the speed of the stream

= $\frac{1}{2}\times 2 = 1\ km/h$

Sol.10.(b) $\frac{5}{6}$ m/s = 3 km/h

speed in up stream = 11 km /h - 3 km/h = 8 km/h

Time = distance / speed = $\frac{36}{8}$ hr

= 4 hrs 30 min

Sol.11.(a) Let the speed of boat = x km/h

Speed of current = y km/h

$\frac{63}{x+y}+\frac{30}{x-y}$ = 7.....× 8

$\frac{28}{x+y}+\frac{48}{x-y}$ = 6.....× 5

$\frac{504}{x+y}-\frac{140}{x+y}$ = 26 ⇒ $\frac{364}{x+y}$ = 26

On solving,

x + y = 14

x - y = 12

x = 13 and y = 1

As per question,

$\frac{35}{13+1}+\frac{27}{13-1}=\frac{5}{2}+\frac{9}{4}$

= $\frac{19}{4}$ hours or 4 hours 45 min

Sol.12.(c)

Let the speed of water = x km/h

Speed of current = y km/h

	Upstream	:	Downstream
Time	2.5 hr	:	2hr
Speed	2	:	2.5

So distance = 2.5 × 2 = 5

x + y = 2.5

x - y = 2

so x = 2.25

So time taken by Mayanta to make the two-way journey in still water

= $\frac{2\times5}{2.25}$ = $\frac{40}{9}$ = $4\frac{4}{9}$ = 4 : 26 : 40 hrs

Sol.13.(d)

Let the speed of the stream = y km/h

According to the question,

⇒ $\frac{28}{14+y}=1+\frac{45}{60}=\frac{7}{4}$

$\Rightarrow y = 2$ km/h

Sol.14.(d) Downstream speed

= 5 + 3 = 8 km/h

Time = $\frac{26}{8}=\frac{13}{4}\Rightarrow 3\frac{1}{4}hours$

Sol.15.(b) Let the speed of the steamer in still water is x km/h. And the distance between two points is D ;

Then D = 6×(x + 3)

also D = 8×(x - 3)

$\Rightarrow 6\times(x+3)=8\times(x-3)$

$\Rightarrow x=21$

Then the speed of the steamer in still water is 21 km/h.

Sol.16.(d)

Let the speed of boat = 30 km/h

Speed of current = 6 km/h

Downstream speed of boat

= 30 + 6 = 36 km/h

Upstream speed of boat

= 30 - 6 =24 km/h

Distance travelled in 5 min

Upstream = $\frac{24}{60}\times 5 = 2\ km$

Downstream = $\frac{36}{60}$

Sol.17.(b)

Let the velocity of the stream = x km/hr

Ratio →	Upstream	:	Downstream
Time →	3	:	1
Speed →	1	:	3

A/Q, $\frac{\frac{28}{3}-x}{\frac{28}{3}+x}=\frac{1}{3}$

$\Rightarrow \frac{28-3x}{28+3x}=\frac{1}{3}$

$\Rightarrow 84-9x=28+3x$

$\Rightarrow 12x=84-28$

$\Rightarrow 12x=56 \Rightarrow x=\frac{14}{3}\ km/h$

Sol.18.(c)

Speed of boat in still water = 15 km/h

Speed of water in current = x km/h

Speed of boat in upstream = $(15-x)$ km/h

Speed of boat in downstream

= $(15+x)$km/h

A.T.Q, $\frac{30}{(15-x)}+\frac{30}{(15+x)}$ = 4.5

$\frac{(15+x)+(15-x)}{(15-x)(15+x)}=\frac{4.5}{30}$

→ $(15-x)(15+x)$ = 200

= $225-15x+15x-x^2$ = 200

x^2 = 25 → x = $\sqrt{25}$ = 5 km/h

Sol.19.(b)t=$\frac{D}{x+y}+\frac{D}{x-y}$

⇒ $\frac{D[(x-y)+(x+y)]}{(x+y)(x-y)}$ = t

D =[$\frac{t(x^2-y^2)}{2x}$] km

Sol.20.(c)

Upstream speed = $\frac{40}{8}$ = 5 km/hr

Downstream speed = $\frac{40}{5}$ = 8 km/hr

Speed of rower in still water = $\frac{5+8}{2}$

= 6.5 km/hr

Percentage

Key Points:

What does a percentage mean ?, let 20%

20% simply means $\frac{20}{100}$ of something.

Also, you can see $\frac{20}{100} = \frac{1}{5}$

$= 0.2$ i.e. 0.2 of something is the same as 20% of that thing.

- Percentage change $= \frac{New\ value - Original\ value}{Original\ value} \times 100$
- Percentage point change means difference between two percentage rates. For instance, 50% - 30% = 20%, so here the percentage point change is 20.
- If the price of a product increases by a%, then to keep expenditure same, percentage reduction in consumption required = $(\frac{a}{100+a} \times 100)$%
- If the price of a product decreases by a%, then to keep expenditure same, percentage increase in consumption required = $(\frac{a}{100-a} \times 100)$%
- If A is R% more than B, then B is less than A by = $(\frac{R}{100+R} \times 100)$%
- If A is R% less than B, then B is more than A by = $(\frac{R}{100-R} \times 100)$%
- If the number is first increased by x% and then decreased by x%, then the net result is always decrease and it is equal to = $(\frac{x^2}{100})$%. Same result will be obtained in the vice-versa case.

Successive percentage change :

1. Two successive percentage change : If the number is first increased by a% and then increased by b% then,

   Effective percentage change = $(a + b + \frac{ab}{100})$%

   Similarly, if the number is first increased by a% and then decreased by b%, then

   Effective percentage change = $(a - b - \frac{ab}{100})$%

2. Three successive percentage change : If the number is first increased by a% then by b% and then by c%, then

   Effective percentage change = $(a + b + c + \frac{ab+bc+ca}{100} + \frac{abc}{10000})$%

Important Fractions and their equivalent Percentage

1) $\frac{1}{2} = 50\%$ **2)** $\frac{1}{3} = 33\frac{1}{3}\% = 33.33\%$

3) $\frac{1}{4} = 25\%$ **4)** $\frac{1}{5} = 20\%$

5) $\frac{1}{6} = 16.67\%$ **6)** $\frac{1}{7} = 14\frac{2}{7}\% = 14.28\%$

7) $\frac{1}{8} = 12.5\%$ **8)** $\frac{1}{9} = 11\frac{1}{9}\% = 11.11\%$

9) $\frac{1}{10} = 10\%$ **10)** $\frac{1}{11} = 9\frac{1}{11}\% = 9.09\%$

11) $\frac{1}{12} = 8\frac{1}{3}\%$ **12)** $\frac{1}{13} = 7.69\%$

13) $\frac{1}{14} = 7.14\%$ **14)** $\frac{1}{15} = 6.67\%$

15) $\frac{1}{16} = 6.25\%$ **16)** $\frac{5}{6} = 83\frac{1}{3}\%$

17) $\frac{3}{8} = 37.5\%$ **18)** $\frac{5}{8} = 62.5\%$

19) $\frac{7}{8} = 87.5\%$ **20)** $\frac{3}{11} = 27.27\%$

21) $\frac{2}{3} = 66\frac{2}{3}\% = \frac{200}{3}\%$

22) $\frac{7}{3} = 2\frac{1}{3} = 233\frac{1}{3}\%$

23) $\frac{9}{8} = 1\frac{1}{8} = 112.5\%$

24) $\frac{2}{7} = 28.56\%$

These fractions are very common and it will be very helpful to learn them.

Variety Questions

Q.1. A student scored 80/80 marks in term 1 and 75/90 marks in term 2. What will be his percentage of final score, if the weightage given to the terms is 40% and 60%, respectively. (correct to the nearest integer)
Group D 22/08/2022 (Morning)
(a) 90% (b) 95% (c) 70% (d) 85%

Q.2. Ramu used to spend 72% of his income. His income has increased by 12% and he has increased his expenditure by 5%. If Ramu earlier saved ₹y and after the increase he now saves ₹x, then what is the value of $(\frac{x-y}{y} \times 100)$ %?
Group D 30/08/2022 (Morning)
(a) 22% (b) 27% (c) 25% (d) 30%

Q.3. The annual income of Ram is ₹ 5,62,400. He spent 20% of this income on house rent, 15% of the remaining income on food, and 30% of the income still remaining with him on children's education. If the amount still remaining was his savings, which of the following amounts is closest to his actual savings?
Group D 02/09/2022 (Evening)
(a) ₹ 2,67,037 (b) ₹ 2,76,703
(c) ₹ 2,67,703 (d) ₹ 2,67,730

Q.4. Sujata buys 9 apples and 8 mangoes for ₹276. When the cost of an apple is decreased by 10% and that of a mango remains the same, then the cost of 5 apples and 10 mangoes is ₹210. What is the original cost of 4 apples and 3 mangoes ?
Group D 05/09/2022 (Evening)
(a) 116 (b) 123 (c) 120 (d) 108

Q.5. Last year, Ganga's monthly salary was ₹12,000, and Saraswati's monthly salary was ₹10,000. This year, Ganga's monthly salary is ₹14,400, while Saraswati's monthly salary is ₹12,500. If the percentage increase in monthly salary of Saraswati this year as compared to last year's monthly salary is denoted by x%, and the percentage increase in monthly salary of Ganga this year as compared to last year's monthly salary is denoted by y %, then find the value of $(\frac{x-y}{y} \times 100)$ %.
Group D 06/09/2022 (Evening)
(a) 25% (b) 24% (c) 20% (d) 22%

Q.6. The cost of a washing machine is 40% less than the cost of a TV. If the cost of the washing machine increases by 18% and that of the TV decreases by 10%, then what is the change in the total cost of 5 washing machines and 2 TVs ?
Group D 09/09/2022 (Afternoon)
(a) Decreases by 6.5%
(b) Decreases by 6.4%
(c) Increases by 6.5%
(d) Increases by 6.8%

Q.7. Mridul's working hours per day increased by 25% and his hourly wages increased by 20%. By how much percent did his daily earnings increase ?
Group D 20/09/2022 (Afternoon)
(a) 30% (b) 46% (c) 50% (d) 40%

Q.8. Due to decrease in manpower, the production in a factory decreases by 30%. By what percent should the working hours be increased to restore the original production ?
Group D 22/09/2022 (Afternoon)

(a) 42% (b) $42\frac{6}{7}$% (c) 43% (d) 41%

Q.9. X sells a washing machine to Y at a profit of 20%. Y sells it to Z at a loss of 12% and later Z sells it to T at a profit of 30%. If Z earns ₹87.60 more than X as profit, then at what price (in₹) did Y buy the washing machine ?
Group D 26/09/2022 (Morning)
(a) 960 (b) 1,020 (c) 900 (d) 980

Q.10. In a Lions Club, 70% of the members are young and 30% of the members are old. The average age of the old members is 40 years and that of the young members is 20 years. What is the average age of all the members (in years) ?
Group D 30/09/2022 (Evening)
(a) 26 (b) 22 (c) 28 (d) 24

Q.11. The sum of two numbers is 205. If one of these numbers is reduced by 5% and the other is increased by 10%, the resulting numbers are equal to each other. Find the smaller of the two initial numbers.
Group D 06/10/2022 (Morning)
(a) 95 (b) 100 (c) 105 (d) 110

Q.12. If the length l of a room is reduced by 10% and breadth b is increased by 10%, then find the positive change in its perimeter.
Group D 11/10/2022 (Evening)
(a) $\frac{l-b}{5}$ (b) $\frac{2}{5}(l+b)$
(c) $\frac{2}{5}(l-b)$ (d) $\frac{l+b}{5}$

Q.13. Ravi has to go from Hyderabad to Delhi. The distance between Hyderabad and Delhi is 1,200 kms. He decides to travel 25% of the distance on foot , 30% of the distance by bus,and 15% of the distance by train and remaining distance by an airplane. What is the distance travelled by Ravi by an Airplane?
NTPC CBT II Level 5 (12/06/2022) Shift 1
(a) 300 km (b) 360 km
(c) 580 km (d) 425 km

Q.14. A and B are numbers such that A is 40% larger than B. If A is decreased by 20% and B is increased by 38% then what is the percentage increase in the total value of A and B ?
NTPC CBT II Level 2 (13/06/2022) Shift 1
(a) 5 % (b) $4\frac{1}{6}$ % (c) $8\frac{1}{3}$% (d) 10 %

Q.15. The marks obtained by A in a test are 20% more than the marks obtained by B and C obtained 85% of the total marks obtained by A and B. By what percentage are the marks obtained by A less than the marks obtained by C ? (Correct to one decimal place)
NTPC CBT II Level 3 (14/06/2022) Shift 2
(a) 35.8% (b) 34.6% (c) 55.8% (d) 37.2%

Q.16. Total number of students in class X is 140 and the ratio of boys to girls is 2 : 3. If 50% of the boys and 33.33% of the girls are selected for competition in school . Then find the Percentage of unselected boys to unselected girls ?
NTPC CBT II Level 5 (15/06/2022) Shift 3
(a) 50% (b) 28% (c) 56% (d) 66.66%

Q.17. In measuring the sides of a rectangle error of 10% and 8% in excess are made. Find the error percent in its area.
NTPC CBT II Level 2 (16/06/2022) Shift 2
(a) 1.88% (b) 188% (c) 18.8% (d) 0.188%

Q.18. What is to be added to 12% of 2400, so that the sum will be equal to 18% of 5400 ?
NTPC CBT - I 28/12/2020 (Morning)
(a) 952 (b) 972 (c) 684 (d) 288

Q.19. In an examination, 55% candidates passed in English, 35% candidates passed in mathematics and 20% candidates passed in both the subjects. If the total number of failed candidates in both the subjects is 1200, then find how many candidates took the exam.
NTPC CBT - I 29/12/2020 (Morning)
(a) 2800 (b) 1200 (c) 4000 (d) 3000

Q.20. In an examination, 41% of students failed in Economics, 35% of students failed in Geography and 39% of students failed in History, 5% of the students failed in all the three subjects, 14% of students failed in Economics and Geography. 21% of the students failed in Geography and History and 18% of students failed in History and Economics. Find the percentage of students who failed in only Economics.
NTPC CBT - I 08/01/2021 (Morning)
(a) 10% (b) 14% (c) 16% (d) 12%

Q.21. Ananya and Babita have respectively 20% and 28% less money than their friend Kavita. By What percentage has Babita less money than Ananya?
NTPC CBT - I 10/01/2021 (Morning)
(a) 48 (b) 10 (c) 20 (d) 90

Q.22. If a student multiplied a number by $\frac{3}{4}$ instead of $\frac{4}{3}$, then find the percentage of error in the calculation (approximately).
NTPC CBT - I 11/01/2021 (Morning)
(a) 53% (b) 44% (c) 73% (d) 48%

Q.23. District XYZ has 50,000 voters, out of them, 20% are urban voters and 80 % rural voters. For an election, 25 % of the rural voters were shifted to the urban area. Out of the voters in both rural and urban areas, 60% are honest,70% are hardworking and 35% are both honest and hardworking. Two candidates, A and B , contested the election. Candidate B swept the urban vote, While Candidate A found favour with the rural voters. Voters who were both honest and hardworking voted for NOTA. How many votes were polled in favour of candidates A. candidate B and NOTA respectively ?
NTPC CBT - I 16/01/2021 (Morning)
(a) 19,500, 13000 & 17500
(b) 17000, 15500 & 17500
(c) 19000, 13500 & 17500
(d) 17875, 14625 & 17500

Q.24. If the numerator of a fraction is increased by 30% and its denominator is decreased by 35%, the value of the fraction becomes $\frac{3}{15}$. Find the original fraction.
NTPC CBT - I 01/02/2021 (Morning)
(a) $\frac{3}{10}$ (b) $\frac{1}{5}$ (c) $\frac{3}{5}$ (d) $\frac{1}{10}$

Q.25. A man got a discount of 10% on Sugar at Big Mart which allowed him to buy 25 kg more for rupees 225/-. What is the discounted price and the original price of the sugar per kg ?
NTPC CBT - I 03/02/2021 (Evening)
(a) 50p, Rs. 2 (b) 70p, Rs. 2
(c) 80p, Rs. 3 (d) 90p, Rs. 1

Q.26. The lengths of 2 adjacent sides of a square are increased by 35% and 25%. The area of the resulting rectangle exceeds the area of the square by:
NTPC CBT - I 04/02/2021 (Morning)
(a) 69.75% (b) 70.75%
(c) 67.75% (d) 68.75%

Q.27. The electricity bill of a certain establishment is partly fixed and partly variable depending on the number of units of electricity consumed. In a certain month when 540 units were consumed, the bill was Rs. 1800. In another month when 620 units were consumed, the bill was Rs. 2040, if in a month 500 units are consumed, then the bill for that month will be .
NTPC CBT - I 11/02/2021 (Morning)
(a) 1840 (b) 1950 (c) 1680 (d) 1560

Q.28. If x% of y is 2000 and y% of z is 4000, the relation between x and z will be:
RRB NTPC 12/02/2021 (Morning)
(a) 2z = 7x (b) 6z - 2 = 2x
(c) 6z = $\frac{x}{2}$ (d) z = 2x

Q.29. If the price of oil is increased by 45% , then by what percentage should a family reduce its consumption so that the expenditure remains the same?
NTPC CBT - I 19/03/2021 (Evening)
(a) $31\frac{2}{29}$ (b) $3\frac{1}{29}$ (c) $31\frac{1}{29}$ (d) $1\frac{1}{29}$

Q.30. In an examination, it is required to get 33% of the maximum marks to pass. A student got 130 marks and was declared failed by 35 marks. The maximum marks for the exam is _____.
NTPC CBT - I 01/04/2021 (Evening)
(a) 300 (b) 600 (c) 550 (d) 500

Q.31. The price of a car is Rs. 6,25,000. It was insured to 80% of its price. The car was damaged completely, and the insurance company paid 90% of the insurance. What was the difference between the price of the car and the amount received ?
NTPC CBT - I 03/04/2021 (Morning)
(a) 18,000 (b) 1,50,000
(c) 1,25,000 (d) 1,75,000

Q.32. The value of a desktop computer depreciates at the rate of 20% every year. It was purchased 3 years ago. If its present value is Rs.12288. What was its purchase price 3 years ago ?
NTPC CBT - I 23/07/2021 (Morning)
(a) 24,000 (b) 24,750
(c) 23,750 (d) 24,250

Q.33. A precious crystal piece worth Rs.15600 is accidentally dropped and was broken into three pieces, their weights respectively proportional to 2, 3 and 5 units. Value of the crystal varies directly as the cube of its weight. Calculate the percentage loss in the value. ?
RRB JE 30/05/2019 (Afternoon)
(a) 84% (b) 16% (c) 75% (d) 25%

Q.34. If $\frac{(0.29 + 0.25 + 0.01)}{0.005}$ = a% , then find the value of 'a'.
RRB JE 26/06/2019 (Evening)
(a) 5000 (b) 500 (c) 11000 (d) 110

Q.35. If the length of a rectangle is increased by 80% and the breadth by 20%, what will be the increase in its area?
ALP Tier II 08/02/2019 (Morning)
(a) 60% (b) 116% (c) 120% (d) 156%

Q.36. 25% of the 66.67% of 75% of the 80% of a number is 4617. So what would be 40% of that number ?
RPF Constable 17/01/2019 (Morning)
(a) 18468 (b) 18668 (c) 18568 (d) 18768

Q.37. Jeffrey donates 13% of his salary to disabled organizations, 12% to orphanages, 14% to physically handicapped organizations and 16% to medical aid organizations. The remaining amount of 23445 is deposited in the bank for the monthly expenditure. Tell the amount donated in the orphanage.
RPF S.I. 06/01/2019 (Morning)
(a) 6652 (b) 6252 (c) 6452 (d) 6852

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.38. Last year, Ranjan's monthly salary was ₹ 34,500 and this year his monthly salary is ₹ 38,640 . What is the percentage increase in Ranjan's monthly salary in this year over his monthly salary last year?
Group D 17/08/2022 (Afternoon)
(a) 12% (b) 13% (c) 15% (d) 20%

Q.39. The population of a town is 2,24,375. If it increases at the rate of 4% per annum, what will be its population 2 years hence?
Group D 22/08/2022 (Morning)
(a) 2,42,684 (b) 2,40,468
(c) 2,36,864 (d) 2,32,846

Q.40. Rajeev's salary was first decreased by 40%, and then increased by 50%. By what percent is the new salary less than his initial salary?
Group D 23/08/2022 (Evening)
(a) 10% (b) 14% (c) 12% (d) 15%

Q.41. 1500 people visited an exhibition on Saturday, while 1680 visited on Sunday. The percentage increase in the number of people visiting the exhibition is ____.
Group D 24/08/2022 (Morning)
(a) 18% (b) 13% (c) 12% (d) 10%

Q.42. Mohan gets 12% increase in his sale amount in the first year and 15% increase in the second year, with that his present sale is ₹1,28,800, what was his sale two years ago ?
Group D 25/08/2022 (Morning)
(a) ₹1,75,000 (b) ₹1,00,000
(c) ₹1,50,000 (d) ₹1,25,000

Q.43. X spends 16% of his income each month on travel, 40% on groceries, and 14% on family medical expenses. He is left with a balance of ₹ 9,630. Find his annual income.
Group D 26/08/2022 (Afternoon)
(a) ₹3,85,200 (b) ₹23,767
(c) ₹2,85,200 (d) ₹32,100

Q.44. A's salary is 20% less than B's. B's salary is what percent more than A's salary ?
Group D 26/08/2022 (Evening)
(a) 15% (b) 25% (c) 17% (d) 20%

Q.45. The population of the village was 4,00,000. It increased by 20% in the first year and increased by 30% in the second year. Its population after these two years is :
Group D 29/08/2022 (Morning)
(a) 5,40,000 (b) 6,24,000
(c) 5,20,000 (d) 6,25,000

Q.46. In an election between two candidates, the winner received 1854 votes and the loser received 618 votes. What percentage of the total number of votes received by the candidates went in favour of the winning candidate?
Group D 29/08/2022 (Afternoon)
(a) 70 (b) 60 (c) 80 (d) 75

Q.47. If 18% of 200 = x , then x = ?
Group D 01/09/2022 (Morning)
(a) 36 (b) 27 (c) 63 (d) 72

Q.48. If the numerator of a fraction be increased by 10% and its denominator be reduced by 5% , then the fraction becomes$\frac{4}{5}$. Find the original fraction.
Group D 05/09/2022 (Morning)
(a) $\frac{23}{55}$ (b) $\frac{38}{55}$ (c) $\frac{17}{25}$ (d) $\frac{19}{25}$

Q.49. The current population of a town is 15,625. It increases by 8% and 12% in two successive years but decreases by 22% in the third year. What is the population of the town at the end of the third year?
Group D 05/09/2022 (Morning)
(a) 14,042 (b) 15,120
(c) 13,230 (d) 14,742

Q.50. The price (per litre) of petrol increases by 52%. By what percent should its consumption be reduced such that the expenditure on it increases by 14% only?
Group D 05/09/2022 (Afternoon)
(a) 30% (b) 38% (c) 25% (d) 35%

Q.51. The income of Raman is ₹45,000.

He saves 12.5% of his income. If his income increases by 18% and expenditure increases by 20%, then his savings will:
Group D 05/09/2022 (Evening)
(a) decrease by ₹215
(b) increase by ₹225
(c) increase by ₹250
(d) decrease by ₹220

Q.52. If income increases by ₹ 500, what will be the increase in consumption (Assume MPC = 0.5)?
Group D 06/09/2022 (Morning)
(a) ₹250 (b) ₹750 (c) ₹50 (d) Rs.500

Q.53. A number when increased by $47\frac{1}{2}$ %, gives 590. The number is:
Group D 09/09/2022 (Evening)
(a) 700 (b) 500 (c) 600 (d) 400

Q.54. 40% of 60% of $\frac{5}{8}$ of a number is 339. The number is:
Group D 12/09/2022 (Morning)
(a) 2260 (b) 4260 (c) 5260 (d) 3260

Q.55. The price of fuel decreases by 15%, 12% and 10% in three successive months, but increase by 25% in the fourth month. What is the percentage increase/decrease in the price of fuel in the fourth month as compared to its original price ?
Group D 12/09/2022 (Evening)
(a) Increases by 15.75%
(b) Decreases by 15.85%
(c) Decreases by 12%
(d) Increases by 10%

Q.56. When the price of a magazine was reduced by 30%, its sale increased by 70%. The net revenue:
Group D 14/09/2022 (Morning)
(a) decreased by 20%
(b) increased by 17%
(c) decreased by 19%
(d) increased by 19%

Q.57. During the first year, the population of a town increased by 10% and in the second year it diminished by 10%. At the end of the second year its population was 4,73,220. The population of the first year was :
Group D 15/09/2022 (Morning)
(a) 4,78,880 (b) 4,78,780
(c) 4,78,000 (d) 4,78,800

Q.58. if 35% of × = 40% of y, then X : Y is _____.
Group D 16/09/2022 (Afternoon)
(a) 8 : 7 (b) 8 : 9 (c) 9 : 8 (d) 7 : 8

Q.59. Ravi's salary was first reduced by 50% and subsequently raised by 50%. How much lower was his final salary compared to his initial salary ?
Group D 16/09/2022 (Afternoon)
(a) 25% (b) 21% (c) 32% (d) 24%

Q.60. Aman makes a monthly payment equal to 15% of his monthly salary towards debt repayment. He spends 75% of the remaining salary and saves ₹425. His monthly salary is:
Group D 17/09/2022 (Evening)
(a) ₹1800 (b) ₹2400
(c) ₹2200 (d) ₹2000

Q.61. The present cost of a building is ₹1,28,000. After a year , its cost increased to ₹1,46,000. The percentage increase (rounded off to the nearest integer) in the cost of the building is:
Group D 18/09/2022 (Morning)
(a) 13 (b) 12 (c) 15 (d) 14

Q.62. Out of his total monthly salary, Mohan spends 20% on house rent and 50% of the rest is his total household expenditure. If he saves ₹10,600, then his total monthly salary is:
Group D 18/09/2022 (Evening)
(a) ₹24,500 (b) ₹25,000
(c) ₹27,000 (d) ₹26,500

Q.63. The price of a laptop in a shop is decreased by 35%, as a result of which the sales increased by 20%. What is the effect on the total revenue of the shop from the sale of laptops ?
Group D 19/09/2022 (Morning)
(a) 10% increase (b) 22% decrease
(c) 10% decrease (d) 18% increase

Q.64. When the price of an article is increased by 20% its sale reduces by 20%. What is the net effect on the revenue ?
Group D 20/09/2022 (Evening)
(a) 4% decrease (b) 4% increase
(c) 20% decrease (d) 20% increase

Q.65. Ravi spends 20% of his income on petrol, one-third of the remaining income on household expenditure, and the balance is his savings. If he spends ₹7,500 on petrol, find his household expenditure.
Group D 26/09/2022 (Morning)
(a) ₹8,566.70 (b) ₹8,500
(c) ₹8,666.70 (d) ₹10,000

Q.66. The population of a city increased by 10% in 2020 and then decreased by 8% in 2021. Find the percentage change in the population of the city at the end of 2021 with respect to its population at the beginning of 2020.
Group D 28/09/2022 (Morning)
(a) 0.9% increase (b) 1.2% increase
(c) 0.9% decrease (d) 1.2% decrease

Q.67. The price of a bike was increased by 10% and then again increased by 8%. The net percentage increase in the price of the bike is :
Group D 28/09/2022 (Afternoon)
(a) 18% (b) 19% (c) 18.8% (d) 17%

Q.68. 5650 increased by 15% equals how much ?
Group D 29/09/2022 (Morning)
(a) 6795.50 (b) 6997.25
(c) 6435.00 (d) 6497.50

Q.69. The marks of a student increased from 10 to 12. Find the percentage increase in the marks.
Group D 29/09/2022 (Afternoon)
(a) 12% (b) 17% (c) 2% (d) 20%

Q.70. 20% of the population of a city died due to war, and of the remaining population, 5% died in an epidemic. If the present population of the city is 15,200, then find the population of the city before the war.
Group D 30/09/2022 (Morning)
(a) 20,000 (b) 20,100
(c) 23,500 (d) 19,680

Q.71. A man's monthly income is ₹50,000. He spends 25% of it on tax, 30% of the remaining income on household expenses, and 10% of the still remaining income on entertainment. He saves the remaining part of his income. How much money will the man save per year, assuming that the above data is same for all 12 months?
Group D 30/09/2022 (Evening)
(a) ₹2,83,050 (b) ₹2,38,500
(c) ₹2,83,500 (d) ₹2,85,300

RRB NTPC CBT - 2 (09/05/2022 to 17/06/2022)

Q.72. If 23.5% of a number is 11.75, then what is the number ?
Level 6 (09/05/2022) Shift 1
(a) 50 (b) 60 (c) 40 (d) 48

Q.73. Shubham secured 345 marks out of 600 in the annual examination. Find the percentage of marks obtained by him in the examination.
Level 4 (10/05/2022) Shift 1
(a) 57.5 (b) 57.25 (c) 58.5 (d) 58.25

Q.74. Vimal secured 46% marks in the exam and failed to qualify in the exam by

10 marks. If he secured 52% marks, he would have secured 8 marks more than what was the minimum qualifying marks. What were the minimum qualifying marks. What were the minimum marks one had to score to qualify in the exam ?
Level 5 (12/06/2022) Shift 2
(a) 156 (b) 146 (c) 148 (d) 138

Q.75. 12.5% of the first number is 37.5% of the second number. If the second number is subtracted from the first number, we get an answer of 1428. Find the sum of the two numbers.
Level 2 (13/06/2022) Shift 2
(a) 2846 (b) 2856 (c) 2716 (d) 2936

Q.76. A family's monthly income is ₹45,000. Out of the monthly income 20% is spent on food, 20% is spent on the house rent, 5% is spent on shopping, 10% is spent on personal expenses and the rest is saved. If they decided to donate 12% of the monthly savings to the poor, what is the amount that they donate to the poor ?
Level 3 (14/06/2022) Shift 2
(a) ₹2750 (b) ₹3230 (c) ₹3500 (d) ₹2430

Q.77. A survey of the game was conducted . A total of 360 people participated in that survey . Only 54 people liked soccer. What percentage of the people surveyed liked soccer ?
Level 5 (15/06/2022) Shift 1
(a) 10% (b) 12.5% (c) 20% (d) 15%

Q.78. If 15% of A : 25% of B :: 8 : 11, then A : B is equal to:
Level 5 (15/06/2022) Shift 1
(a) 4 : 3 (b) 33 : 32 (c) 5 : 4 (d) 40 : 33

Q.79. A reduction of 20% in the price of wheat enables a housewife to obtain 4 kgs more for ₹1200, what is the reduced price per kg(in₹) ?
Level 5 (15/06/2022) Shift 2
(a) 40 (b) 60 (c) 75 (d) 50

Q.80. The product of 15% of A and 35% of B, when divided by 21% of C gives 37 as the answer. What will be the answer if the product of A and B is divided by C ?
Level 5 (15/06/2022) Shift 2
(a) 111 (b) 185 (c) 148 (d) 74

Q.81. Number A is eight times as large as number B. By what percentage is number B less than number A ?
Level 5 (15/06/2022) Shift 2
(a) 87.5% (b) 20% (c) 80% (d) 12.5%

Q.82. In an election, 90% of those entitled to vote cast their ballot, 80% of the vote cast was valid. The winner got 60% of the valid votes. If the winner got 64800 votes, what was the number of people entitled to vote ?
Level 5 (15/06/2022) Shift 3
(a) 175000 (b) 125000
(c) 150000 (d) 200000

Q.83. The L.C.M. two numbers is 252 and their H.C.F. is 14. If one of the numbers is 28, then by what percentage is the other number more than 28 ?
Level 2 (16/06/2022) Shift 1
(a) 340% (b) 310% (c) 330% (d) 350%

Q.84. In an examination Sunita scored 90% of what Anita scored, while Anita's score was 110% of what Vinita scored. If Sunita scored 198 marks in the examination, how many marks did Vinita scored ?
Level 2 (16/06/2022) Shift 1
(a) 220 (b) 180 (c) 200 (d) 242

Q.85. A football team lost 40% of the matches it played. If it won 75 matches, then find the number of matches it played.
Level 2 (16/06/2022) Shift 1
(a) 140 (b) 110 (c) 125 (d) 130

Q.86. Two students appeared for an entrance examination. One of them secured 15 marks more than the other and his marks are 80% of the sum of their marks. What are the marks obtained by each of them ?
Level 2 (16/06/2022) Shift 3
(a) 6 and 21 (b) 4 and 19
(c) 8 and 23 (d) 5 and 20

Q.87. Jack obtained 45% marks in a test and failed by 18 marks. If he obtained 65% marks, he would have got 6 marks more than the minimum marks required to pass the test. How much were the maximum marks one could obtain in that test ?
Level 3 (17/06/2022) Shift 1
(a) 80 (b) 130 (c) 120 (d) 140

Q.88. Rakesh Secured 92% in a test and Kiran secured 96% in the same test. If the test is conducted out of 375 marks, what is the sum of the marks secured by both Rakesh and Kiran ?
Level 3 (17/06/2022) Shift 1
(a) 705 (b) 700 (c) 720 (d) 715

Q.89. Two children A and B have some toffees. If A has 8 toffees, and B has one toffee more than 50 % of the total toffees with them, then how many toffees does B have ?
Level 3 (17/06/2022) Shift 2
(a) 10 (b) 9 (c) 12 (d) 8

Q.90. The income of A is 25% less than the income of B whose income is 40% more than that of C. The Income of C is 20% less than that of D. By what percent is the income of A more than the income of C ?
Level 3 (17/06/2022) Shift 3
(a) 5 % (b) 10 % (c) 4 % (d) 8 %

RRB NTPC CBT - 1
(28/12/2020 to 31/07/2021)

Q.91. A class of 50 girls and 70 boys sponsored a musical programme. If 40% of the girls and 50% of the boys attended, approximately what percentage of the class attended the programme?
RRB NTPC 28/12/2020 (Morning)
(a) 42% (b) 48% (c) 44% (d) 45 %

Q.92. In order to qualify in an examination, one has to secure 50% of the overall marks. In the examination consisting of two papers, a student secured 40% in the first paper of 200 marks. Minimum what percentage of marks should be secured in the second paper of 150 marks in order to qualify in the examination?
RRB NTPC 28/12/2020 (Morning)
(a) 60.33% (b) 68.33%
(c) 65.33% (d) 63.33%

Q.93. In an election, there were only two candidates. The winning candidate got 48% of the total votes. His opponent got 6800 votes which was 34% of the total votes. Some of the votes were invalid. The winning margin of the candidate who won the election and the number of invalid votes respectively are :
RRB NTPC 28/12/2020 (Evening)
(a) 3200 votes, 3600 votes
(b) 2800 votes, 3600 votes
(c) 3600 votes, 2800 votes
(d) 3000 votes, 3600 votes

Q.94. A number when decreased by $22\frac{1}{2}$ % becomes 217. The number is
RRB NTPC 29/12/2020 (Evening)
(a) 420 (b) 280 (c) 212 (d) 315

Q.95. On the first day 84500 people visited a trade fair. On the 4^{th} day number reduced to 16900. By what percentage people reduced on the 4^{th}day ?
RRB NTPC 30/12/2020 (Morning)
(a) 80% (b) 75% (c) 0% (d) 20%

Q.96. If the difference between a number and its 25% is 24, then the number is:
RRB NTPC 30/12/2020 (Morning)

(a) 34 (b) 28 (c) 32 (d) 40

Q.97. 27% of 250 - 0.02% of 1000 is equal to :
RRB NTPC 04/01/2021 (Morning)
(a) 65.52 (b) 76.30 (c) 67.30 (d) 52.56

Q.98. A number is first decreased by 20% and then increased by 15%. The number so obtained is 64 less than the original number. The original number is :
RRB NTPC 04/01/2021 (Evening)
(a) 800 (b) 850 (c) 600 (d) 700

Q.99. A student required 20% marks to pass in psychology. He/she secured 10% marks and failed by 20 marks. What is the passing marks ?
RRB NTPC 05/01/2021 (Morning)
(a) 40 (b) 60 (c) 20 (d) 50

Q.100. If the price of a grocery item consumed by a family increases by 25%, then by what percentage should its consumption reduce, so as to keep the expenditure on this item unchanged?
RRB NTPC 05/01/2021 (Morning)
(a) 20% (b) 25% (c) 67% (d) 50%

Q.101. The present population of a town is 50,000. If the population of the town increases by 4% annually, then what will be the population after 2 years?
RRB NTPC 05/01/2021 (Evening)
(a) 54,280 (b) 54,080
(c) 58,400 (d) 54,840

Q.102. If 35% of x is 140, then what is the value of x?
RRB NTPC 05/01/2021 (Evening)
(a) 300 (b) 400 (c) 335 (d) 450

Q.103. The value of a car depreciates at the rate of 20% every year. After two years the value of the car will be Rs.4,80,000. The original price of the car is :
RRB NTPC 07/01/2021 (Morning)
(a) Rs. 5,50,300/- (b) Rs. 6,00,000/-
(c) Rs. 7,50,000/- (d) Rs. 6,20,000/-

Q.104. In an examination a student scored 65% marks but was 20 marks below the qualifying marks. Another student scored 80% marks and scored 5% more marks than the qualifying marks. Total marks of the examination are.
RRB NTPC 07/01/2021 (Morning)
(a) 500 (b) 200 (c) 300 (d) 400

Q.105. The population of a town increases by 10% every year. If the present population is 20,000. in the next year it will be:
RRB NTPC 07/01/2021 (Evening)
(a) 18,000 (b) 2,200 (c) 1,800 (d) 22,000

Q.106. The price of sugar increased by 10%. A family of 5 members did not want to increase their expenditure. What is the percentage reduction in their consumption of sugar?
RRB NTPC 08/01/2021 (Morning)
(a) 8 (b) $9\frac{1}{11}$ (c) 10 (d) 12

Q.107. In a school the ratio of the number of boys and girls is 5 : 6. 20% boys and 25% girls are scholarship holders. How many students did not get a scholarship?
RRB NTPC 08/01/2021 (Morning)
(a) $(\frac{750}{11})$ % (b) $(\frac{950}{11})$ %
(c) $(\frac{850}{11})$ % (d) $(\frac{8000}{11})$ %

Q.108. Due to a 25% reduction in the price of wheat per kg, John is able to buy 5 kg more for Rs 600. What is the original price of wheat per kg?
RRB NTPC 08/01/2021 (Evening)
(a) Rs. 60 (b) Rs. 50 (c) Rs. 45 (d) Rs. 40

Q.109. A man bought 2 articles for Rs 3,000 each. He sold one article at 10% profit and another article at 5% profit. Find the total percentage profit he earned?
RRB NTPC 08/01/2021 (Evening)
(a) 15% (b) 7.5% (c) 8.5% (d) 6.5%

Q.110. If the length of side of a square is increased by 10%, what is the percentage increase in its area?
RRB NTPC 08/01/2021 (Evening)
(a) 10% (b) 20% (c) 21% (d) 15%

Q.111. Zamir buys an article with off-season discount of 40% and sells at 25% discount on the marked price. Find his percentage profit/loss?
RRB NTPC 09/01/2021 (Morning)
(a) 15% Profit (b) 25% loss
(c) 15% loss (d) 25% profit

Q.112. 20% of the toys produced in a factory are defected and 25% of the remaining were damaged. If 4800 toys are in good condition, then what was the original number of toys produced?
RRB NTPC 10/01/2021 (Evening)
(a) 9000 (b) 8000 (c) 6000 (d)10000

Q.113. In a class 82% students passed and 2% are placed in the reappear category. The number of students who failed are 592. What was the total number of students in the class?
RRB NTPC 10/01/2021 (Evening)
(a) 2700 (b) 3600 (c) 3700 (d) 2000

Q.114. If A's height is 25% less than that of B, then approximately by what percentage is B's height more than that of A.
RRB NTPC 10/01/2021 (Evening)
(a) 75% (b) 25% (c) 33% (d) 50%

Q.115. Mahesh sold $\frac{3}{4}$ of the stock at a gain of 20% and the remaining stock at a gain of 15%. Find the total gain percentage (approximate)
RRB NTPC 11/01/2021 (Morning)
(a) 19% (b) 17% (c) 20% (d) 15%

Q.116. If 370 students appeared for an examination, of which 352 passed. Then find the pass percentage (approximately) ?
RRB NTPC 11/01/2021 (Morning)
(a) 86% (b) 90% (c) 97% (d) 95%

Q.117. In an examination, 35% students failed in one subject and 42% failed in the other subject. Among these 30% failed in both subjects. If the total number of students is 2500 then how many students failed only in one subject?
RRB NTPC 12/01/2021 (Morning)
(a) 750 (b) 425 (c) 1050 (d) 1750

Q.118. In an election, candidate A got 75% of total valid votes. If 15% of total votes were declared invaild and the total number of votes is 560000, then the number of valid votes polled in favour of A is.
RRB NTPC 13/01/2021 (Morning)
(a) 355000 (b) 357000
(c) 356000 (d) 358000

Q.119. The number x and y are such that x : y = 4 : 5. If x is more than z by 20%, then y will be more than z by.
RRB NTPC 13/01/2021 (Morning)
(a) 60% (b) 30% (c) 40% (d) 50%

Q.120. If x% of y = y% of z , then
RRB NTPC 13/01/2021 (Morning)
(a) x = z (b) x = 4z (c) x = 2z (d) x = 3z

Q.121. If the population of a village increased from 1,75,000 to 2,62,500 in 5 years, then find the average percentage increase in the population per year.
RRB NTPC 13/01/2021 (Evening)
(a) 9% (b) 12% (c) 10% (d) 15%

Q.122. 1000 boys and 600 girls are examined in a test. If 40% of the boys and 35% of the girls passed, then find the percentage (approximately) of the total number of candidates who failed in the

test.
RRB NTPC 13/01/2021 (Evening)
(a) 31.75% (b) 70.25%
(c) 61.88% (d) 50.89%

Q.123. The total population of a village is 4,000. The number of males and females increases by 10% and 20% respectively and consequently the population of the village becomes 4500. What was the number of males in the village prior to the new members coming in ?
RRB NTPC 16/01/2021 (Morning)
(a) 3000 (b) 4000 (c) 2500 (d) 2000

Q.124. Two employees Anita and Sarita are paid a total sum of Rs. 6600 per month. If Anita is paid 120% of the sum paid to Sarita, then what amount will Sarita get ?
RRB NTPC 17/01/2021 (Morning)
(a) 4500 (b) 3000 (c) 30000 (d) 5000

Q.125. In a lottery, 96.5% of the participants did not win any prize but 700 participants won a prize. The total number of participants is.
RRB NTPC 17/01/2021 (Morning)
(a) 7000 (b) 67550 (c) 20000 (d) 10000

Q.126. 7.98 expressed as a percent of 1.9 is:
RRB NTPC 17/01/2021 (Evening)
(a) 42% (b) 420% (c) 4.2% (d) 7%

Q.127. The value of the machine depreciates at the rate of 10% per annum. If the present value is Rs. 1,62,000. What was the value of the machine 2 years ago ?
RRB NTPC 18/01/2021 (Morning)
(a) 50,000 (b) 2,00,000
(c) 1,31,220 (d) 54,66,123

Q.128. 50% of a number is 21 less than $\frac{4}{5}th$ of that number .Find the number.
RRB NTPC 19/01/2021 (Morning)
(a) 40 (b) 70 (c) 50 (d) 60

Q.129. Rakhi scored 12 marks more than Mohan. If Rakhi scored 54% marks out of a maximum of 200. How much did Mohan score ?
RRB NTPC 20/01/2021 (Morning)
(a) 46 marks (b) 69 marks
(c) 34 marks (d) 96 marks

Q.130. If the amount in a bill is deceased by 10% , then Rs. 279 is to be paid . How much is the original bill?
RRB NTPC 20/01/2021 (Morning)
(a) 280 (b) 330 (c) 300 (d) 310

Q.131. x% of y is y% of:
RRB NTPC 20/01/2021 (Evening)
(a) x (b) $\frac{y}{10}$ (c) $\frac{x}{10}$ (d) 100x

Q.132. The ratio of the number of boys to that of the girls in a school is 3 : 2. If 20% of the boys and 25% of the girls are scholarship holders, find the percentage of those who are NOT scholarship holders.
RRB NTPC 21/01/2021 (Evening)
(a) 68% (b) 78% (c) 87% (d) 86%

Q.133. Farman has to secure 60% marks to pass. He got 60 marks and fail by 60 marks. What are the maximum marks ?
RRB NTPC 22/01/2021 (Morning)
(a) 180 (b) 120 (c) 100 (d) 200

Q.134. The population of a town increases by 5% annually and its present population is 640000. What will its population be in 2 years time?
RRB NTPC 22/01/2021 (Morning)
(a) 745880 (b) 705600
(c) 744880 (d) 704600

Q.135. If 20% of 160 + 10% of 50 = x - 1 , then what will be the value of x?
RRB NTPC 22/01/2021 (Evening)
(a) 19 (b) - 38 (c) 38 (d) 36

Q.136. 50% of a number added to 20% of 40 gives a sum of 20. What is the number ?
RRB NTPC 22/01/2021 (Evening)
(a) 20 (b) 24 (c) 40 (d) 32

Q.137. Fill in the blank _____% of 50 = 40.
RRB NTPC 23/01/2021 (Morning)
(a) 60 (b) 80 (c) 70 (d) 90

Q.138. If Sachin secures 70% marks in mathematics and 60% in science. What percentage of marks did Sachin get in both subjects together, assuming both subjects to have equal maximum marks?
RRB NTPC 23/01/2021 (Morning)
(a) 60% (b) 65% (c) 55% (d) 70%

Q.139. 250 candidates appeared for an examination. Out of which 225 passed. The percentage of the candidates who passed is.
RRB NTPC 23/01/2021 (Evening)
(a) 90% (b) 96% (c) 93% (d) 84%

Q.140. In maths, a student got 16% more marks in the second term than that in the first term. If he got 87 marks in the second term. What were his marks in the first term?
RRB NTPC 25/01/2021 (Morning)
(a) 78 (b) 60 (c) 75 (d) 80

Q.141. Each edge of a cube is increased by 50% . Find the percentage increase in its surface area.
RRB NTPC 25/01/2021 (Morning)
(a) 100% (b) 125% (c) 130% (d) 120%

Q.142. The price of tea has been reduced by 20%. In order to restore the original price, the new price must be increased by ?
RRB NTPC 25/01/2021 (Evening)
(a) 25% (b) 35% (c) 30% (d) 20%

Q.143. Atulit has 100 apples. He gives 10% of the apples to Arnav, 15% of the apples to Keshav and $\frac{2}{5}th$ of the apples to Rinku. How many apples are left with Atulit after the distribution?
RRB NTPC 27/01/2021 (Morning)
(a) 45 (b) 25 (c) 35 (d) 15

Q.144. When water is changed into ice, its volume increases by 10%. If ice is changed into water, the percentage decrease in its volume will be:
RRB NTPC 27/01/2021 (Morning)
(a) $\frac{100}{15}$% (b) $\frac{100}{16}$% (c) $\frac{100}{11}$% (d) $\frac{100}{120}$%

Q.145. In the new budget, the price of petrol was risen by 20%. By how much percentage must a motorist reduce consumption of petrol so that his expenditure on it does NOT increase?
RRB NTPC 28/01/2021(Morning)
(a) $16\frac{3}{4}$% (b) $16\frac{4}{5}$% (c) $16\frac{2}{3}$% (d) $16\frac{1}{2}$%

Q.146. The length and breadth of a square are increased by 30% and 20% respectively. The area of the resulting rectangle exceeds the area of the square by:
RRB NTPC 28/01/2021 (Evening)
(a) 25% (b) 40% (c) 56% (d) 50%

Q.147. When the price of a gun was increased by 25% , the number of guns sold decreased by 15%. What was the effect on the sales?
RRB NTPC 28/01/2021 (Evening)
(a) 6.25% increase (b) 3.75 % decrease
(c) 10% increase (d) 5.5 % decrease

Q.148. If the price of tea increases by 20%, by what percentage should a household reduce its consumption of tea so that the budget remains the same?
RRB NTPC 29/01/2021 (Evening)
(a) $16\frac{2}{3}$% (b) $14\frac{2}{3}$% (c) $15\frac{2}{3}$% (d) $13\frac{2}{3}$%

Q.149. 50% of 500 = _____ of 2500
RRB NTPC 29/01/2021 (Evening)
(a) 30% (b) 20% (c) 40% (d) 10%

Q.150. The population of a town

increases at the rate of 10% every year. The present population is 1,000. In how many years will the population become 1,331?
RRB NTPC 29/01/2021 (Evening)
(a) 2.5 (b) 3.5 (c) 2 (d) 3

Q.151. Salim bought an article for Rs 784 which included GST of 12%. What was the price of article before GST was added?
RRB NTPC 30/01/2021 (Evening)
(a) 700 (b) 650 (c) 550 (d) 600

Q.152. If 2 L of water is evaporated on boiling from 8 L of sugar solution containing 4% sugar, find the percentage of sugar in the remaining solution?
RRB NTPC 30/01/2021 (Evening)
(a) 16% (b) $\frac{16}{3}$% (c) 15% (d) $\frac{16}{5}$%

Q.153. A survey of 40 students showed that 25% children liked playing football. How many children did not like playing football?
RRB NTPC 30/01/2021 (Evening)
(a) 38 (b) 30 (c) 35 (d) 26

Q.154. Rahul had to appear for a test in four subjects. In the first three subjects the maximum marks were 50 each, in which Rahul secured 60% on an average. In the fourth subject Rahul scored 54 marks and his overall percentage rose to 64%. What were the maximum marks in the fourth subject ?
RRB NTPC 31/01/2021 (Morning)
(a) 60 (b) 84 (c) 75 (d) 80

Q.155. The difference between 48% and 38% of a number is 354. What is 58% of that number?
RRB NTPC 31/01/2021 (Evening)
(a) 2034.6 (b) 1987.56
(c) 1893.78 (d) 2053.2

Q.156. A vendor purchases an article for Rs 5,00 and sells it for Rs. 550. What is the percentage gain?
RRB NTPC 02/02/2021 (Morning)
(a) 15% (b) 10% (c) 5% (d) 20%

Q.157. If the length of a rectangle is increased by 70%, what would be the percentage decrease (correct to the nearest integer) in the width to maintain the same area?
RRB NTPC 02/02/2021 (Evening)
(a) 61% (b) 60% (c) 41% (d) 58%

Q.158. In a given population, 20% of the population is affected with asthma out of which 90% of asthma patients used to work in flour mills. If 30% of the total population was working in flour mills, then what will be the percentage of the people working in flour mills who are suffering from asthma?
RRB NTPC 02/02/2021 (Evening)
(a) 60% (b) 30% (c) 40% (d) 50%

Q.159. In an examination, 80% students passed in Physics, 70% students passed in Chemistry, while 15% failed in both the subjects. If 325 students passed in both the subjects, find the total number of students who appeared in the examination ?
RRB NTPC 03/02/2021 (Morning)
(a) 450 (b) 550 (c) 500 (d) 200

Q.160. The price of mobile is first decreased by 20% and then increased by 10%. The net change in the price will be:
RRB NTPC 03/02/2021 (Morning)
(a) 15% (b) 14% (c) 10% (d) 12%

Q.161. The population of a town is 10,000. If the male population increases by 5% and the female population by 10% the population will become 10,800. How many of the town's present population is female ?
RRB NTPC 03/02/2021 (Evening)
(a) 5000 (b) 8000 (c) 6000 (d) 7000

Q.162. The annual increase in percentage of a population is 5% and the present number of people is 16000. What will be the population in 3 years?
RRB NTPC 03/02/2021 (Evening)
(a) 29,448 (b) 24,448
(c) 18,522 (d) 20,448

Q.163. Sohan decreased his expenses by 25% .Later, he decreased them further by 10%. By what percentage did his expenses decrease altogether?
RRB NTPC 04/02/2021 (Morning)
(a) 32.5% (b) 34.5% (c) 33.5% (d) 31.5%

Q.164. Richa purchased a car for Rs. 6,50,000 and sold it for Rs. 7,80,000. What is the percentage profit she made on the car?
RRB NTPC 04/02/2021 (Evening)
(a) 20% (b) 25% (c) 10% (d) 15%

Q.165. A man's working hours per day were increased by 35% and his wages per hour were decreased by 25%. By what percentage were his daily earnings increased ?
RRB NTPC 04/02/2021 (Evening)
(a) 1.3 (b) 1.2 (c) 1.25 (d) 1.35

Q.166. If A's salary is 20% less than B's salary, by how much percentage is B's salary more than A's?
RRB NTPC 05/02/2021 (Morning)
(a) 20% (b) $16\frac{2}{3}$% (c) $33\frac{1}{3}$% (d) 25%

Q.167. A bacterial population increases at the rate of 6% in the first 10 minutes and then 10% in the next 10 minutes, what is the overall percentage increase in the population at the end of 20 minutes.
RRB NTPC 08/02/2021 (Evening)
(a) 16% (b) 16.3% (c) 16.5% (d) 16.6%

Q.168. The rate of a certain variety of rice increases by 20%. A man gets that variety of rice 3 kg less for Rs.630 in comparison with the quantity that he would have got at the old rate. Find the old rate of that variety of rice.
RRB NTPC 09/02/2021 (Evening)
(a) Rs. 36 per kg (b) Rs. 35 per kg
(c) Rs. 37 per kg (d) Rs. 34 per kg

Q.169. Terry consumes 1700 ml of milk every day. How many liters of milk will she consume in 5 weeks?
RRB NTPC 09/02/2021 (Evening)
(a) 59.5 L (b) 59 L (c) 60 L (d) 58.5 L

Q.170. The number of illiterate persons in a country decreased from 150 lakhs to 100 lakhs in 10 years. What is the percentage of decrease?
RRB NTPC 10/02/2021 (Morning)
(a) $33\frac{2}{3}$ (b) 33 (c) $22\frac{1}{3}$ (d) $33\frac{1}{3}$

Q.171. A student multiplied a number by $\frac{3}{5}$ instead of $\frac{5}{3}$. What is the percentage error in the calculation?
RRB NTPC 10/02/2021 (Evening)
(a) 46% (b) 10% (c) 20% (d) 64%

Q.172. In an election between two candidates, 75% of the voters enrolled in the election cast their votes, out of which 2% were declared invalid. A candidate got 9261 votes, which were 75% of the valid votes. The total number of voters enrolled in that election were:
RRB NTPC 10/02/2021 (Evening)
(a) 16800 (b) 18000 (c) 16000 (d) 16400

Q.173. An examination requires 33% marks in order to pass. A candidate who gets 210 marks fails by 21 marks. What are the total marks for the examination ?
RRB NTPC 11/02/2021 (Morning)
(a) 400 (b) 700 (c) 350 (d) 500

Q.174. A man's health insurance premium for last year was Rs 1,440 . If he paid Rs 1,512 this year, what is the

percentage increase on his health insurance premium.
RRB NTPC 11/02/2021 (Evening)
(a) 5% (b) 4% (c) 3% (d) 6%

Q.175. If the numerator of a fraction is decreased by 80% and the denominator of the fraction is decreased by 60%, then the resultant fraction is $\frac{5}{6}$, $what$ is the original fraction?
RRB NTPC 15/02/2021 (Morning)
(a) $\frac{6}{5}$ (b) $\frac{5}{3}$ (c) $\frac{3}{5}$ (d) $\frac{7}{3}$

Q.176. In an examination, 45% of the students qualified and 79750 are not qualified. How many students applied for the examination ?
RRB NTPC 15/02/2021 (Evening)
(a) 145000 (b) 145250
(c) 154000 (d) 140000

Q.177. Out of 500 students in a college, 350 play cricket, 125 play Kabaddi, 75 neither play cricket nor kabaddi. Find the percentage of the number of students who play both kabaddi and cricket.
RRB NTPC 15/02/2021 (Evening)
(a) 15% (b) 12% (c) 10% (d) 20%

Q.178. If 30% of x is equal to five-sixth of y. Find x : y.
RRB NTPC 16/02/2021 (Morning)
(a) 25 : 9 (b) 9 : 25 (c) 5 : 3 (d) 3 : 5

Q.179. In the school, there were 1400 boys and 600 girls. 40% of girls and 60% of boys passed the examination. What is the percentage of failed candidates?
RRB NTPC 16/02/2021 (Morning)
(a) 46% (b) 65% (c) 72% (d) 63%

Q.180. If the Cost price of an article is 40% of its selling price, then what percent is the selling price of its cost price ?
RRB NTPC 16/02/2021 (Evening)
(a) 250% (b) 200% (c) 150% (d) 175%

Q.181. Select the number that can replace the question mark(?) in the following equation.
120% of 3125 - 90% of ? = 150
RRB NTPC 16/02/2021 (Evening)
(a) 40 (b) 400 (c) 4000 (d) 3600

Q.182. If 60% of a number is added to 36, gives the number itself then the number is:
RRB NTPC 17/02/2021 (Morning)
(a) 100 (b) 80 (c) 90 (d) 75

Q.183. If Raju's earning is 40% less than Venkat's earning, by how much percentage is Venkat's earning more than Raju's earning?
RRB NTPC 22/02/2021 (Evening)
(a) 200% (b) 100% (c) $\frac{200}{3}$% (d) $\frac{400}{3}$%

Q.184. If 60% of (a - b) is the same as 40% of (a + b), then what percentage of a is b?
RRB NTPC 22/02/2021 (Evening)
(a) 20 (b) 26 (c) 22 (d) 24

Q.185. If 15% of A is equal to 18% of B, then what percentage of B is equal to 20% of A ?
RRB NTPC 23/02/2021 (Morning)
(a) 25% (b) 42% (c) 24% (d) 20%

Q.186. The difference between two numbers is 35% of the larger number. If the smaller number is 195, then the larger number is :
RRB NTPC 27/02/2021 (Evening)
(a) 320 (b) 330 (c) 350 (d) 300

Q.187. X is 6 times as large as Y. By what percentage is Y lesser than X?
RRB NTPC 27/02/2021 (Evening)
(a) $83\frac{1}{3}$% (b) $8\frac{1}{3}$% (c) $83\frac{3}{3}$% (d) $83\frac{2}{3}$%

Q.188. Vikas spends 80% of his salary. His salary has increased by 25% and his expenditure has increased by 15%. What is the percentage increase in his savings ?
RRB NTPC 01/03/2021 (Morning)
(a) 60% (b) 50% (c) 55% (d) 65%

Q.189. 30% of 50% of 85% of an amount is 51. What is the amount ?
RRB NTPC 01/03/2021 (Evening)
(a) 250 (b) 350 (c) 300 (d) 400

Q.190. In a college, there are 3600 students, out of which 82% are football players. 7% are kabaddi players, 4% are chess players and the remaining are cricket players. The number of cricket players is:
RRB NTPC 02/03/2021 (Morning)
(a) 152 (b) 136 (c) 252 (d) 126

Q.191. If A is 120% of B, then what percentage of (A + B) is B ?
RRB NTPC 02/03/2021 (Evening)
(a) $5\frac{4}{11}$ (b) $40\frac{5}{11}$ (c) $45\frac{5}{11}$ (d) $4\frac{5}{11}$

Q.192. if 20% of A is equal to 25% of B, then 28% of A is equal to what percent of B ?
RRB NTPC 03/03/2021 (Morning)
(a) 35 (b) 30 (c) 53 (d) 25

Q.193. A student must score 40% marks to pass an examination. He gets 70 marks and fails by 20 marks. Find the maximum marks.
RRB NTPC 03/03/2021 (Evening)
(a) 225 (b) 125 (c) 175 (d) 360

Q.194. A fruit seller has some oranges. He sells 60% of them and still has 380 oranges. Originally, he had _____ oranges.
RRB NTPC 05/03/2021 (Evening)
(a) 940 (b) 930 (c) 950 (d) 920

Q.195. What percentage of a day is 3 h?
RRB NTPC 05/03/2021 (Evening)
(a) $10\frac{1}{2}$% (b) $12\frac{1}{2}$% (c) $16\frac{1}{2}$% (d) $14\frac{1}{2}$%

Q.196. Ravi's Salary is 20% more than Mohan's salary. If Mohan's salary is Rs.1600, then Ravi's salary is:
RRB NTPC 07/03/2021 (Evening)
(a) 1,800 (b) 1,750 (c) 1,920 (d) 1,890

Q.197. If 45% of a number is 15 less than 70% of that number, then the number is:
RRB NTPC 08/03/2021 (Evening)
(a) 60 (b) 50 (c) 40 (d) 70

Q.198. Which number is 40% less than 80 ?
RRB NTPC 09/03/2021 (Evening)
(a) 68 (b) 48 (c) 38 (d) 58

Q.199. Ravi and Rajesh wrote an entrance examination to join the M.Tech. programme. Ravi obtained 8 marks more than Rajesh and his marks were 52% of the sum of their marks. What are marks obtained by Ravi and Rajesh respectively?
RRB NTPC 11/03/2021 (Morning)
(a) 90,98 (b) 108,100 (c) 104,96 (d) 100,92

Q.200. In an examination, 28% of the students failed in Hindi and 32% failed in English. If 20% of the students failed in both the subjects then the percentage of students who passed in both the subjects is:
RRB NTPC 11/03/2021 (Evening)
(a) 56% (b) 48% (c) 60% (d) 52%

Q.201. If 15% of (x - y) = 9% of (x + y), then y is what percentage of x?
RRB NTPC 11/03/2021 (Evening)
(a) 25% (b) 300% (c) 400% (d) 150%

Q.202. Two numbers are respectively 30% and 80% more than a third number. These two numbers are in the ratio of.
RRB NTPC 12/03/2021 (Morning)
(a) 8 : 13 (b) 13 : 18 (c) 3 : 8 (d) 7 : 2

Q.203. If A is 125% of B, then B is what percentage of (A - B) ?
RRB NTPC 12/03/2021 (Morning)

(a) 200% (b) 300% (c) 150% (d) 400%

Q.204. Find the approximate percentage of aggregate marks scored by Ramesh , who obtained 50% , 60 % and 70% marks in three examinations with maximum marks 100 , 130 and 150 respectively.
RRB NTPC 12/03/2021 (Evening)
(a) 61.32 (b) 71.23 (c) 55.5 (d) 70.1

Q.205. In a town, the population increased from 1,85,500 to 2,22,600 in a decade. The average percentage increase of population per year is:
RRB NTPC 13/03/2021 (Morning)
(a) 3% (b) 9% (c) 5% (d) 2%

Q.206. Ravi's Salary is 20% more than Mohan's salary .If Mohan's salary is Rs. 1,600 then Ravi's Salary will be:
RRB NTPC 13/03/2021 (Evening)
(a) 1,890 (b) 1,920 (c) 1,750 (d) 1,800

Q.207. The sum of the salaries of A and B together is Rs. 4300. A spends 95% of his salary and B, 80% of his salary. If their savings are the same, what is A's salary?
RRB NTPC 14/03/2021 (Morning)
(a) 3440 (b) 3430 (c) 3445 (d) 3442

Q.208. In a class, the ratio of girls and boys is 13 : 12 . Find the percentage of the girls in the class.
RRB NTPC 14/03/2021 (Morning)
(a) 48% (b) 52% (c) 25% (d) 13%

Q.209. If the radius of a circle is reduced by 15%, then its area is reduced by.
RRB NTPC 14/03/2021 (Evening)
(a) 17.75% (b) 12.75% (c) 17% (d) 27.75%

Q.210. 82% of the number is 738 . What is 90% of that number?
RRB NTPC 15/03/2021 (Morning)
(a) 802 (b) 900 (c) 820 (d) 810

Q.211. A man buys an article for Rs 55.00 and sells it for Rs 57.20. Find his gain percentage.
RRB NTPC 19/03/2021 (Morning)
(a) 6% (b) 8% (c) 4% (d) 2%

Q.212. If A's income is 60% less than that of B's income, then by what percentage is B's income more than that of A?
RRB NTPC 19/03/2021 (Evening)
(a) 100% (b) 150% (c) 175% (d) 125%

Q.213. If A exceeds B by 30% and B is less than C by 20% , then A : C is:
RRB NTPC 19/03/2021 (Evening)
(a) 25 : 26 (b) 26 : 25
(c) 25 : 52 (d) 10 : 13

Q.214. Hema decided to donate 15% of her salary to a charitable trust. On the day of donation she changed her mind and donated Rs. 4,500 which is 125% of what she had decided earlier. Find Hema's salary.
RRB NTPC 21/03/2021 (Evening)
(a) 30,000 (b) 24,000
(c) 18,000 (d) 32,000

Q.215. After deducting 10% from a certain sum, and then deducting 20% from the remainder, a sum of Rs. 3,600 is left. Find the original sum (in Rs.).
RRB NTPC 21/03/2021 (Evening)
(a) 6,000 (b) 3,800 (c) 5,000 (d) 4,000

Q.216. Find the value of x if, 20% of 75 = 225 - x% of 420.
RRB NTPC 01/04/2021 (Morning)
(a) 50 (b) 3 (c) 1535 (d) 20

Q.217. What percentage of $\frac{3}{11}$ is $\frac{1}{121}$?
RRB NTPC 01/04/2021 (Evening)
(a) $3\frac{1}{3}$% (b) $33\frac{1}{3}$% (c) $66\frac{1}{3}$% (d) $3\frac{1}{33}$%

Q.218. If x% of y is 2000 and y% of z is 4000, then the relation between x and z is:
RRB NTPC 06/04/2021 (Morning)
(a) z = 2x (b) z + 2 = x
(c) z = $\frac{x}{2}$ (d) z - 2 = x

Q.219. When 30% of a number is added to another number, the second number becomes 140% of itself. The ratio of the first number to the second number is:
RRB NTPC 06/04/2021 (Morning)
(a) 2 : 4 (b) 3 : 2 (c) 1 : 3 (d) 4 : 3

Q.220. A shopkeeper divided a sum of Rs. 2,50,000 between his three sons in a proportion of 30%, 45% and 25% respectively. How much did each sum inherit ?
RRB NTPC 07/04/2021 (Evening)
(a) 75,000, 1,13,500 & 61,500
(b) 75,000, 1,14,500 & 60,500
(c) 75,000, 1,12,500 & 63,000
(d) 75,000, 1,12,500 & 62,500

Q.221. In an examination, 90% of the students passed and 600 students failed. How many students appeared for the examination?
RRB NTPC 08/04/2021 (Morning)
(a) 5500 (b) 5250 (c) 6000 (d) 5750

Q.222. 44% of a number is 798.6. What is 63% of that number?
RRB NTPC 08/04/2021 (Morning)
(a) 1143.47 (b) 1143.8
(c) 1143.46 (d) 1143.45

Q.223. If X's income is 40% less than that of Y, then Y's income is approximately what percentage more than that of X ?
RRB NTPC 08/04/2021 (Morning)
(a) 67.33% (b) 66.33%
(c) 67.67% (d) 66.67%

Q.224. If the salary of an employee is increased by 15% and subsequently reduced by 15%, then what will be the overall percentage reduction in the salary ?
RRB NTPC 08/04/2021 (Evening)
(a) 2.50 (b) 3.25 (c) 2.25 (d) 2.75

Q.225. What is $\frac{2}{5}$ as a percentage ?
RRB NTPC 24/07/2021 (Morning)
(a) 40% (b) 50% (c) 20% (d) 75

Q.226. If Mohan secured 72 % marks in Physics and 68% in chemistry, what percentage of marks did Mohan get in both subjects together, assuming that the two subjects have equal weightage ?
RRB NTPC 26/07/2021 (Morning)
(a) 70% (b) 55% (c) 65% (d) 60%

Q.227. If a is 7.5 % of b , b is 1.50% of c and d is 5% of c , then find a : d.
RRB NTPC 26/07/2021 (Evening)
(a) 9 : 400 (b) 8 : 100
(c) 8 : 300 (d) 9 : 100

Q.228. In an examination, 80% of the students passed in English , 85% passed in mathematics and 75% passed in both, English and mathematics. If 40 students failed in both the subjects, the total number of students is:
RRB NTPC 31/07/2021 (Evening)
(a) 158 (b) 400 (c) 44 (d) 100

RRB JE
(22/05/2019 to 28/06/2019)

Q.229. 70% of the employees in a firm are men. 30% of men and 20% of women employees opt for voluntary retirement. What is the percentage of the total number of employees continue in service ?
RRB JE 22/05/2019 (Afternoon)
(a) 70% (b) 27% (c) 30% (d) 73%

Q.230. The population of a city has been increasing at 5% every year. The present population is 185220. What was its population 3 years back ?
RRB JE 22/05/2019 (Evening)
(a) 180500 (b) 180000
(c) 160000 (d) 178000

Q.231. P gets 360 marks out of a total score of 500. Marks of P are 10% less than Q's score. Q got 25% more than R, and R got 20% less than S. What is the

percentage marks of S ?
RRB JE 23/05/2019 (Afternoon)
(a) 72% (b) 68% (c) 75% (d) 80%

Q.232. If $(\frac{25}{8})$% of 128 = x , find the value of 'x'.
RRB JE 23/05/2019 (Evening)
(a) 4 (b) 12 (c) 8 (d) 3

Q.233. In a survey conducted in a locality, It was found that 50% read newspaper A, 40% read newspaper B, and 20 % read neither A nor B. If the number of persons who read both A and B is 500, then how many persons were surveyed?
RRB JE 24/05/2019 (Evening)
(a) 7000 (b) 3000 (c) 5000 (d) 4500

Q.234. When the number 42 is misread as 24, what is the percentage error ?
RRB JE 25/05/2019 (Afternoon)
(a) 18% (b) 42.86% (c) 55.34% (d) 28%

Q.235. The length of a rectangle is halved, and its breadth is tripled. What is the percentage change in its area ?
RRB JE 26/05/2019 (Morning)
(a) 75% decrease (b) 25% increase
(c) 50% decrease (d) 50% increase

Q.236. What is the percentage form of the ratio 1 : 8?
RRB JE 28/05/2019 (Afternoon)
(a) 80% (b) 6.25% (c) 12.5% (d) 8%

Q.237. If $\frac{5}{8}$ = x%, what is the value of 'x' ?
RRB JE 28/05/2019 (Afternoon)
(a) 62.5 (b) 65.7 (c) 67.5 (d) 40

Q.238. The salaries of Anand and Nirmal are in the ratio of 9 : 4. When Anand's salary is increased by 15%, it becomes Rs.5175. What is the salary of Nirmal ?
RRB JE 29/05/2019 (Afternoon)
(a) Rs.2000 (b) Rs.4000
(c) Rs.5000 (d) Rs.4500

Q.239. Arun's income is 150% of Bala's income. Income of Chandru is 120% of the income of Arun. If the total income of Arun, Bala and Chandru is Rs.86000, then what is the income of Chandru?
RRB JE 30/05/2019 (Morning)
(a)Rs.36000 (b)Rs.32000
(c)Rs.30000 (d)Rs.34000

Q.240. If 5% of A + 4% of B = $\frac{2}{3}$ (6% of A+ 8% of B), then what is A : B?
RRB JE 30/05/2019 (Evening)
(a) 1 : 1 (b) 4 : 3 (c) 1 : 2 (d) 5 : 4

Q.241. Goods worth Rs.6500 with a rebate of 5% were purchased. Then sales tax at 4% was included in the bill. What is the amount of the bill ?
RRB JE 31/05/2019 (Evening)
(a) Rs.6522 (b) Rs.6576
(c) Rs.6422 (d) Rs.6600

Q.242. A cycle bought at Rs. 1400 is sold at a loss of 15%. What is the selling price ?
RRB JE 01/06/2019 (Morning)
(a) Rs.1090 (b) Rs. 1385
(c) Rs.1190 (d) Rs. 1290

Q.243. If consumption of sugar increases from 12 kg to 15 kg, then what is the percentage increase ?
RRB JE 01/06/2019 (Evening)
(a) 39.2% (b) 25% (c) 20% (d) 33.3%

Q.244. After selling 30% of the fruits, a fruit seller had 140 fruits left. How many were there originally ?
RRB JE 02/06/2019 (Morning)
(a) 300 (b) 200 (c) 288 (d) 350

Q.245. What percentage of 5% is 3% ?
RRB JE 02/06/2019 (Evening)
(a) 15% (b) 60% (c) 30% (d) 50%

Q.246. The ratio of the number of boys and girls in a school is 3 : 2. If 20% of the boys and 25% of the girls are scholarship holders, what percentage of the students do not get scholarships?
RRB JE 02/06/2019 (Evening)
(a) 80% (b) 56% (c) 78% (d) 70 %

Q.247. The cost of rice increases to Rs.30 per kg from Rs.25 per kg. By how much percentage the consumption is reduced to maintain the same expenditure ?
RRB JE 27/06/2019 (Morning)
(a) $16\frac{2}{3}$% (b) $8\frac{1}{3}$% (c) 10% (d) 16%

Q.248. Difference between 52% and 24% of a number is 112. What is 12.5% of the number?
RRB JE 27/06/2019 (Morning)
(a) 65 (b) 60 (c) 50 (d) 40

Q.249. When the price of a cycle was reduced by 20%, the number of cycles sold increased by 20%. What was the effect on the sales of the shop?
RRB JE 27/06/2019 (Evening)
(a) 4% decrease (b) 4% increase
(c) 10% increase (d) 10% decrease

Q.250. If a bucket when 80% full contains 2 litres more water than when it is $66\frac{2}{3}$% full. What is the capacity of the bucket?
RRB JE 27/06/2019 (Evening)
(a) 20 litres (b) 10 litres
(c) 15 litres (d) 12 litres

RRB ALP Tier - 2
(21/01/2019 to 08/02/2019)

Q.251. If 25% of a = b, then b% of 160 is equal to:
ALP Tier II 21/01/2019 (Afternoon)
(a) 60% of a (b) 50% of a
(c) 80% of a (d) 40% of a

Q.252. 10% of 1000% of 100 = ?
ALP Tier II 21/01/2019 (Evening)
(a) 100 (b) 105 (c) 102 (d) 110

Q.253. A number after increasing by 36 becomes equal to its 109% then what is that number?
ALP Tier II 23/01/2019 (Morning)
(a) 300 (b) 360 (c) 400 (d) 450

Q.254. Two numbers are 10% and 20% less than a third number. By what percent should the second number be increased to make it equal to the first number?
ALP Tier II 23/01/2019 (Afternoon)
(a) 12.5% (b) 10% (c) 8% (d) 7.5%

Q.255. A fruit seller had some apples. He sold 30% of the apples and still has 630 apples. Actually he had _____ apples.
ALP Tier II 08/02/2019 (Morning)
(a) 800 (b) 850 (c) 1,000 (d) 900

RPF Constable
(17/01/2019 to 19/02/2019)

Q.256. The price of a piece of metal rose from 115 to 138 rupees. Find the percentage of growth. (In%)
RPF Constable 17/01/2019 (Morning)
(a) 10 (b) 20 (c) 25 (d) 15

Q.257. The price of LPG cylinders has increased from Rs 456 to Rs 570. What percentage of consumption should be reduced so that the amount spent on LPG cylinders will remain the same ? (In%)
RPF Constable 17/01/2019 (Morning)
(a)15 (b)20 (c) 5 (d)10

Q.258. There are 60 detergent soap in one box, 36 of them are used. So what is the percentage of the remaining detergent soaps in the box? (In%)
RPF Constable 17/01/2019 (Morning)
(a) 40 (b) 30 (c) 50 (d) 60

Q.259. In a National Level Test 500 students appeared for the examination,

out of these students 42% of the students got 81-100 percentile, 25% of the students got 61-80 percentile and the remaining students has got 41-60 percentile. Find the number of students who has 41-60 percentile.
RPF Constable 18/01/2019 (Morning)
(a) 165 (b) 175 (c) 145 (d) 155

Q.260. If Sunil ate 16 galaxy chocolates from a box which contains 25 chocolates. What percentage of the chocolates are remaining in the box ?
RPF Constable 18/01/2019 (Morning)
(a) 38% (b) 34% (c) 36% (d) 32%

Q.261. The price of Milk is increased from Rs.25 to Rs.28. Find the percentage increase in the price value.
RPF Constable 18/01/2019 (Morning)
(a) 12% (b) 11% (c) 13% (d) 14%

Q.262. The value of 25% of 66.67% of 75% of 80% of a number is 5213. The value of 40% of that number is ?
RPF Constable 18/01/2019 (Afternoon)
(a) 21852 (b) 23852 (c) 20852 (d) 22852

Q.263. The price of a metal piece increased from 145 to 174 rupees. Find the percentage of growth.
RPF Constable 18/01/2019 (Afternoon)
(a) 20 (b) 10 (c) 15 (d) 25

Q.264. The price of LPG cylinders increased from 480 to 600 rupees. By what percentage should consumption be reduced so that the amount spent on LPG cylinders remains the same ?
RPF Constable 18/01/2019 (Afternoon)
(a) 20 (b) 10 (c) 15 (d) 25

Q.265. The price of a piece of metal has been increased from Rs.130 to Rs.156. What percentage increase in this? (%)
RPF Constable 18/01/2019 (Evening)
(a) 20 (b) 10 (c) 25 (d) 15

Q.266. 25% of the 66.67% of 75% of 80% of a number is 4915. Find 40% of this number.
RPF Constable 18/01/2019 (Evening)
(a) 20660 (b) 22660 (c) 21660 (d) 19660

Q.267. LPG cylinder costs Rs. 468 to Rs. 585 has been done. What percentage of consumption should be reduced so that the amount spent on LPG cylinders remains the same? (% In)
RPF Constable 18/01/2019 (Evening)
(a) 5 (b) 10 (c) 20 (d) 15

Q.268. In one box there are 70 detergent soaps, 28 of which have been taken. How many percent detergent soap remains in the box? (% In)
RPF Constable 18/01/2019 (Evening)
(a) 60 (b) 80 (c) 70 (d) 50

Q.269. The price of milk is increased from Rs.36 to Rs.40. Find the percentage of increase in its cost.
RPF Constable 19/01/2019 (Morning)
(a) 11.11% (b) 11.22%
(c) 11.18% (d) 11.25%

Q.270. When a shopkeeper buys an item at the rate of Rs.785 and sells it at the rate of Rs 942, then know the percentage of profit earned by the shopkeeper.
RPF Constable 19/01/2019 (Morning)
(a) 20% (b) 10% (c) 15% (d) 25%

Q.271. 25% of the 66.67% of 75% of the 80% of a number is 512. Find 40% of this number.
RPF Constable 19/01/2019 (Morning)
(a) 2040 (b) 2048 (c) 2068 (d) 2058

Q.272. 650 students took part in a national level examination. Of these, 47% of students received 81- 100% marks, 23% students received 61-80% marks and the remaining students got 41-60% marks. Find out the number of students who received 41 - 60 percent.
RPF Constable 19/01/2019 (Morning)
(a) 180 (b) 120 (c) 165 (d) 195

RPF S.I. (19/12/2018 to 16/01/2019)

Q.273. A bulb manufacturing company found that 11% of their total output was wasted. If the number of correct products is 2047, then find the number of defective products?
RPF S.I. 19/12/2018 (Morning)
(a) 234 (b) 454 (c) 253 (d) 324

Q.274. Mark donates 14% of his salary to an organization for the blind, 16% to an organization for orphans, 12% to an organization for the physically challenged, and 13% of his salary to help set up a medical camp. He deposits the remaining ₹ 24570 in the bank for monthly expenses. How much amount does he donate to the organization for the disabled?
RPF S.I. 19/12/2018 (Morning)
(a) ₹6882 (b) ₹7422 (c) ₹6552 (d) ₹8644

Q.275. A bulb manufacturing company found that 11% of their total output was wasted. If the number of correct products is 4984, then find the number of defective products?
RPF S.I. 19/12/2018 (Evening)
(a) 616 (b) 456 (c) 676 (d) 586

Q.276. The station master decided to increase the length of a rectangular digital board by 4% and decrease the width by 4%. Find the total change in the area of the board?
RPF S.I. 19/12/2018 (Evening)
(a) 0.09% increase (b) 0.09% decrease
(c) 0.16% decrease (d) 0.16% increase

Q.277. Terlin scores 65 out of 80 in French, 75 out of 100 in English, 45 out of 70 in Spanish, and 25 out of 50 in Japanese. Find the total percentage of marks obtained by him?
RPF S.I. 19/12/2018 (Evening)
(a) 80% (b) 70% (c) 90% (d) 60%

Q.278. A bulb manufacturing company found that 11% of their total products were damaged. If the number of safe products is 5785, then find the number of damaged products.
RPF S.I. 24/12/2018 (Morning)
(a) 675 (b) 575 (c) 715 (d) 825

Q.279. Vimal received 72 out of 80 marks in French, 91 out of 100 in English, 63 out of 70 in Spanish and 44 out of 50 in Japanese. What was the total percentage achieved by him? (% In)
RPF S.I. 05/01/2019 (Morning)
(a) 70 (b) 100 (c) 80 (d) 90

Q.280. A shopkeeper allows a discount of 37% on the sale of an article after marking it up by 37% on its cost price. Then find the percentage of total profit or loss obtained.
RPF S.I. 06/01/2019 (Morning)
(a) 13.69% Loss (b) 12.96% Loss
(c) 13.69% profit (d) 12.96% profit

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.281. 28% of a number is 35. What is the number?
RRB ALP 09/08/2018 (Evening)
(a) 125 (b) 80 (c) 120 (d) 108

Q.282. Veer spends 15% of his monthly income on the house rent and 60% of the rest on household expenditure. If he saves ₹2210, what is his monthly income?
RRB ALP 10/08/2018 (Morning)
(a) ₹ 8,000 (b) ₹ 7,500
(c) ₹ 6,500 (d) ₹ 7,000

Q.283. A total amount of ₹ 1560 is to be divided among A, B and C such that A gets 50% of what B gets and B gets 20% of what C gets. How much will B get?

RRB ALP 10/08/2018 (Evening)
(a) ₹280 (b) ₹540 (c) ₹440 (d) ₹240

Q.284. 54% of 4000 is:_____
RRB ALP 13/08/2018 (Morning)
(a) 2025 (b) 2160 (c) 2172 (d) 2232

Q.285. 30% of a number is 33. What is the number?
RRB ALP 14/08/2018 (Morning)
(a) 110 (b) 105 (c) 120 (d) 115

Q.286. Adithya got 78% marks in the examination. If he secured 663 marks, find the maximum marks.
RRB ALP 14/08/2018 (Morning)
(a) 800 (b) 700 (c) 750 (d) 850

Q.287. Tanya got an increment of 15% in her salary. If her enhanced salary is ₹ 14,030. What was her original salary?
RRB ALP 21/08/2018 (Morning)
(a) ₹ 12,400 (b) ₹ 12,000
(c) ₹ 12,200 (d) ₹ 12,300

Q.288. 15% of a number, when added to 30% of another, gives 24% of the sum of the two numbers. The bigger number is 4 more than the smaller one. What are the numbers?
RRB ALP 21/08/2018 (Afternoon)
(a) 6,10 (b) 12,16 (c)10,14 (d) 8,12

Q.289. If one needs to score 34% to pass a test, the pass marks out of 40 would be:
RRB ALP 21/08/2018 (Evening)
(a) 13.6 (b) 14.2 (c) 14.6 (d) 13.2

Q.290. In a test Paran secured 63 marks that was also equivalent to obtaining 84% marks. How many marks was the test out of?
RRB ALP 29/08/2018 (Morning)
(a) 65 (b) 75 (c) 80 (d) 85

Q.291. The price of the sugar goes up by 30%. By what percent should Sita reduce her consumption so that the expenditure does not increase?
RRB ALP 29/08/2018 (Morning)
(a) 22% (b) 23% (c) $22\frac{1}{13}\%$ (d)$23\frac{1}{13}\%$

Q.292. An electric bulb was bought at ₹ 4200 .Its value depreciates at the rate of 8% per annum. Its value after one year will be:
RRB ALP 29/08/2018 (Morning)
(a) ₹ 3,684 (b) ₹ 3,864
(c) ₹ 3,746 (d) ₹ 3,800

Q.293. In a test, Charan secured 54 marks that was also equivalent to obtaining 72% marks. How many marks was the test out of?
RRB ALP 30/08/2018 (Morning)
(a) 85 (b) 75 (c) 80 (d) 65

Q.294. Akash's monthly income is ₹ 9600. His monthly expenditure is 60% of his income. What is his saving per month?
RRB ALP 30/08/2018 (Morning)
(a) ₹ 3,870 (b) ₹ 3,850
(c) ₹ 3,840 (d) ₹ 3,940

Q.295. If Anju scored 68 out of 80 in Hindi, 46 out of 60 in Mathematics, 74 out of 90 in Science, and 34 out of 45 in English, in which subject did Anju score the maximum percentage marks?
RRB ALP 30/08/2018 (Afternoon)
(a) Mathematics (b) Hindi
(c) Science (d) English

Q.296. In a class, 60% of children like Mathematics, 45% like Science and 25% like both Mathematics and Science. What is the percentage of children who like at least one subject?
RRB ALP 31/08/2018 (Morning)
(a) 55% (b) 45% (c) 80% (d) 70%

Q.297. What percentage of 1 day is 18 minutes?
RRB ALP 31/08/2018 (Afternoon)
(a) 1.8% (b) 1.25% (c) 12.5% (d) 7.5%

Answer key:-

1.(a)	2.(d)	3.(c)	4.(a)
5.(a)	6.(d)	7.(c)	8.(b)
9.(c)	10.(a)	11.(a)	12.(a)
13.(b)	14.(b)	15.(a)	16.(a)
17.(c)	18.(c)	19.(c)	20.(b)
21.(b)	22.(b)	23.(a)	24.(d)
25.(d)	26.(d)	27.(c)	28.(d)
29.(c)	30.(d)	31.(d)	32.(a)
33.(a)	34.(c)	35.(b)	36.(a)
37.(b)	38.(a)	39.(a)	40.(a)
41.(c)	42.(b)	43.(a)	44.(b)
45.(b)	46.(d)	47.(a)	48.(b)
49.(d)	50.(c)	51.(b)	52.(a)
53.(d)	54.(a)	55.(b)	56.(d)
57.(c)	58.(a)	59.(a)	60.(d)
61.(d)	62.(d)	63.(b)	64.(a)
65.(d)	66.(b)	67.(c)	68.(d)
69.(d)	70.(a)	71.(c)	72.(a)
73.(a)	74.(c)	75.(b)	76.(d)
77.(d)	78.(d)	79.(b)	80.(c)

81.(a)	82.(c)	83.(d)	84.(c)
85.(c)	86.(d)	87.(c)	88.(a)
89.(a)	90.(a)	91.(d)	92.(d)
93.(b)	94.(b)	95.(a)	96.(c)
97.(c)	98.(a)	99.(a)	100.(a)
101.(b)	102.(b)	103.(c)	104.(b)
105.(d)	106.(b)	107.(c)	108.(d)
109.(b)	110.(c)	111.(d)	112.(b)
113.(c)	114.(c)	115.(a)	116.(d)
117.(b)	118.(b)	119.(d)	120.(a)
121.(c)	122.(c)	123.(a)	124.(b)
125.(c)	126.(b)	127.(b)	128.(b)
129.(d)	130.(d)	131.(a)	132.(b)
133.(d)	134.(b)	135.(c)	136.(b)
137.(b)	138.(b)	139.(a)	140.(c)
141.(b)	142.(a)	143.(c)	144.(c)
145.(c)	146.(c)	147.(a)	148.(a)
149.(d)	150.(d)	151.(a)	152.(b)
153.(b)	154.(c)	155.(d)	156.(b)
157.(c)	158.(a)	159.(c)	160.(d)
161.(c)	162.(c)	163.(a)	164.(a)
165.(c)	166.(d)	167.(d)	168.(b)
169.(a)	170.(d)	171.(d)	172.(a)
173.(b)	174.(a)	175.(b)	176.(a)
177.(c)	178.(a)	179.(a)	180.(a)
181.(c)	182.(c)	183.(c)	184.(a)
185.(c)	186.(d)	187.(a)	188.(d)
189.(d)	190.(c)	191.(c)	192.(a)
193.(a)	194.(c)	195.(b)	196.(c)
197.(a)	198.(b)	199.(c)	200.(c)
201.(a)	202.(b)	203.(d)	204.(a)
205.(d)	206.(b)	207.(a)	208.(b)
209.(d)	210.(d)	211.(c)	212.(b)
213.(b)	214.(b)	215.(c)	216.(a)
217.(d)	218.(a)	219.(d)	220.(d)
221.(c)	222.(d)	223.(d)	224.(c)
225.(a)	226.(a)	227.(a)	228.(b)
229.(d)	230.(c)	231.(d)	232.(a)
233.(c)	234.(b)	235.(d)	236.(c)
237.(a)	238.(a)	239.(a)	240.(b)
241.(c)	242.(c)	243.(b)	244.(b)
245.(b)	246.(c)	247.(a)	248.(c)
249.(a)	250.(c)	251.(d)	252.(a)
253.(c)	254.(a)	255.(d)	256.(b)
257.(b)	258.(a)	259.(a)	260.(c)
261.(a)	262.(c)	263.(a)	264.(a)

265.(a)	266.(d)	267.(c)	268.(a)
269.(a)	270.(a)	271.(b)	272.(d)
273.(c)	274.(c)	275.(a)	276.(c)
277.(b)	278.(c)	279.(d)	280.(a)
281.(a)	282.(c)	283.(d)	284.(b)
285.(a)	286.(d)	287.(c)	288.(d)
289.(a)	290.(b)	291.(d)	292.(b)
293.(b)	294.(c)	295.(b)	296.(c)
297.(b)			

Solutions:-

Sol.1.(a)

	Full marks	Scored marks	weightage
Term 1 →	80	80	×2
Term 2 →	90	75	×3

Total marks = 160 + 270 =430
Scored marks= 160 + 225 = 385
Required Percentage → $\frac{385}{430}$ ×100
= 89.53 ~ 90%

Sol.2.(d)
Income = Expenditure + Saving
100 = 72 + 28 (y)
112 = 75.6 + 36.6 (x)
Required value → $(\frac{x-y}{y}) \times 100$
= $\frac{36.6-28}{28} \times 100 = 30\%$

Sol.3.(c)
Annual income of Ram = ₹5,62,400
20% income spent on house rent
= $\frac{20}{100} \times 562400 = ₹112480$
Remaining amount = 562400 - 112480
= ₹449920
15% of the remaining income spent on food = $\frac{15}{100} \times 449920 = ₹67488$
Remaining amount = 449920 - 67488
= ₹382432
30% of the remaining income spent on children education = $\frac{30}{100} \times 382432$
$= ₹114729.6$
Actual savings of Ram = 382432 - 114729.6 = 267702.4 =267703 (approx)

Sol.4.(a) Let the cost of an apple= A
And the cost of a mango = M
ATQ ,
9A + 8M = ₹276 .....(1)
New rate of an apple = A × $\frac{9}{10} \Rightarrow \frac{9A}{10}$
Now ,
5 × $\frac{9A}{10}$ +10M = ₹210
⇒ 4.5A + 10M = ₹210 .... × 2
⇒ 9A + 20M = 420 .....(2)
By subtracting equation (1) from (2)
9A + 20M = 420
9A + 8M = 276
12M = 144 ⇒ M = 12
By putting value of M In equation (1)
9A + 96 = 276
⇒ 9A = 180 so , A = 20
Therefore, original cost of 4 apples and 3 mangoes = 4 × 20 + 3 × 12 = ₹ 116

Sol.5.(a) As per the question
x = $\frac{12500-10000}{10000} \times 100 = 25\%$
y = $\frac{14400-12000}{12000} \times 100 = 20\%$
Now,
$\frac{x-y}{y} \times 100 \Rightarrow \frac{25-20}{20} \times 100 = 25\%$

Sol.6.(d) Let cost of TV = 100 unit
So, cost of washing machine
= 100 × $\frac{60}{100}$ = 60 unit
Increase in cost of washing machine
= 60 × $\frac{18}{100}$ = 10.8 unit
Decrease in cost of TV = 100 × $\frac{10}{100}$
=10 unit
cost price of 5 washing machine and 2 TV
= 5 × 60 +100 × 2 = 500
Total changes in cost price of 5 washing machine and 2 TV = 10.8 × 5 - 10 × 2
= 54 - 20 = + 34
Required increase % = $\frac{34}{500}$ × 100 = 6.8%

Short trick :-
40% = $\frac{2}{5}$

T.V.	:	Washing machine
50	:	30
-10% → -5		+18% → 5.4

Total c.p. Of 5 washing machines and 2 TVs =(5 × 30) + (2 × 50) = 250
Total change in 5 washing machines and 2 TVs = (5.4 × 5) + (2 × (- 5)) = 17
%change = $\frac{17}{250}$ × 100 = 6.8%

Sol.7.(c)

Working hour	4	5
Wages	5	6
	20	30

His increased earning
= $\frac{10}{20} \times 100 = 50\%$

Sol.8.(b)
Production = Manpower × Hours

Manpower	10	7
Hours	7	10

Required% = $\frac{10-7}{7} \times 100$
= $\frac{3}{7} \times 100 = 42\frac{6}{7}\%$

Sol.9.(c) Let the C.P of the washing machine be 100 units.
S.P of X = C.P of Y = 120 units
S.P of Y = C.P of Z = 105.6 units
S.P of Z = C. P of T = 137.28 units
Profit of X = 120 - 100 = 20 units
Profit of Z = 137.28 - 105.6 = 31.68 units
Difference between profit of X and Z = 31.68 - 20 = 11.68 units
11.68 → 87.60
120 → 900
Hence, the C.P of Y = ₹900

Sol.10.(a) Ratio of young members to old members = 7 : 3
According to the question,
3 × 40 + 7 × 20 = 10 × k
120 + 140 = 10k
260 = 10k ⇒ k = 26
Hence, required average age = 26 years

Sol.11.(a) Sum of two numbers = 205
Let numbers = a and b
According to question,
a × $\frac{95}{100}$ = b × $\frac{110}{100}$
a : b = 22 : 19
Total sum = 22 + 19 = 41 unit
Now,
41 unit = 205
19 unit = 95
Hence, smaller number = 95

Sol.12.(a) Let length = l, breadth = b
Perimeter = 2(l + b) = 2(l + b)
New length = $\frac{9}{10}l$, breadth = $\frac{11}{10}b$
New perimeter = 2($\frac{9}{10}l + \frac{11}{10}b$)
= $\frac{1}{5}(9l + 11b)$
Positive change
= 2(l + b) - $\frac{1}{5}(9l + 11b)$ = $\frac{(l-b)}{5}$

Sol.13.(b) Distance = 1200 km
Distance travelled by foot = 25% of 1200
= 300 km
Distance travelled by bus = 30% of 1200
= 360 km
Distance travelled by train = 15% of 1200
= 180 km
Remaining distance = 1200 - 300 - 360 - 180
= 360 km
So, distance travelled by Airplane = 360 km

Sol.14.(b) A : B = 7 : 5 or 700 : 500
Total value of A + B = 1200
New value of A = 700 × $\frac{80}{100}$ = 560

New value of B = $500 \times \frac{138}{100} = 690$

New value of A + B = 560 + 690 = 1250

Required percentage =

$\frac{1250-1200}{1200} \times 100 = 4\frac{1}{6}\%$

Sol.15.(a) As per question,

A : B = 120 : 100

A + B : C = 220 : 187

C = 187 , A = 120

Required percentage = $\frac{187-120}{187} \times 100$

= 35.82%

Sol.16.(a)

Ratio → boys : girls = 2 : 3

According to the questions ,

Total students (5 units) = 140

So , unselected boys = $140 \times \frac{2}{5} \times \frac{1}{2}$

= 28

and unselected girls = $140 \times \frac{3}{5} \times \frac{2}{3}$

= 56

Required % = $\frac{28}{56} \times 100 = 50\%$

Sol.17.(c)

10% excess means:- 100 : 110

8% excess means:- 100 : 108

——————————————————

250 : 297 ⇒ difference is 47

So, Error% in area = $\frac{47}{250} \times 100 = \frac{94}{5}$

$= 18.8\%$

Sol.18.(c) 12% of 2400 = 288

18% of 5400 = 972

So, (972 - 288) = 684 is to be added to 12% of 2400, so that the sum will be equal to 18% of 5400.

Sol.19.(c) 55% candidates passed in English, 35% candidates passed in mathematics, 20% candidates passed in both the subjects.

So, the number of candidates passed in either of the two subjects

= (55% + 35%) - 20% = 70%

And, the number of candidates failed in both the subjects

= 100% - 70% = 30%

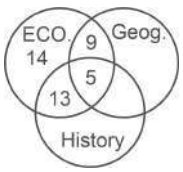
According to the question,

30% is equivalent to 1200

⇒ 100% is equivalent to 4000

So, the candidates who took the exam are 4000.

Sol.20.(b)



Students who failed in only economics

= 41 - (18 + 14 - 5) = 14%

Sol.21.(b) Ananya and Babita have respectively 20% and 28% less money than their friend Kavita.

I.e ratio of money of Ananya & Babita

= 10 : 9 ;

So, by the percentage Babita has less money than Ananya

= $\frac{10-9}{10} \times 100 = 10\%$

Sol.22.(b) Let the number = x

$\frac{4x}{3} - \frac{3x}{4} = \frac{7x}{12}$

% error = $\frac{\frac{7x}{12}}{\frac{4x}{3}} \times 100 = \frac{7x}{12} \times \frac{3}{4x} \times 100$

= 43.75 % ~ 44%

Sol.23.(a) Total votes = 50000

Urban voters = $\frac{20}{100} \times 50000 = 10000$

Rural voters = $\frac{80}{100} \times 50000 = 40000$

Voters shifted to urban area from rural area = 10,000

⇒ Now,

Urban votes = 10000 + 10000 = 20000 and Rural votes = 40000 - 10000 = 30000

Out of the voters in both rural and urban areas, 60% are honest, 70% are hardworking, and 35% are both honest and hardworking.

Voters who were both honest and hardworking voted for NOTA.

∴ Votes swept by NOTA = 35% of urban + 35% of rural = $\frac{35}{100} \times 20000 + \frac{35}{100} \times 30000 = 17500$

Candidate A found favour with the rural voters = 100% - 35% = 65% of rural voters

∴ Votes polled to A = $\frac{65}{100} \times 30000$

= 19500

Candidate B found favour with the urban voters = 100% - 35%

= 65% of urban voters

∴ Votes polled to B = $\frac{65}{100} \times 20000$

= 13000

⇒ Votes polled in favor of candidate A, candidate B and NOTA are 19500, 13000 and 17500 respectively

Sol.24.(d) Let , fraction = $\frac{100X}{100Y}$

A/Q , $\frac{130X}{65Y} = \frac{3}{15}$

$\frac{X}{Y} = \frac{3 \times 65}{15 \times 130} = \frac{1}{10}$

Sol.25.(d) 10% = $\frac{1}{10}$

Initial price = 10

Reduced price = 9

10% of 225 = 22.5

In 22.5, man got 25 kg extra sugar

Reduced price = $\frac{22.5}{25} = 90\ paisa$

9 = 90 paisa

Original price = 10 = 100 paisa = Rs 1

Sol.26.(d)

A/Q , The lengths of 2 adjacent sides of a square are increased by 35% and 25% .

Formula = X + Y + $\frac{X \times Y}{100}$

Let ,area of the square = 100%

So that , change % = 35 + 25 + $\frac{35 \times 25}{100}$

= 60 + 8.75 = 68.75%

The area of the resulting rectangle exceeds the area of the square by 68.75%.

Sol.27.(c) Let the fixed bill = x

And per unit bill = y

X + 540y = 1800 ____ (1)

X + 620y = 2040 ____ (2)

On solving equation (1) and (2), we get

X = 180 and y = 3

The bill for 500 unit = 180 + 500 × 3

= 1680

Sol.28.(d) Y × $\frac{X}{100}$ = 2000 --------(i)

Z × $\frac{Y}{100}$ = 4000 --------(ii)

From equation (i) & (ii)

Z = 2X

Sol.29.(c) 45% = $\frac{45}{100} = \frac{9}{20}$

Expenditure = price	×	consumption
Initial :	20	29
Final :	29	20

Expenditure remains fix so if price increase , in opposite ratio consumption will decrease

Hence, Consumption decreases by 9

% decrease in consumption = $\frac{9}{29} \times 100$

= $31\frac{1}{29}\%$

Sol.30.(d) Let , total marks in the exam = 100%

Passing marks = 33%

130 + 35 = 33% → 33% = 165

100 % = $\frac{100 \times 165}{33}$ = 500

Sol.31.(d) Price of Car = 6,25,000

Price paid by insurance company = $625000 \times \frac{80}{100} \times \frac{90}{100} = 4,50,000$

Difference = 6,25,000 - 4,50,000

= 1,75,000

Sol.32.(a)
Let the price of computer 3 years ago = x
A/Q,
$\Rightarrow x \times \frac{80}{100} \times \frac{80}{100} \times \frac{80}{100} = 12288$
$\Rightarrow \frac{64x}{125} = 12288$
$\Rightarrow x = \frac{12288 \times 125}{64} = Rs\ 24000$

Sol.33.(a) According to question ,
Price $\propto (weight)^3$
Initial weight of crystal = 10 units
Ratio of weight of broken crystal → 2 :3 : 5
Ratio → initial price : final price
$= (10)^3 : \left(2^3 + 3^3 + 5^3\right)$ = 1000 : 160
Percentage loss →
$\frac{1000 - 160}{1000} \times 100$ = 84%

Sol.34.(c) $\frac{(0.29 + 0.25 + 0.01)}{0.005}$ = a%
a = $\frac{(0.55) \times 100}{0.005} = \frac{55}{0.005}$ = 11000.

Sol.35.(b)
Area of rectangle = Length × Breadth
Required % change → 80 + 20 + $\frac{80 \times 20}{100}$
= 116%

Sol.36.(a) Fractional value of ,25 % = $\frac{1}{4}$, 66.67% = $\frac{2}{3}$, 75% = $\frac{3}{4}$ and 80% = $\frac{4}{5}$
Let, the no. be x
Then , according to question
$x \times \frac{1}{4} \times \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} = 4617$
x = $\frac{4617 \times 4 \times 3 \times 4 \times 5}{2 \times 3 \times 4}$ = 46170
40% of x = $\frac{46170 \times 40}{100}$ = 18468

Sol.37.(b) Total spend
= 13% + 12% + 14% + 16% = 55%
Remaining salary = Total salary - total spend = 100% - 55% = 45%
Now, 45% = 23445 ⇒ 1% = 521
then , 12 % = 521 × 12 = 6252 Rs.

Sol.38.(a) Percentage increase in his salary = $\frac{38640 - 34500}{34500} \times 100$
$= \frac{4140}{34500} \times 100 = 12\%$

Sol.39.(a) The population of town after 2 years = 224375 × $\frac{104}{100} \times \frac{104}{100}$ = 242684

Sol.40.(a)
40 % decrease means, 5 : 3
50% increase means, 2 : 3
New ratio = 10 : 9
Required % = $\frac{10 - 9}{10} \times 100 = 10\%$

Sol.41.(c) Percentage increase
= $\frac{1680 - 1500}{1500} \times 1\ 00$
= $\frac{180}{1500} \times 100 = 12\%$

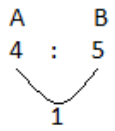
Sol.42.(b) 12% = $\frac{3}{25}$, 15% = $\frac{3}{20}$

First year	25 : 28
Second year	20 : 23
	500 : 644 or 125 : 161

161 units → 128800
Then, 125 units → 1,00,000
Mohan's salary two years ago was ₹1,00,000.

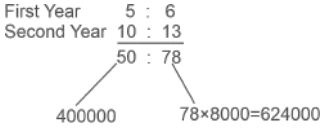
Sol.43.(a) let the monthly income of X = I
Expenditure of X = 16 + 40 + 14 = 70%
According to the question,
I × $\frac{30}{100}$ = 9630 ⇒ I = 32100
Therefor annual income = 32100 × 12
= ₹385200

Sol.44.(b)



Required % = $\frac{1}{4} \times 100 = 25\%$

Sol.45.(b)



The population after these two years = 6,24,000

Sol.46.(d) Required %
= $\frac{1854}{1854 + 618} \times 100$
= $\frac{1854}{2472} \times 100 = 75\%$

Sol.47.(a) $18\%\ of\ 200 = x$
$\Rightarrow x = \frac{18}{100} \times 200 = 36$

Sol.48.(b) Let the numerator of the fraction be x, and the denominator be y.
Numerator after increasing by 10%
= $\frac{11x}{10}$
$and\ denominator\ after\ reducing\ by\ 5\%$
= $\frac{95y}{100} = \frac{19y}{20}$
A.T.Q
$\frac{\frac{11x}{10}}{\frac{19y}{20}} = \frac{4}{5} \Rightarrow \frac{22x}{19y} = \frac{4}{5}$
$\Rightarrow \frac{x}{y} = \frac{4 \times 19}{5 \times 22} = \frac{38}{55}$

Sol.49.(d)

	Present Population	New Population
+8% ⟶	25	27
+12% ⟶	25	28
-22% ⟶	50	39
	15625	14742

Population of the town after 3 years
= $\frac{15625}{15625} \times 14742 = 14,742$

Sol.50.(c)

Price ⟶	25	38
Consumption ⟶	2	57/38
Expenditure	50	57

Ratio of consumption = 2 : $\frac{3}{2}$ or 4 : 3
Required consumption percentage be reduced = $\frac{1}{4} \times 100 = 25\%$

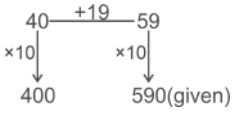
Sol.51.(b) Income of Raman = 45000 , saving = 45000 × $\frac{1}{8}$ ⇒ ₹ 5,625
And expenditure = 45000 - 5625
= ₹39,375
As per the question,
New income = 45000 × $\frac{118}{100}$ = ₹53,100
And new expenditure = 39375 × $\frac{120}{100}$
= ₹47,250
So, new saving = 53100 - 47250 = ₹5,850
increase in savings = 5850 - 5625 = 225

Sol.52.(a)
Marginal propensity to consume = $\frac{1}{2}$

Income	:	consumption
2		1

Increase in income = ₹500
So, increase in consumption = $\frac{500}{2}$
= ₹250

Sol.53.(d) $47\frac{1}{2}\%$ = $\frac{95}{200} = \frac{+19}{40}$



Sol.54.(a) Let the number = N
ATQ,
⇒ N × $\frac{40}{100} \times \frac{60}{100} \times \frac{5}{8}$ = 339
So, N = 2260

Sol.55.(b) 15% = $\frac{3}{20}$,12% = $\frac{3}{25}$, 10% = $\frac{1}{10}$ and 25% = $\frac{1}{4}$

By ratio method,

Before	:	after
20	:	17
25	:	22
10	:	9
4	:	5
20000	:	16830

Percentage decrease

$= \frac{20000-16830}{20000} \times 100 = 15.85\%$

Sol.56.(d)

Price	100	:	70
Sale	100	:	130
	100	:	119

19

Net revenue = $\frac{19}{100} \times 100$

$= 19\%$ increased

Sol.57.(c) Fractional value → 10% = $\frac{1}{10}$

Let ,the population during the 1st year be x .

According to question ,

$x \times \frac{11}{10} \times \frac{9}{10} = 473220$

$x = 473220 \times \frac{100}{99}$

$x = 478000$

Sol.58.(a)

35% of x = 40% of y

$\Rightarrow \frac{35}{100} x = \frac{40}{100} y$

$\Rightarrow \frac{x}{y} = \frac{40}{35}$ or $8 : 7$

Sol.59.(a) 50% = $\frac{1}{2}$

Reduced 50% ⟶	2	:	1
Increased 50% ⟶	2	:	3
Overall ⟶	4	:	3

His salary decreased by = $\frac{1}{4} \times 100$

$= 25\%$

Sol.60.(d) Let the monthly income = 100

Debt payment = 15

Remaining salary = 100 - 15 = 85

Expenditure = 85 × $\frac{75}{100}$ = 63.75

Savings = 85 - 63.75 = 21.25

According to the question,

21.25 unit = 425

100 unit = 2,000

So, Monthly salary = 2000

Sol.61.(d)

Present cost of the building = ₹1,28,000

After 1 year, cost of the building = ₹1,46,000

Required percentage increase

$= \frac{146000 - 128000}{128000} = 14\%$

Sol.62.(d) Let his total salary be ₹x.

He spends 20% of salary on house rent,

$= \frac{20}{100} x$

Remaining salary = $\frac{80}{100} x$

Money spent on household expenditure =

$\frac{50}{100} \times \frac{80}{100} x = \frac{40}{100} x$

Saving = $\frac{80}{100} x - = \frac{40}{100} x \frac{40}{100} x$

$\frac{40}{100} x = 10600 \Rightarrow x = 26,500$

Hence, his total salary = ₹26,500

Sol.63.(b)

Price	20	:	13
Sale	5	:	6
Revenue	100	:	78

Hence, effect on the total revenue

$= \frac{100 - 78}{100} \times 10 = 22\%$ decrease

Sol.64.(a)

Price→	5	:	6
Sale→	5	:	4
Revenue→	25	:	24

Decrement in revenue = $\frac{1}{25} \times 100 = 4\%$

Sol.65.(d) Let his total income be x.

$\frac{20x}{100} = 7500 \Rightarrow x = 37500$

Now, remaining amount after spent on petrol = 37500 - 7500 = 30000

Now, money spent on household expenditure = $\frac{1}{3} \times 30000 = 10,000$

Sol.66.(b)

2020	100	:	110
2021	100	:	92
	1000	:	1012

Overall increased population

$= \frac{12}{1000} \times 100 = 1.2\%$

Sol.67.(c) Net increased percentage

$= 10 + 8 + \frac{10 \times 8}{100} = 18.8\%$

Sol.68.(d) Required number

$= 5650 \times \frac{115}{100} = 6497.5$

Sol.69.(d) Old marks = 12,

New marks = 10

Percentage increase = $\frac{12 - 10}{10} \times 100$

= 20%

Sol.70.(a) Present population = 15,200

Let the initial population = n

n × $\frac{80}{100} \times \frac{95}{100}$ = 15,200

n = 20,000

Sol.71.(c) Income = 50,000

Expenditure on tax = 25%

Remaining amount = 50,000 × $\frac{75}{100}$

= 37500

Expenditure on household expenses = 30%

Remaining amount = 37500 × $\frac{70}{100}$

= 26,250

Expenditure on entertainment = 10%

Remaining amount = 26,250 × $\frac{90}{100}$

= 23625

Savings in one month = 23,625

Savings in 12 months = 23,625 × 12

= 2,83,500

Sol.72.(a) Let the number be n.

According to the question,

⇒ 23.5% of n = 11.75

⇒ $\frac{23.5}{100}$ × n = 11.75 , n = 50

Sol.73.(a)

Required percentage = $\frac{345}{600}$ × 100 = 57.5

Sol.74.(c) Let the total marks = x

Passed marks = 46% of x + 10

Also, Passed marks = 52% of x - 8

Now, 46% of x + 10 = 52% of x - 8

18 = 6% of x , x = 300

Qualifying marks = 46% of 300 + 10 = 148

Sol.75.(b) Let the first number = x and second number = y

As per question,

12.5% of x = 37.5% of y , $\frac{x}{8} = \frac{3y}{8}$

So, x : y = 3 : 1

Difference between 1st and 2nd number = 3 - 1 = 2 unit

Sum of 1st number and 2nd number = 3 + 1 = 4 unit

Again, as per question,

2 unit = 1428 , 4 unit = 2856

So, sum of the two number = 2856

Sol.76.(d) Expenditure on food + house rent + shopping + personal expenses = 20% + 20% + 5% + 10% = 55%

Savings = 100 - 55 = 45%

Savings = 45000 × $\frac{45}{100}$ = 20250

Donation = 20250 × $\frac{12}{100}$ = ₹2430

Sol.77.(d)

Required percentage = $\frac{54}{360} \times 100 =$ 15%

Sol.78.(d) $\frac{15\%\ of\ A}{25\%\ of\ B} = \frac{8}{11}$, $\frac{A}{B} = \frac{40}{33}$

Sol.79.(b) 20% = $\frac{4}{5}$

	Original	:	Reduced
price →	5	:	4
consumption →	4	:	5

1 unit = 4

5 unit = 20

So, reduced price = $\frac{1200}{20}$ = 60

Sol.80.(c)

$\frac{15}{100}A \times \frac{35}{100}B \div \frac{21}{100}C = 37$

$\frac{21\,AB}{400} \times \frac{100}{21\,C} = 37$

$\frac{AB}{C} = 37 \times 4 = 148$

Sol.81.(a) 8 B = A then, $\frac{B}{A} = \frac{1}{8}$

Required % = $\frac{7}{8} \times 100 = 87.5\%$

Sol.82.(c)

Let the total number of votes be x

$\frac{90x}{100} \times \frac{80}{100} \times \frac{60}{100} = 64800$

$x = \frac{64800 \times 100 \times 100 \times 100}{90 \times 80 \times 60} = 150000$

Sol.83.(d)

Other number = $\frac{252 \times 14}{28} = 126$

Required % = $\frac{126 - 28}{28} \times 100 = \frac{9800}{28}$

$= 350\%$

Sol.84.(c) Sunita scored 90% of what Anita scored while Anita score was 110% of what Vinita scored So, Vinita score

= $198 \times \frac{100}{90} \times \frac{100}{110} = 200$

Sol.85.(c) Let the total match be x

$\frac{40x}{100} + 75 = x$

$x - \frac{40x}{100} = 75 \Rightarrow x = \frac{75 \times 100}{60} = 125$

Sol.86.(d) Let the marks of first student be x and other student be x + 15

Now, $\frac{x+15}{2x+15} = \frac{80}{100}$

$\Rightarrow 5(x + 15) = 4(2x + 15)$

$\Rightarrow 5x + 75 = 8x + 60$

$\Rightarrow 3x = 15 \Rightarrow x = 5$

They get x, x + 15 = 5 marks and 20 marks

Sol.87.(c) Let the maximum marks be x

$\frac{45x}{100} + 18 = \frac{65x}{100} - 6$

$\Rightarrow \frac{20x}{100} = 24$

$\Rightarrow x = 120$

Sol.88.(a) Total marks obtained by Rakesh and Kiran = $\frac{92+96}{100} \times 375$

$= \frac{188}{100} \times 375 = 705$

Sol.89.(a)

Let the total number of toffees = x

8 + $(\frac{x}{2} + 1)$ = x , $\frac{x}{2} = 9 \Rightarrow x = 18$

B have = 18 - 8 = 10 toffees.

Sol.90.(a) Let D = 100

A : B : C : D = 84 : 112 : 80 : 100

A : B : C : D = 21 : 28 : 20 : 25

Required % =

$\frac{21-1}{20} \times 100 = \frac{1}{20} \times 100 = 5\%$

Sol.91.(d) A class of 50 girls and 70 boys sponsored a musical programme.

Number of girls attending the programme = $50 \times \frac{40}{100}$ = 20

Number of boys attending the programme = $70 \times \frac{50}{100}$ = 35

So, total number of students attending the programme = 20 + 35 = 55

i.e. approximate percentage of the class attending the programme is

= $\frac{55}{120} \times 100 = 45.83 \simeq 46\%$

Sol.92.(d) The student secured 40% in the first paper of 200 marks = 80 marks.

Let the student have to secure x marks in the second paper.

Then the overall percentage of marks

= $\frac{80+x}{350} \times 100 = \frac{2}{7} \times (80 + x)$

According to the question,

$\Rightarrow \frac{2}{7} \times (80 + x) = 50 \Rightarrow x = 95$

Minimum what percentage of marks should be secured in the second paper

= $\frac{95}{150} \times 100 = 63.333 \simeq 64\%$

Sol.93.(b) The winning candidate got 48% of the total votes.

His opponent got 6800 votes which were 34% of the total votes.

⇒ 34% is equivalent to = 6800 votes.

⇒ So, 48% is equivalent to = $\frac{6800 \times 48}{34}$

= 9600 votes.

⇒ {100 - (48 + 34)} = 18%, which is equivalent to = 3600 votes.

The winning margin of the candidate who won the election is (9600 - 6800) = 2800 and the number of invalid votes 3600.

Sol.94.(b) A number, when decreased by $22\frac{1}{2}$%, becomes 217.

As we know, $22\frac{1}{2}\%$ = $\frac{9}{40}$

i.e if the initial number was 40 units the after decrement it becomes (40 - 9) = 31 units

Now 31 units → 217 ,

So, the initial number = 40 units

⇒ $\frac{217}{31} \times 40$ = 280

Sol.95.(a) On the first-day number of people who visited the fair = 84500

On the 4th day number of people who visited the fair = 16900

The number of people visiting the fair was reduced by = 84500 - 16900 = 67600

i.e. percentage people reduced visiting the fair on the 4th day = $\frac{67600}{84500} \times 100 = 80\%$

Sol.96.(c) As the difference between a number and its 25% = 75% of the number

Let the number is N,

⇒ 75% of N = 24 ⇒ $\frac{3}{4}$ N = 24 ⇒ N = 32

Sol.97.(c) 27% of 250 - 0.02% of 1000

= $\frac{27}{100} \times 250 - \frac{0.02}{100} \times 1000$

= $\frac{135}{2} - \frac{1}{5}$ = 67.5 - 0.2 = 67.3

Sol.98.(a) Let the original number = x

New number is = x × $\frac{80}{100} \times \frac{115}{100} = \frac{23}{25}$x

ATQ, x - $\frac{23}{25}$x = 64

$\frac{2}{25}$x = 64 ⇒ x = $\frac{64 \times 25}{2}$ = 800

Sol.99.(a) Student secured 10% marks and failed by 20 marks.

⇒ (20% - 10%) = 10% is equivalent to 20 marks.

So, the passing percentage = 20% will be

= $\frac{20}{10} \times 20 = 40$ marks

i.e. the passing mark is 40.

Sol.100.(a) Price of a grocery item consumed by a family increases by 25%

$= \frac{1}{4}$

Let, the initial consumption : final consumption = x : y

So ATQ, ⇒ 4x = 5y

Now, to keep the expenditure on this item unchanged, its consumption should be reduced by

=$\{(\frac{x-y}{x}) \times 100\}\% = ($

$\times 10)\% = 20\%$

Sol.101.(b)

$\Rightarrow 50{,}000 \times \frac{104}{100} \times \frac{104}{100} = 54{,}080$

Sol.102.(b)

$\frac{35}{100} \times x = 140 \Rightarrow x = \frac{140 \times 100}{35} = 400$

Sol.103.(c)

Let the original price of the car is = P

According to the question,

$P \times \frac{80}{100} \times \frac{80}{100} = 480000$

$\Rightarrow P = 750000$

So, the original price of the car was 7,50,000.

Sol.104.(b)

Let the total marks of the exam = x,

A student scored 65% marks but was 20 marks below the qualifying marks.

$\Rightarrow$ passing /qualifying marks = $\frac{65}{100}$

$x + 20 = \frac{13x}{20} + 20$

Another student scored 80% marks and scored 5% more marks than the qualifying marks

$\Rightarrow \frac{80}{100}x - \frac{5}{100}x$

$\frac{80}{100}x = \frac{13x}{20} + 20 + \frac{5}{100}x$

$\Rightarrow \frac{(16-14)}{20}x = 20 \Rightarrow x = 200$

So, the total marks of the examination are 200.

Sol.105.(d) Population in the next year

$= 20{,}000 \times \frac{110}{100} = 22{,}000$

Sol.106.(b) $10\% = \frac{1}{10}$

Expenditure depends on price and quantity, Exp. = Price × Quantity

Price increases by 10% means, price = 10 →11

Expenditure remains constant it do not change, so quantity must be decreased.

Quantity = 11 →10

Change in quantity = 1

% change in quantity = $\frac{1}{11} \times 100 = 9\frac{1}{11}$

Sol.107.(c)

The ratio of boys and girls = 5 : 6

ATQ, 20% boys and 25% girls get scholarships, which means that 80% boys and 75% girls do not get scholarships.

80% of boys = 80% of 5 = 4

75% of girls = 75% of 6 = 4.5

Total students who do not get scholarships = 8.5

Total no. of students in school = 11

% of students who do not get scholarships = $\frac{8.5}{11} \times 100 = \frac{850}{11}\%$

Sol.108.(d) 25% of 600 = 150

The price for extra 5 kg wheat = Rs.150

Price for 1 kg wheat = $\frac{150}{5}$ = Rs.30

$25\% = \frac{1}{4}$

So, original price : final price = 4 : 3

$\therefore$ Original price = $\frac{30}{3} \times 4$ = Rs.40

Sol.109.(b) CP of both articles is the same.

Total profit = $3000 \times \frac{10}{100} + 3000 \times \frac{5}{100} = 300 + 150 = 450$

Total % profit = $\frac{450}{6000} \times 100 = 7.5\%$

Shortcut:

Total % profit = $\frac{10+5}{2} = 7.5\%$

Sol.110.(c) Percentage increase in area = $10 + 10 + \frac{10 \times 10}{100} \Rightarrow 20 + 1 = 21\%$

Sol.111.(d) Let the marked price be 100

Then the cost price = (100 - 40) = 60,

Again, the selling price = (100 - 25) = 75,

i.e. the profit percentage

$= \frac{(75-60)}{60} \times 100 = 25\%$

Sol.112.(b)

Let no. of toys produced = 100

Defected = 20

Remaining = 80

Damaged = $80 \times \frac{25}{100} = 20$

Toys in good condition = 100 - (20 + 20) = 60

Original no. of toys produced $= \frac{4800}{60} \times 100 = 8000$

Sol.113.(c)

Students failed = 100 - (82 + 2) = 16

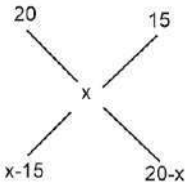
Total number of students = $\frac{592}{16} \times 100 = 3700$

Sol.114.(c) $25\% = \frac{1}{4}$,

A	B
3	4

B is more than A by = $\frac{1}{3} \times 100 = 33.33\%$

Sol.115.(a)



$\frac{x-15}{20-x} = \frac{3}{1}$

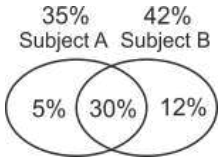
$\Rightarrow$ x -15 = 60 - 3x $\Rightarrow$ 4x = 75

$\Rightarrow$ x = 19% (approx)

Sol.116.(d) Pass % = $\frac{352}{370} \times 100$

= 95.13 = 95 (Approx)

Sol.117.(b)



According to question ,

Total no. of students (100%) = 2500

% of students who failed in one subject = 17%

No. of students who failed in one subject

$= 2500 \times \frac{17}{100} = 425$

Sol.118.(b) Number of valid votes in favour of A → $560000 \times \frac{85}{100} \times \frac{75}{100}$

= 3,57,000

Sol.119.(d) According to the question ,

y	:	x	:	z
5	:	4		
		6	:	5

---

y : x : z = 30 : 24 : 20

If x is more than z by 20%, then y will be more than z by. = $\frac{30-20}{20} \times 100 = 50\%$

Sol.120.(a) x% of y = y% of z

$\Rightarrow \frac{xy}{100} = \frac{yz}{100} \Rightarrow$ x = z

Sol.121.(c) the population of a village increased from 1,75,000 to 2,62,500 in 5 years = 87500

In average population increased per year $= \frac{87500}{5} = 17500$

So, the average percentage increase in the population per year = $\frac{17500}{175000} \times 100 = 10\%$

Sol.122.(c) 40% of 1000 boys = 400 boys.

35% of 600 girls = 210 girls.

So, total number of students passed in the test = (400 + 210) = 610

Then the percentage (approximately) of the total number of candidates who failed in the test

$= \frac{1600-610}{1600} \times 100 \simeq 61.88\%$

Sol.123.(a)

Let the number of males = 100x

Number of females = 4000 - 100x

Male increase by 10% , now males = 110x

Females increase by 20%, now Females

= (4000 - 100x) × $\frac{120}{100}$ ⇒ 4800 - 120x

A/Q, 110x + 4800 - 120x = 4500

⇒ - 10x = - 300 ⇒ x = 30

∴ Number of males = 100 × 30 = 3000

Sol.124.(b) 120% = $\frac{6}{5}$

Anita		Sarita
6	:	5

Share of Sarita = $\frac{5}{11} \times 6600 = Rs.\ 3000$

Sol.125.(c) Total number of participants

= $\frac{700}{3.5} \times 100 = 20000$

Sol.126.(b) $\frac{7.98}{1.9} \times 100$ = 420%

Sol.127.(b) The value of the machine depreciates at the rate of 10% per annum.

As the present value is Rs. 1,62,000.

So, the value of the machine 2 years ago was = $162000 \times \frac{100}{90} \times \frac{100}{90}$

$= 2,00,000$

Sol.128.(b)

ATQ, 50% of a number is 21 less than $\frac{4}{5}th$ of that number.

$\frac{4}{5}$of the number - $\frac{1}{2}$ of the number

= $\frac{3}{10}$ of the number

$\frac{3}{10}$ × number = 21 , The number = 70

Sol.129.(d) Rakhi scored 54% marks out of a maximum of 200 = 108 marks.

Rakhi scored 12 marks more than Mohan.

So, Mohan scored = 108 - 12 = 96 marks.

Sol.130.(d) The original bill will be

= $\frac{100}{90} \times 279 = Rs.310$

Sol.131.(a) $\frac{xy}{100} = \frac{y}{100} \times\ ?$ ⇒ ? = x

Sol.132.(b) Let, The number of the boys and girl = 300 unit and 200 unit

Scholarship holder boys = 300 × $\frac{1}{5}$

= 60 unit

And without scholarship holder boys

= 300 - 60 = 240 unit

Scholarship holder girls = 200 × $\frac{1}{4}$

= 50 unit

Without scholarship holder girls

= 200 - 50 = 150 unit

Hence,

The percentage student , without scholarship holders = $\frac{(240+150)}{500}$

× 100% ⇒ $\frac{390}{500} \times 100$ = 78%

Sol.133.(d)

Passing mark = total mark × $\frac{60}{100}$

According to question

120 = Total mark × $\frac{60}{100}$

Total mark = 200

Sol.134.(b) The population after 2 year

= 640000×$\frac{105}{100} \times \frac{105}{100}$= 705600

Sol.135.(c) 20% of 160 + 10% of 50 = x -1

160 × $\frac{1}{5}$ + 50 × $\frac{1}{10}$ = x - 1 ⇒ x = 38

Sol.136.(b) Let number = X

X × $\frac{1}{2}$ + $\frac{40}{5}$ = 20 ⇒ X = 24

Sol.137.(b) x% of 50 = 40

⇒ $\frac{x}{100} \times 50 = 40 \Rightarrow x = 80$

Sol.138.(b) Percentage of both subjects

= $\frac{60+70}{2} = 65\%$

Sol.139.(a) percentage of passed candidates = $\frac{225}{250} \times 100 = 90\%$

Sol.140.(c) Let, Ist term mark = x and 2nd term marks

= $\frac{x \times 116}{100}$

A/Q

⇒ $\frac{x \times 116}{100}$ = 87

⇒ x = 75

Sol.141.(b) Let side of cube = 100%

Edge of a cube is increased by 50%

then side of the cube = 150 %

% increase in its surface area

= $\frac{50 \times 50}{100} \times 100$ = 125 %

Sol.142.(a) Let , initial price of tea = Rs.100 , reduced by 20% = 80

Difference = 20 Rs .

Then new price must be increased

= $\frac{20}{80} \times 100$ = 25%

Sol.143.(c) Atulit has 100 apples.

He gives 10% = 10 apples to Arnav

15% = 15 apples to Keshav

$\frac{2}{5}th = 40$ apples to Rinku.

So,

Total apples distributed = 10 + 15 + 40

= 65

Apples Left = 35

Sol.144.(c)

Let the volume of water be 100ml.

After solidifying it will be 110 ml.

After melting it will be 100 ml again.

Hence decreasing (110 – 100) = 10 ml from 110 ml.

Therefore, the decreasing percentage will be $\frac{10}{110} \times 100$ % = $\frac{100}{11}$ %

Sol.145.(c) Let the original price be Rs.100.

Price after increment = (100 + 20%)

= Rs.120

Then,reduced consumption percentage

= $\frac{20}{120} \times 100$ = 16.6% = 16$\frac{2}{3}$%

Sol.146.(c)

Initial length = 100 and breadth = 100

A/Q , Final Length = 130% and Breadth = 120%

Change in Area (%) = $\frac{5600}{100}\% = 56\%$

Alternate Method:

Resulting Area of the Rectangle will increase by = $30 + 20 + \frac{30+20}{100}$ = 56%

Sol.147.(a)

Price → 100 : 125

Article → 100 : 85

Effect on the sales → 10000 : 10625

Now Effect on the sales % →

$\frac{625}{10000} \times 100$ = 6.25 % increase.

Sol.148.(a) 20% = $\frac{1}{5}$

Expenditure = price × $quantity$

(fix) = 5 6

6 5

Quantity decreases by 1

% decrease = $\frac{1}{6} \times 100 = 16\frac{2}{3}\%$

Sol.149.(d) 50% of 500 = _____ of 2500

⇒ 250 = x % of 2500

⇒ $250 = \frac{x \times 2500}{100}$

⇒ $250 = 25x \quad \Rightarrow x = 10\%$

Sol.150.(d) 10% = $\frac{1}{10}$

	Initial pop.	Final pop.
1st year	10	11
2nd year	10	11
3rd year	10	11
	1000	1331

Time = 3 years

Sol.151.(a)
SP = 784 Rs and Included GST = 12%
Price of article without added GST
= 100 unit
Price of article with added GST = 112 unit
Now , 112 unit = 784 Rs
100 unit = $\frac{784 \times 112}{100}$ = 700 Rs

Sol.152.(b)
Let , the total solution = 8000 ml
After the evaporation solution is
= 6000 ml
8 L of sugar solution containing 4% sugar
= 8000 × $\frac{4}{100}$ = 320 ml
Percentage of sugar in the remaining solution = $\frac{320 \times 100}{6000}$ = $\frac{16}{3}$%

Sol.153.(b) Total number = 40
25% of children liked playing football, which means 75% of students did not like playing football.
75% of students = 40 × $\frac{75}{100}$
= 30 student

Sol.154.(c)
Total marks of 3 subject = 150
Scored marks = $\frac{60}{100} \times 150 = 90$
Scored marks of all four papers
= 90 + 54 = 144
A/Q ,
64% = 144
100% = $\frac{144}{64} \times 100 = 225$
Marks of 4th paper = 225 - 150 = 75

Sol.155.(d)
Difference = 48 - 38 = 10% = 354
58% = $\frac{354}{10} \times 58$ = 2053.2

Sol.156.(b) Profit = 550 - 500 = 50
% profit = $\frac{50}{500} \times 100$ = 10%

Sol.157.(c)

Length	10	17
Breadth	17	10
Area	170	170

% decrease in breadth = $\frac{7}{17} \times 100$
= 41.17 %

Sol.158.(a) Let the population = 100
Population affected by asthma = 20 % = 20
Asthma patient work in flour mill
= 90% of 20 = 18
Total people working in flour mill
= 30% of 100 = 30
percentage of the people working in flour mills who are suffering from asthma
= $\frac{18}{30} \times 100 = 60\%$

Sol.159.(c) Let the total students appeared in the examination = 100
A/Q Total students = 80 + 70 + 15 = 165
Number of students passed in both subjects = 165 - 100 = 65
65 unit = 325
100 unit = $\frac{325}{65} \times 100 = 500$

Sol.160.(d) Net change
= - 20 + 10 - $\frac{20 \times 10}{100}$ = - 12%

Sol.161.(c)
Let the male population = 100x
Female population = 100 y
100x + 100y = 10000
x + y = 100 _____ (1)
A/Q,
105x + 110y = 10800 ____ (2)
On solving equation (1) and (2)
y = 60
Present population of female = 100 × 60 = 6000

Sol.162.(c) 5% = $\frac{1}{20}$
Population after 3 year = 16000 × $\frac{21}{20}$ × $\frac{21}{20} \times \frac{21}{20}$ = 18522

Sol.163.(a) - 25 - 10 + $\frac{25 \times 10}{100}$
= - 35 + 2.5 = - 32.5%

Sol.164.(a)
Profit = SP - CP = 7,80,000 - 6,50,000
= 1,30,000
Profit % = $\frac{130000}{650000} \times 100 = 20\%$

Sol.165.(c)
Earning = working hour ×wages per hour
Net increase in daily earning = +35 - 25 - $\frac{35 \times 25}{100}$ = +10 - 8.75 = +1.25%

Sol.166.(d)

	A		B
Ratio of the salary =	4	:	5

Difference between A and B salary
= 1 unit
B's salary more than A's in %
= $\frac{1}{4}$ × 100 = 25 %

Sol.167.(d) Overall % increase
= + 6 + 10 + $\frac{6 \times 10}{100}$ = 16 + 0.6 = 16 .6%

Sol.168.(b) 20% of 630 = 126
In 126 rs. man got 3 kg less rice
New price of rice = $\frac{126}{3} = 42\ Rs/kg$
20% = $\frac{1}{5}$, 6 unit = 42 rs
Original price = 5 unit = $\frac{42}{6} \times 5$
$= 35\ Rs/kg$

Sol.169.(a) 5 weeks = 35 days
Milk consumed per day = 1700 ml = 1.7 litre
Total milk consumed in 5 weeks
= $1.7 \times 35 = 59.5\ l$

Sol.170.(d) Initial persons = 150 lakhs and final persons = 100 lakhs
Difference between them = 50 lakhs
Decrease % = $\frac{50}{150}$ × 100 = $33\frac{1}{3}$%

Sol.171.(d) Let the number be 15x(LCM of denominator 5 and 3).
Wrong = $\frac{3}{5} \times 15x = 9x$
Correct = $\frac{5}{3} \times 15x = 25x$
% error in Calculation = $\frac{25x - 9x}{25x}$
= $\frac{16x}{25x} \times 100 = 64\%$

Sol.172.(a) 75% of valid votes cast = 9261
⇒ Valid votes = $\frac{9261}{75} \times 100$ = 12348
Percentage of valid votes = 75% - 2% of 75% = 75% - 1.5% = 73.5%
Therefore, 73.5% of total no. of votes = 12348
⇒ total no. votes = $\frac{12348}{73.5} \times 100$
= 16,800
Alternate:
⇒ Valid votes = $\frac{9261}{75} \times 100$ = 12348
Let no of votes = X × $\frac{3}{4} \times \frac{98}{100}$ =12348
⇒ total no. votes(X) = 16800

Sol.173.(b) Pass marks = 33%
A/Q ,

210 + 21 = 33%
231 marks = 33%
Total marks = 100% = $\frac{231}{33} \times 100 = 700$

Sol.174.(a) Increase in health insurance premium = 1512 - 1440 = 72
% increase = $\frac{72}{1440} \times 100 = 5\%$

Sol.175.(b) Let the original fraction = $\frac{x}{y}$
If numerator decreases by 80% numerator becomes = 0.2x
If denominator decrease by 60% it will be = 0.4 y
A/Q,
$\Rightarrow \frac{0.2x}{0.4y} = \frac{5}{6}$
$\Rightarrow \frac{x}{2y} = \frac{5}{6} \Rightarrow \frac{x}{y} = \frac{10}{6} = \frac{5}{3}$

Sol.176.(a) 55% = 79750
100 % = $\frac{79750 \times 100}{55}$ = 145000

Sol.177.(c)
students who play both kabaddi and cricket = (350 + 125 + 75) - 500 = 50
% students who play both kabaddi and cricket = $\frac{50}{500} \times 100 = 10\%$

Sol.178.(a) X × $\frac{30}{100} = \frac{5}{6} \times$ Y
X : Y = 25 : 9

Sol.179.(a) Boys = 1400 , Girls = 600
40% of girls = 600 × $\frac{40}{100}$ = 240 ,
60% of boys = 1400 × $\frac{60}{100}$ = 840
Total number of fail candidates = 60% of Girl + 40% of Boys = 360 + 560 = 920
Percentage of failed candidates
= $\frac{920}{2000}$ × 100 = 46%

Sol.180.(a) SP = 100 and CP = 40
Required percentage = $\frac{100}{40}$ × 100 = 250%

Sol.181.(c)
120% of 3125 - 90% of ? = 150
$\Rightarrow 3125 \times \frac{120}{100} - ? \times \frac{90}{100} = 150$
⇒ ? = 4000

Sol.182.(c) Let the number = x
$\frac{60x}{100} + 36 = x$
$\Rightarrow \frac{3x}{5} + 36 = x \Rightarrow x - \frac{3x}{5} = 36$
$\Rightarrow \frac{2x}{5} = 36 \Rightarrow x = \frac{36 \times 5}{2} = 90$
Alternate solution :
Use options , if we take 90 then its 60% is 54 and 54+36 = 90 so it will satisfy the question.

Sol.183.(c)
Let the Venkat's earning = 100
Raju's earning = 60
Venkat's earning More than Raju's earning = $\frac{40}{60} \times 100 = \frac{200}{3}\%$

Sol.184.(a) 60% of (a - b)
= 40% of (a + b)
$\Rightarrow 60(a - b) = 40(a + b)$
$\Rightarrow 60a - 60b = 40a + 40b$
$\Rightarrow 20a = 100b \Rightarrow \frac{a}{b} = \frac{100}{20}$
If a = 100 , b = 20
b is 20% of a

Sol.185.(c) 15% of A = 18 % of B
20% of A = $\frac{20}{15} \times 18\ \%\ of\ B = 24\%$ of B

Sol.186.(d) Larger number = X ,
Smaller number = 195
X × $\frac{35}{100}$ = X - 195 ⇒ X = 300

Sol.187.(a) Ratio between X : Y = 6 : 1
Y lesser than X in percentage
= $\frac{5}{6}$ × 100 = $83\frac{1}{3}\%$

Sol.188.(d) Let salary of Vikas = 100
Exp. = 80 and Saving = 20
If salary increased by 25% ,
New Salary = 125
If expenditure increased by 15%, new Exp. = 80 + 12 = 92
Saving = 125 - 92 = 33
Increase in saving = 33 - 20 = 13
% increase in saving = $\frac{13}{20} \times 100 = 65\%$

Sol.189.(d) let amount is x, then
X × $\frac{3}{10} \times \frac{1}{2} \times \frac{17}{20}$ = 51
⇒ X = 400.

Sol.190.(c)
Total number of students = 3600
Football = 82% , kabaddi = 7% ,
chess = 4% , cricket = 7%
The number of cricket players
= 3600 × $\frac{7}{100}$ = 252

Sol.191.(c) If B = 100, then A = 120
We have to find B is what % of (A + B)
= $\frac{100}{220} \times 100 = 45\frac{5}{11}\%$

Sol.192.(a) 20% of A = 25% of B
1% of A = $\frac{25}{20}\%\ of\ B$
28 % of A = $\frac{5}{4} \times 28\ \%\ of\ B$
$= 35\%\ of\ B$

Sol.193.(a) Total marks = 100%
Passing marks = 40% = 70 + 20 = 90
100% = $\frac{100 \times 90}{40}$ = 225

Sol.194.(c) Let the oranges = 100
Sold = 60, remaining = 100 - 60 = 40
40 unit = 380 oranges
100 unit = $\frac{380}{40} \times 100 = 950$

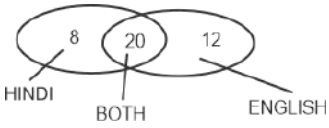
Sol.195.(b) Total hours in a day = 24 h
$\Rightarrow \frac{3}{24} \times 100 = 12\frac{1}{2}\%$

Sol.196.(c)
Ravi's salary = $1600 \times \frac{6}{5} = 1920$

Sol.197.(a) Let , number = x
(X × $\frac{70}{100}$) - (X × $\frac{45}{100}$) = 15
$\frac{25X}{100}$ = 15 ⇒ X = 60

Sol.198.(b)
Number = 80 × $\frac{60}{100} = \frac{4800}{100}$ = 48

Sol.199.(c)
Let the marks obtained by Rajesh = x
Marks of Ravi = x + 8
A/Q,
x + 8 = $\frac{52}{100} \times (2x + 8)$
$\Rightarrow 100x + 800 = 104x + 416$
$\Rightarrow 4x = 384 \Rightarrow x = 96$
Marks of Rajesh = 96
Marks of Ravi = 96 + 8 = 104

Sol.200.(c)


Total number of fail student = 8 + 20 + 12 = 40
The percentage of students who passed in both the subjects = 100 - 40 = 60 %

Sol.201.(a) (x - y) $\frac{15}{100}$ = (x + y) × $\frac{9}{100}$
(x - y) × 5 = (x + y) × 3
5x - 5y = 3x + 3y ⇒ 5x - 3x = 5y + 3y
2x = 8y ⇒ $\frac{x}{y} = \frac{4}{1}$
Now , A/Q , $\frac{y}{x} \times 100 = \frac{1}{4} \times 100 = 25\%$

Sol.202.(b) Let the 3rd number = 100

1st number = 130
2nd number = 180
Ratio = 130 : 180
= 13 : 18

Sol.203.(d) Let B = 100
A = 125
A - B = 125 - 100 = 25
Now,
$\frac{100}{25} \times 100 = 400\%$

Sol.204.(a) Total obtain marks
$= \frac{100 \times 50}{100} + \frac{130 \times 60}{100} + \frac{150 \times 70}{100}$
= 50 + 78 + 105 = 233
Total maximum marks = 100 + 130 + 150
= 380
Then , Total aggregate %
$= \frac{233}{380} \times 100 = 61.32\%$

Sol.205.(d) Increase in the population
= 2,22,600 - 1,85,500 = 37100
Average population increasing per year
$= \frac{37100}{10} = 3710$
Percentage population increase per year
$= \frac{3710}{185500} \times 100 = 2\%$

Sol.206.(b)
Ravi's salary = $1{,}600 \times \frac{120}{100}$ = 1,920

Sol.207.(a)
Let the salaries of A and B are a and b
5% of a = 20% of b
a : b = 4 : 1
Salary of A = $\frac{4}{5} \times 4300$ = 3440 Rs.

Sol.208.(b) Percentage of girls in the class = $\frac{13}{25} \times 100 = 52\%$

Sol.209.(d)
If we reduce radius of circle by 15%
Decrease in its area = $-15 - 15 + \frac{15 \times 15}{100}$
= - 30 + 2.25 = 27.75%

Sol.210.(d) According to Question ,
82 % = 738
90% = $\frac{738 \times 90}{82}$ = 810

Sol.211.(c) Given , CP = 55 , SP = 57.20 , Profit = 2.20
Profit % = $\frac{2.20}{55} \times 100 = 4\%$

Sol.212.(b) Let income of B = 100
So, income of A = 100 - 60= 40
B's income is more than by A
$= \frac{60}{40} \times 100 = 150\%$

Sol.213.(b) Let C = 100
B = 100 - 20 = 80
A = 80 + 30% of 80 = 80 + 24 = 104
A : C = 104 : 100 = 26 : 25

Sol.214.(b) Let the salary of Hema = 100
Donation to trust = 15% = 15
New donation = 125% of 15 = $\frac{5}{4} \times 15 = \frac{75}{4}$
A/Q ,
$\frac{75}{4}$ unit = Rs 4500
Salary = 100 unit = $\frac{4500 \times 4}{75} \times 100$
$= Rs\ 24000$

Sol.215.(c) Total deduction
= - 10 - 20 + $\frac{20 \times 10}{100}$ = - 30 + 2 = - 28%
Sum left = 100 - 28 = 72
A/Q,
72% = 3600
100% = $\frac{3600}{72} \times 100 = Rs\ 5000$

Sol.216.(a) 20% of 75 = 225 - x% of 420
$\Rightarrow \frac{20}{100} \times 75 = 225 - \frac{x}{100} \times 420$
$\Rightarrow 15 = 225 - \frac{21x}{5}$
$\Rightarrow \frac{21x}{5} = 225 - 15 = 210$
$\Rightarrow x = \frac{210 \times 5}{21} = 50$

Sol.217.(d) percentage of $\frac{3}{11}$ is $\frac{1}{121}$
$= 3\frac{1}{33}\%$

Sol.218.(a)
If x% of y is 2000 $\Rightarrow xy = 200000$ and y% of z is 4000 $\Rightarrow yz = 400000$;
Then the relation between x and z is :
$\Rightarrow \frac{yz}{xy} = 2 \Rightarrow z = 2x$;

Sol.219.(d)
Let the two numbers are a and b
According to the question :
$\frac{3}{10}a + b = \frac{7}{5}b \Rightarrow a : b = 4 : 3$

Sol.220.(d)
The ratio of shares = 30 : 45 : 25
= 6 : 9 : 5
Total = 20 unit
A/Q,
20 unit = 2,50,000
1st part = 6 unit = $\frac{250000}{20}$ × 6 = 75,000
2nd part = 9 unit = $\frac{250000}{20}$ × 9
= 1,12,500
3rd part = 5 unit = $\frac{250000}{20}$ × 5 = 62,500

Sol.221.(c)
Let the total number of students = 100
Students passed = 90
Failed students = 100 - 90 = 10
A/Q,
10 unit = 600
100 unit = $\frac{600}{10} \times 100 = 6000$

Sol.222.(d) A/Q,
44% = 798.6
63% = $\frac{798.6}{44} \times 63 = 1143.45$

Sol.223.(d) Let income of Y = 100
Income of X = 60
Y's income is more than X by 40
So , % = $\frac{40}{60} \times 100 = 66.67\%$

Sol.224.(c)
overall percentage reduction in the salary
= + 15 - 15 - $\frac{15 \times 15}{100}$ = - 2.25 %

Sol.225.(a) $\frac{2}{5}$ is convert to %
$\frac{2}{5} \times 100$ = 40%

Sol.226.(a) Mohan secured 72 % marks in Physics and 68% in chemistry;
Let the Maximum mark in each subject is 100 marks.
Then the percentage of marks that Mohan got in both subjects together is :
= $\frac{(72 + 68)}{200} \times 100$ = 70 %

Sol.227.(a) a = $\frac{7.5}{100}b \Rightarrow \frac{a}{b} = \frac{3}{40}$
b = $\frac{1.50}{100}c \Rightarrow \frac{b}{c} = \frac{6}{400} = \frac{3}{200}$
d = $\frac{5}{100}c \Rightarrow \frac{c}{d} = \frac{20}{1}$
$\Rightarrow \frac{a}{b} \times \frac{b}{c} \times \frac{c}{d} = \frac{3}{40} \times \frac{3}{200} \times \frac{20}{1}$
$\Rightarrow \frac{a}{d} = \frac{9}{400}$

Sol.228.(b)
Students passed in English = 80%
Students Passed in Mathematics = 85%
Passed in both = 75 %
Failed in both = (80 + 85) - 75% = 10%
A/Q,
10% = 40 students
100% = 400 students

Sol.229.(d) Let the total number of employees in the firm = 100
Number of male employees = 70

Number of female employees = 30
30% of male employees opt for voluntary retirement = $\frac{30}{100} \times 70 = 21$
20% of female employees opt for voluntary retirement
= $\frac{20}{100} \times 30 = 6$
Now, total number of male and female employees continue in service
= (70 - 21) + (30 - 6) = 49 + 24 = 73 %

Sol.230.(c)
Present population of the town = 185220
The population of the town before 3 years → $185220 \times \frac{100}{105} \times \frac{100}{105} \times \frac{100}{105}$
$176400 \times \frac{100}{105} \times \frac{100}{105}$
$168000 \times \frac{100}{105}$ = 1,60,000

Sol.231.(d) Let S get x marks.
A/Q , $S \times \frac{80}{100} \times \frac{125}{100} \times \frac{90}{100} = 360$
$\Rightarrow S = \frac{360 \times 10 \times 4 \times 5}{4 \times 5 \times 9}$
$\Rightarrow S = 400$
So, S gets = $\frac{400}{500} \times 100 = 80\%$

Sol.232.(a) $(\frac{25}{8})$% of 128 = x
$\Rightarrow \frac{25}{800} \times 128 = x$
$\Rightarrow \frac{128}{32} = x \Rightarrow x = 4$

Sol.233.(c) Given, person who read newspaper A = n(A) = 50%
person who read newspaper B = n(B) = 40%
person who read either newspaper A or B = n(A∪B) = 100% - 20% = 80%
So person who read both A and B newspaper = n(A∩B)
So n(A∩B) = n(A) + n(B) - n(A∪B)
n(A∩B) = 50% + 40% - 80% = 10%
Given, 10% = 500
So 100% = 5000
So a total of 5000 persons were surveyed.

Sol.234.(b) Percentage error
= $\frac{correct\ number - misread\ number}{correct\ number} \times 100$
→ $\frac{42-24}{42} \times 100 = \frac{3}{7} \times 100 = 42.86\%$

Sol.235.(d) Let the length of the rectangle be 2m and breadth be 5m .
According to question ,
Initial area → l × b = 2 × 5 = 10 m^2
Now , length is halved and breadth is tripled.
Final area → 1 × 15 = 15 m^2
Required Increased % area
→ $\frac{15-10}{10} \times 100 = 50\%$

Sol.236.(c) $\frac{1}{8} \times 100 = 12.5\%$

Sol.237.(a) $\frac{5}{8} = \frac{x}{100} \Rightarrow x = 62.5\%$

Sol.238.(a) Let the salaries of Anand and Nirmal are 900 unit and 400 units
Increased salary of Anand
= $900 \times \frac{115}{100}$ = 1035 units
According to the question,
1035 units = 5175 Rs.
Then , salary of Nirmal (400 units)
→ $\frac{5175}{1035} \times 400$ = 2000 Rs.

Sol.239.(a) Bala : Arun : chandru
Ratio of income
2 : 3 x (5)
5 x(3) : 6

Ratio of final income 10 : 15 : 18
43 unit = 86000 Rs. 1 unit = 2000 Rs.
Income of chandru = 18 × 2000
= 36000Rs.

Sol.240.(b) 5% of A + 4% of B
= $\frac{2}{3}$ (6% of A + 8% of B)
$\frac{1}{20} \times A + \frac{1}{25} \times B$
$= \frac{2}{3}(\frac{3}{50} \times A + \frac{2}{25} \times B)$
$\frac{A}{20} + \frac{B}{25} = \frac{2}{3}(\frac{3A}{50} + \frac{2B}{25})$
$\frac{5A+4B}{100} = \frac{2}{3}\left(\frac{3A+4B}{50}\right)$
$(15A + 12B) = (12A + 16B)$
3A = 4B $A : B = 4 : 3$

Sol.241.(c) $6500 \times \frac{95}{100} = 6175$
Then including to sale tax the
Bill was $6175 \times \frac{104}{100}$ = Rs. 6422

Sol.242.(c) S.P. = $\frac{1400 \times 85}{100}$ = 1190Rs.

Sol.243.(b)
Initial Final Consumption
12 : 15
%increase = $\frac{3}{12} \times 100 = 25\%$

Sol.244.(b) $\frac{140}{70} \times 100 = 200$

Sol.245.(b) Required Percentage
= $\frac{3\%}{5\%} \times 100 = 60\%$

Sol.246.(c) Let , the number of boys and girls are 300 and 200 respectively .
scholarship holder boys = $\frac{300 \times 20}{100} = 60$
scholarship holder girls = $\frac{200 \times 25}{100} = 50$
% of student do not get scholarship
= $\frac{500-(60+50)}{500} \times 100 = 78\%$

Sol.247.(a) Price $\propto \frac{1}{consumption}$
Ratio of price → 25 : 30
Ratio of consumption → 30 : 25
%reduction = $\frac{30-25}{30} \times 100 = 16\frac{2}{3}\%$

Sol.248.(c) Let , the number be x ,
(52-24)% of x = 112
28% of x = 112 → x = $\frac{112}{28} \times 100 = 400$
Now, 12.5% of x = $\frac{400 \times 12.5}{100} = 50$

Sol.249.(a) Ratio → initial : final
Price → 5 : 4
Cycle → 5 : 6

Sale → 25 : 24
Effect on sales = $\frac{25-24}{25} \times 100$
⇒ 4%decrease

Sol.250.(c) According to question ,
$(80 - 66\frac{2}{3})$% = 2 liters
$\Rightarrow \frac{40}{3}$% = 2 litres
Total capacity (100%) = $\frac{6}{40} \times 100$
= 15 litres

Sol.251.(d) 25% of a = b $\Rightarrow \frac{a}{4} = b$
Now, b% of 160 = $\frac{a}{4}\%\ of\ 160$
B% of 160 = 40% of a

Sol.252.(a) 10% of 1000% of 100
= $100 \times \frac{1000}{100} \times \frac{10}{100} \Rightarrow 100$

Sol.253.(c) Let the no. be x , then
$x + 36 = x \times \frac{109}{100}$
$9x = 3600 \rightarrow x = 400$

Sol.254.(a) Let the third no. = 10
Then ,1st no. = 9 and 2nd no. = 8
Required % = $\frac{9-8}{8} \times 100 = 12.5\%$

Sol.255.(d) A Fruit seller sells 30% of the apples he has. Then , remaining apples (70%) of total = 630

Total no. of apples (100%)

$= \frac{100}{70} \times 630 \Rightarrow 90$

Sol.256.(b) Percentage increase

$= \frac{New\ value\ - previous\ value}{previous\ value} \times 100$

$= \frac{138-115}{115} \times 100 = \frac{23}{115} \times 100 = 20\%$

Sol.257.(b) Here , expenditure is same in both cases .

Then, price is inversely proportional to consumption.

Expenditure = Price × Consumption

Initial : final

Price increased ⇒ 456 : 570 or 4 : 5

Consumption ⇒ 5 : 4

Reduction % = $\frac{5-4}{5} \times 100 = 20\%$

Sol.258.(a) Remaining %

$= \frac{initial\ value\ - final\ value}{initial\ value} \times 100$

$= \frac{60-36}{60} \times 100 = \frac{24}{60} \times 100 = 40\%$

Sol.259.(a) Total number of candidates appeared in examination = 500

42% ⇒ got 81 - 100 percentile

25% ⇒ got 61 - 80 percentile

And remaining who got 41-60 percentile

= 100% - (42% + 25%)

= 33%

Now, 33% = $500 \times \frac{33}{100} = 165$

Sol.260.(c) Remaining %

$= \frac{25-16}{25} \times 100$

$= \frac{9}{25} \times 100 = 36\%$

Sol.261.(a) Percentage increase

$= \frac{New\ value\ - previous\ value}{previous\ value} \times 100$

$= \frac{28-25}{25} \times 100 = \frac{3}{25} \times 100 = 12\%$

Sol.262.(c) Fractional values are:

25 % = $\frac{1}{4}$, 66.67% = $\frac{2}{3}$,

75% = $\frac{3}{4}$ and 80% = $\frac{4}{5}$

Let, the number = x

According to question

$x \times \frac{1}{4} \times \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} = 5213$

$x = \frac{5213 \times 4 \times 3 \times 4 \times 5}{2 \times 3 \times 4} = 52130$

40% of $x = \frac{52130 \times 40}{100} = 20852$

Sol.263.(a)

Percentage increase =

$\frac{New\ value\ - previous\ value}{previous\ value} \times 100 = \frac{174-145}{145} \times 100 = \frac{29}{145} \times 100 = 20\%$

Sol.264.(a) Here , expenditure is same in both cases .

Then, price is inversely proportional to consumption.

Expenditure = Price × Consumption

Initial : final

Price ⇒ 480 : 600 or 4 : 5

Consumption ⇒ 5 : 4

Reduction % = $\frac{5-4}{5} \times 100 = 20\%$

Sol.265.(a) Percentage increase =

$\frac{New\ value\ - previous\ value}{previous\ value} \times 100$

$= \frac{156-130}{130} \times 100 = \frac{26}{130} \times 100 = 20\%$

Sol.266.(d) Fractional value of ,

25 % = $\frac{1}{4}$, 66.67% = $\frac{2}{3}$, 75% = $\frac{3}{4}$ and

80% = $\frac{4}{5}$

Let, the no. be x

Then , according to question

$x \times \frac{1}{4} \times \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} = 4915$

$x = \frac{4915 \times 4 \times 3 \times 4 \times 5}{2 \times 3 \times 4} = 49150$

40% of x = $\frac{49150 \times 40}{100} = 19660$

$x = \frac{4915 \times 4 \times 3 \times 4 \times 5}{2 \times 3 \times 4} = 49150$

Sol.267.(c) Here , expenditure is same in both cases .

Then, price is inversely proportional to consumption.

Expenditure = Price × Consumption

Initial : final

Price increased ⇒ 468 : 585 or 4 : 5

Consumption ⇒ 5 : 4

Reduction % = $\frac{5-4}{5} \times 100 = 20\%$

Sol.268.(a) Remaining %

$= \frac{initial\ value\ - final\ value}{initial\ value} \times 100$

$= \frac{70-28}{70} \times 100 = \frac{42}{70} \times 100 = 60\%$

Sol.269.(a) Percentage increase

$= \frac{New\ value\ - previous\ value}{previous\ value} \times 100$

$= \frac{40-36}{36} \times 100 = \frac{4}{36} \times 100 = 11.11\%$

Sol.270.(a) Profit %

$= \frac{selling\ price\ - cost\ price}{cost\ price} \times 100$

$= \frac{942-785}{785} \times 100 = 20\%$

Sol.271.(b) Fractional value of ,

25 % = $\frac{1}{4}$, 66.67% = $\frac{2}{3}$, 75% = $\frac{3}{4}$ and

80% = $\frac{4}{5}$

Let, the no. be x

Then , according to question

$x \times \frac{1}{4} \times \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} = 512$

x = $\frac{512 \times 4 \times 3 \times 4 \times 5}{2 \times 3 \times 4} = 5120$

40% of x = $\frac{5120 \times 40}{100} = 2048$

Sol.272.(d) Total number of candidates appeared in examination = 650

47% ⇒ got(81 - 100) percentile

23% ⇒ got 61 - 80 percentile

And remaining who got (41-60) percentile = 100% - (47% + 23%) = 30%

Now, 30% of 650

⇒ $650 \times \frac{30}{100} = 195$

Sol.273.(c) Given that 11% product got damaged , Then Safe item will be 89%

Now, The value 89% = 2047 ⇒ 1% = 23

⇒ the value of damaged product (11%) = 253

Sol.274.(c) Total spend

= 14% + 16% +12% + 13% = 55%

Remaining salary = Total salary - total spend = 100% - 55% = 45%

Now, 45% = 24570 ⇒ 1% = 546

then , 12 % = 546 × 12 = 6552 Rs.

Sol.275.(a) Given that 11% product got damaged , Then Safe item will be 89%

Now, The value 89% = 4984 ⇒ 1% = 56

⇒ the value of damaged product (11%) = 616

Sol.276.(c) Area of Rectangle = L × B

Length is increase by 4% and Breadth is decrease by 4%

Then , change in area = (4 - 4 - $\frac{4 \times 4}{100}$)%

= - 0.16%

- sign indicates decrease

Sol.277.(b)

Average mark obtained by Terlin

$= \frac{mark\ obtained\ in\ all\ subjects}{sum\ of\ maximum\ mark\ in\ all\ subjects}$

$\Rightarrow \frac{65+75+45+25}{300} \times 100 = \frac{210}{3}\% = 70\%$

Sol.278.(c) Given that 11% product got damaged , then, safe products = 89%

Now, the value of 89% = 5785 ⇒ 1% = 65

⇒ the number of damaged products (11%)

= 715

Sol.279.(d) Average mark obtained by Vimal

$= \frac{mark\ obtained\ in\ all\ subjects}{sum\ of\ maximum\ mark\ in\ all\ subjects}$

$\Rightarrow \frac{72+91+63+44}{300} \times 100 = \frac{270}{3}\% = 90\%$

Sol.280.(a) Let the C.P. of article be 100 , then M.P. of the article be 137

Now, S.P. = $\frac{137 \times 63}{100}$ = 86.31

Loss = 100 - 86.31 = 13.69%

Short Tricks :-

If markup (m%) and discount (d%) is same , Then Profit / Loss % = $\frac{m \times d}{100}$

$\Rightarrow \frac{(+37\%)(-37\%)}{100}$ = - 13.69%

Here (-) indicate Loss

Sol.281.(a) Let the no be x

ATQ,

28% of x = 35 $\Rightarrow \frac{28x}{100}$ = 35

x = $\frac{35 \times 100}{28}$ = 125

Sol.282.(c)

Let the monthly income of Veer be x

ATQ,

$x \times \frac{17}{20} \times \frac{2}{5} = 2210 \Rightarrow x \times \frac{17}{50} = 2210$

x = $\frac{2210 \times 50}{17}$ = ₹6500

Sol.283.(d)

Balancing the given ratio, we have :

A	:	B	:	C
1	:	2	:	2
1	:	1	:	5
1	:	2	:	10

The share of B = $\frac{2}{1+2+10} \times 1560$

= $\frac{2}{13} \times 1560$ = ₹240

Sol.284.(b) 54% of 4000

= $\frac{4000 \times 54}{100}$ = 2160

Sol.285.(a) Let the number be = x

30% of x = 33

$\frac{30x}{100}$ = 33 $\Rightarrow$ x = $\frac{33 \times 100}{30}$ = 110

Sol.286.(d)

Let the maximum marks be 100%

Here, 78% $\rightarrow$ 663

Then, 100% $\rightarrow \frac{663}{78} \times 100$ = 850

Sol.287.(c)

Let the salary of Tanya be 100%

ATQ, 115% $\rightarrow$ ₹14,030

Then, 100% $\rightarrow \frac{14,030}{115} \times 100$ = ₹12,200

Sol.288.(d) Let the smaller and bigger no be x and (x + 4)respectively

ATQ,

$\Rightarrow$ 15% of x + 30% of (x + 4)

= 24% of (2x + 4)

$\Rightarrow$15x + 30x + 120 = 48x + 96

$\Rightarrow$ 45x + 24 = 48x

$\Rightarrow$ 48x - 45x = 24 $\Rightarrow$ 3x = 24 x = 8

So, the smaller no = 8 and bigger no = 8 + 4 = 12

Sol.289.(a) Required pass marks

= 40 × $\frac{34}{100}$ = $\frac{1360}{100}$ = 13.6

Sol.290.(b) Let the total marks be 100x

ATQ,

100x × 84% = 63

84x = 63 $\Rightarrow$ x = $\frac{63}{84} = \frac{3}{4}$

So, the total marks in a test = 100x

= 100 × $\frac{3}{4}$ = 75

Sol.291.(d) As we know,price $\propto \frac{1}{consumption}$ (when expenditure is constant)

	Initial	:	Final
Price of sugar $\rightarrow$	10	:	13
Consumption of sugar $\rightarrow$	13	:	10

Required percentage

= $\frac{13-10}{13} \times 100 = \frac{300}{13} = 23\frac{1}{13}\%$

Sol.292.(b)

Cost of an electric bulb after 1 year

= 4200 × $\frac{92}{100}$ = ₹3864

Sol.293.(b) Let the maximum marks in a test be 100x

ATQ,

72x = 54

x = $\frac{54}{72} = \frac{3}{4}$

So, the maximum marks in a test

= 100x = $\frac{3}{4} \times 100$ = 75

Sol.294.(c) Let the monthly salary of Akash be 100% Then, savings of Akash

= 9600 × $\frac{40}{100}$ = ₹3,840

Sol.295.(b) Percentage of marks in Hindi

= $\frac{68}{80} \times 100$ = 85%

Percentage of marks in Mathematics

= $\frac{46}{60} \times 100$ = 76.6%

Percentage of marks in Science

= $\frac{74}{90} \times 100$ = 82.2%

Percentage of marks in English

= $\frac{34}{45} \times 100$ = 75.5%

Clearly, we can see that Anju scored the maximum percentage marks in Hindi.

Sol.296.(c) Percentage of children who like Mathematics = 60%

Percentage of children who like Science = 45%

Percentage of children who like both Maths and Science = 25%

Percentage of children who like at least one subject = (60 + 45 - 25) = 80%

Sol.297.(b) There are 60 minutes in an hour. There are 24 hours in a day. So, required percentage

= $\frac{18}{24 \times 60} \times 100 = 1.25\%$

Profit and Loss

1. Profit incurs when SP (selling price) is more than CP (cost price).

2. Profit = SP – CP

3. Loss incurs when CP is more than SP i.e. Loss = CP – SP

4. % Profit = $\frac{Profit}{CP} \times 100$

5. % Loss = $\frac{loss}{CP} \times 100$

6. Profit or Loss is always calculated on cost price.

7. $SP = CP \times \frac{100 \pm profit/loss}{100}$

8. $CP = SP \times \frac{100}{100 \pm profit/loss}$

Note: In case of profit you must add and in case of loss subtract in above two formulas.

9. When instead of amount, number of goods sold are given then,

Percentage profit

$= \frac{Remaining\ Goods}{Goods\ sold} \times 100$

10. When two products are sold at same selling price, one at a loss of x% and other at a profit of x% then net result is always loss, which is equal to :

Net result = $\left(\frac{x^2}{100}\right)$%

11. When two products are sold at same selling price, one at a loss/profit of x% and other at a loss/profit of y% then net result is equal to :

Net result = $\left\{\frac{100(x+y)+2xy}{200+x+y}\right\}$%

Note :- Take +ve sign → Profit and -ve sign → Loss

12. Marked Price - Discount = Selling Price

13. Discount is always calculated on Marked price. So, Discount %

$= \frac{Discount}{Marked\ price} \times 100$

14. In case of Trade Discount and Cash Discount, first deduct the Trade Discount and then calculate the Cash Discount on the remaining amount.

15. If a trader profess to sell goods at cost price but uses false weights, then

Profit percentage

$= \frac{Error}{True\ value - Error} \times 100,$

where Error = True value - False value

16. $\frac{CP}{MP} = \frac{100 - Discount\ \%}{100 + Profit\ \%}$

Variety Questions

Q.1. The percentage profit earned by James by selling an article for ₹ 1,920 is equal to the percentage loss incurred by selling the same article for ₹ 1,500. At what selling price should he sell the article if he wants to make a profit of 10%?
Group D 17/08/2022 (Afternoon)
(a) ₹4,000 (b) ₹7,000
(c) ₹1,881 (d) ₹2,000

Q.2. A vendor sold 25 laptops at a profit of 12% and 15 laptops at a profit of 20%. If he had sold all the 40 laptops at a profit of 18%, his profit would have increased by ₹30,000. What is the cost price of each laptop, if the cost price of all the 40 laptops is the same?
Group D 18/08/2022 (Afternoon)
(a) ₹28,000 (b) ₹26,000
(c) ₹25,000 (d) ₹27,000

Q.3. A dishonest shopkeeper claims to sell rice at the cost price of ₹95 per kg, but the weight he uses has 1 kg written on it, while it actually weighs 950 gms. The profit he thus earns on selling rice having an actual weight of 100 kg rice is:
Group D 29/08/2022 (Morning)
(a) ₹500 (b) ₹275 (c) ₹475 (d) ₹375

Q.4. A dishonest shopkeeper pretends to sell his goods at cost price, but uses a false weight on which 984 gm is written but which actually weighs much less. Using this false weight the shopkeeper actually makes a gain of 23%. Find the actual measure of the weight (in gm) used.
Group D 30/08/2022 (Morning)
(a) 900 (b) 800 (c) 850 (d) 935

Q.5. A retailer permits a trade discount of 25% followed by a cash discount of 8% on the already discounted price of his goods, and still makes a net gain of 17.3% of the cost price. At what percentage above the cost price of the goods is the marked price fixed?
Group D 02/09/2022 (Morning)
(a) 50% (b) 60% (c) 75% (d) 70%

Q.6. An article is sold at a profit of 28%. If the cost price is increased by ₹50 and the selling price is reduced by ₹18, then the profit would be 11.6%. What is the original cost price (in ₹) of the article?
Group D 08/09/2022 (Morning)
(a) 480 (b) 350 (c) 400 (d) 450

Q.7. If a discount of 10% is given on the marked price of a book, the bookseller gains 20%. If the discount is increased to 12.5%, then what is the gain percent of the bookseller?
Group D 08/09/2022 (Afternoon)
(a) $17\frac{2}{3}$% (b) $18\frac{2}{3}$%
(c) $16\frac{2}{3}$% (d) $15\frac{2}{3}$%

Q.8. The marked price of an article is ₹100. If the article is sold at a discount of 25%, then 25% profit is realised. The percentage loss or percentage profit made (approximately) if it is sold for ₹20 less than the marked price is:
Group D 08/09/2022 (Evening)
(a) 35% loss (b) 25% profit
(c) $12\frac{1}{2}$% loss (d) $33\frac{1}{3}$% profit

Q.9. Aman purchased two varieties of apples at the rate of ₹2 for 3 apples and ₹1 per apple, respectively. If he purchased an equal number of apples of each variety and then sold all his apples at ₹1 per apple, what was his profit percentage?
Group D 18/09/2022 (Evening)
(a) 22% (b) 20% (c) 15% (d) 18%

Q.10. A man purchased 50 dozen bananas for a certain amount. He could not sell five dozen of those bananas as they were spoiled. He sold two-thirds of the good bananas at a profit of 20% per dozen and sold the remaining good bananas at a profit of 5% per dozen. What was his loss or gain percentage in the whole transaction?
Group D 18/09/2022 (Evening)
(a) 3.5% gain (b) 3.5% loss
(c) 2.5% loss (d) 2.5% gain

Q.11. A sells an article to B at a gain of 16%. B sells it to C at a loss of 15% and C sells it to D at a gain of 20%. If the difference between the profits earned by C and A is ₹248, then the loss (in₹) incurred by B is:
Group D 26/09/2022 (Afternoon)
(a) 1,040 (b) 1,160 (c) 1,200 (d) 1,150

Q.12. On selling an article X at a loss of 10% and an article Y at a gain of 15%, a man gains ₹7. If he had sold article X at a gain of 12% and article Y at a gain of 5%, he would have gained ₹10. What is the total original cost price (in ₹) of X and Y?
Group D 28/09/2022 (Morning)
(a) 125 (b) 120 (c) 140 (d) 130

Q.13. If a dishonest shopkeeper claims to sell rice at cost price but uses a faulty weight and thus gains 14%, then find the weight he actually gives per kilogram of

rice for which a customer pays. (Round the answer to the nearest whole number.)
Group D 29/09/2022 (Morning)
(a) 857 gm (b) 877 gm
(c) 867 gm (d) 887 gm

Q.14. A shopkeeper finds that when he sells one kind of rice at 50 per kg he loses 20% and when he sells another kind of rice at 72 per kg he gains 20%. If he mixes them in the ratio 3:2 and sells the mixture at 64 per kg, then what is his overall gain percentage (correct to one decimal place)?
Group D 06/10/2022 (Morning)
(a) 5.4% (b) 4.1% (c) 4.5% (d) 5.6%

Q.15. A dealer sells an article at ₹403.20, after offering a discount of 16% on its marked price. Had he not offered any discount, he would have earned a profit of 28% on the cost price of the article. What is the cost price (in ₹) of the article ?
NTPC CBT II Level 6 (09/05/2022) Shift 2
(a) 350 (b) 480 (c) 375 (d) 400

Q.16. Hrithik sold a table at a profit of 37.5%. Had he bought it at 12.5% less, and sold it at Rs 330 less, he would have made a profit of 10%. By what percent is the cost price of the table less than ₹ 1,000 ?
NTPC CBT II Level 3 (17/06/2022) Shift 3
(a) 22% (b) 20% (c) 23% (d) 21%

Q.17. Lovely calculates his profit percentages on selling price, whereas Bunty calculates his on the cost price. They find that the difference in their profit is Rs. 100. If their selling price is the same, and both of them get a profit of 25%, then what is the selling price?
NTPC CBT - I 27/01/2021 (Evening)
(a) Rs. 4000 (b) Rs. 3000
(c) Rs. 2500 (d) Rs. 2000

Q.18. A shopkeeper cheats to the extent of 10% while buying as well as while selling. While he was eventually caught and punished, at what percent was the gaining till then?
NTPC CBT - I 09/02/2021 (Morning)
(a) 21% (b) 34% (c) $21\frac{1}{2}$% (d) 20%

Q.19. After offering successive discounts of 15% and 12%, there was still a 10% profit on the sale of the item. What is the ratio of the marked price to the cost price of the item?
NTPC CBT - I 17/02/2021 (Evening)
(a) 2 : 1 (b) 25 : 17
(c) 90 : 73 (d) 110 : 73

Q.20. Anisha purchased a TV at $\frac{4}{5}$th of its initial selling price and then sold it at 4% more than its initial selling price. What is Anisha's gain percentage?
NTPC CBT - I 01/03/2021 (Morning)
(a) 30% (b) 10% (c) 40% (d) 20%

Q.21. On selling a chair at 5% loss and a table at 15% gain, a man gains Rs. 300. If he sells the chair at 5% gain and the table at 5% gain, then he gains Rs. 180. The actual cost of the table is.
NTPC CBT - I 14/03/2021 (Evening)
(a) Rs. 1600 (b) Rs. 2400
(c) Rs. 2200 (d) Rs. 1800

Q.22. $\frac{1}{3}$of a commodity is sold at the rate of 15% profit, $\frac{1}{4}$ is sold at the rate of 20% profit and the rest is sold at the rate of 24% profit. If a total profit of Rs. 62 is earned, then find the cost price of the commodity.
NTPC CBT - I 27/03/2021 (Morning)
(a) Rs. 310 (b) Rs. 325
(c) Rs. 300 (d) Rs. 320

Q.23. The ratio of the marked price to the cost price of an article is 5:3. If the selling price of that article is Rs. 3645 and the shopkeeper gave two successive discounts of 25% and 10% on the marked price, then what is the profit or loss percent during this transaction?
NTPC CBT - I 08/04/2021 (Evening)
(a) loss 15% (b) loss 15.5%
(c) profit 10% (d) profit 12.5%

Q.24. A milkman mixes 10% water in pure milk but he is not content with it. So, he again mixes 10% more water in the previous mixture. What is the profit percentage of milk if he sells it at cost price?
NTPC CBT - I 23/07/2021 (Evening)
(a) 12.1% (b) 11.11% (c) 21% (d) 20%

Q.25. Two varieties of tomatoes are bought in the ratio 2 : 3, where the price of first variety is twice that of the second. The varieties are mixed and sold at Rs.17.50 per kg, resulting in a profit of 25%. Find the costs of the two varieties before selling.
RRB JE 02/06/2019 (Afternoon)
(a) Rs.24, Rs.12 (b) Rs.12, Rs.6
(c) Rs.22, Rs. 11 (d) Rs.20, Rs.10

Q.26. If the selling price is Rs. 1680 there is a loss of 16%, what should be the marked price on this product, if after allowing a discount of 8% there is a profit of 15% ?
RRB JE 28/06/2019 (Evening)
(a) Rs.2000 (b) Rs.2500
(c) Rs.2600 (d) Rs.2200

Q.27. A trader buys 60 bags of grain at the rate of ₹ 400 each. If it sells 18 bags at 8% profit, at what price should it sell the remaining bags to make a total profit of 16.4% on 60 bags?
ALP Tier - 2 23/01/2019 (Morning)
(a) ₹500 (b) ₹480 (c) ₹540 (d) ₹520

Q.28. If the selling price doubles, then the profit on it becomes four times. Calculate profit.
ALP Tier II 08/02/2019 (Morning)
(a) 50 % (b) 200 % (c) 100% (d) 40 %

Q.29. Yaman sold an item at a loss of 10%. If he had sold it for ₹ 57 more, he would have made a profit of 20%. What should be the selling price of the item to make a profit of 30%?
RRB ALP Tier - I 20/08/2018 (Evening)
(a) ₹247 (b) ₹222.30 (c) ₹228 (d) ₹190

Q.30. A shopkeeper sells two items at a rate of Rs.891 each. On one object did benefit 10 percent and on the other it did a loss of 10% . Find the percentage of overall profit or loss.
RPF Constable 19/01/2019 (Morning)
(a) 4% profit (b) 1% Loss
(c) 1% profit (d) 4% Loss

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.31. If the cost price of an article is ₹2,500 and its selling price is ₹2,375, then the loss percentage is:
Group D 17/08/2022 (Morning)
(a) 3% (b) 5% (c) 4% (d) 6%

Q.32. Venkat bought a second-hand scooter and spent 10% of the cost on its repairs. He sold the scooter for a profit of 2,200. How much did he spend on repairs if he made a profit of 20%?
Group D 17/08/2022 (Evening)
(a) Rs. 1,200 (b) Rs. 750
(c) Rs. 1,000 (d) Rs. 400

Q.33. A shopkeeper sold a book at a loss of 14%. If the selling price had been increased by ₹ 100, there would have been a gain of 6%. What was the cost price(in Rs.) of the book?
Group D 17/08/2022 (Evening)
(a) ₹ 650 (b) ₹ 500
(c) ₹ 970 (d) ₹ 450

Q.34. A television costs Rs.35,000 less than a printer. If the cost of the printer is twice the cost of the television, then the cost of the television is:
Group D 18/08/2022 (Morning)
(a) Rs.53,000 (b) Rs.15,700
(c) Rs.17,500 (d) Rs.35,000

Q.35. A man buys 15 identical articles for a total of ₹15. If he sells each of them for ₹1.23, then his profit percentage is:
Group D 18/08/2022 (Afternoon)
(a) 23% (b) 32% (c) 50% (d) 8%

Q.36. A shopkeeper sells an item at a profit of 25% and dishonestly uses a weight that is 30% less than the actual weight. Find his total profit.
Group D 18/08/2022 (Evening)
(a) 65.75% (b) 78.57% (c) 23% (d) 42%

Q.37. A blanket is sold for Rs.1,148, which results in a loss of 30%. For how much should it be sold to gain 5%?
Group D 22/08/2022 (Morning)
(a) ₹1,734 (b) ₹1,543
(c) ₹1,423 (d) ₹1,722

Q.38. The price of an article is increased by 20% and then two successive discounts of 5% each are allowed. The selling price of the article is _____ above its cost price.
Group D 22/08/2022 (Morning)
(a) 6.9% (b) 7.8% (c) 9.2% (d) 8.3%

Q.39. By selling an item at a 10% profit a seller makes a profit of ₹777.70. Find the cost price of the item.
Group D 22/08/2022 (Afternoon)
(a) ₹ 7,707 (b) ₹7,777
(c) ₹7,277 (d) ₹7,177

Q.40. A shopkeeper bought 12 dozen eggs at the rate of ₹5 per egg. 12 eggs broke in transit. He sold the remaining eggs at the rate of ₹6 per egg. Find his percentage of profit.
Group D 22/08/2022 (Evening)
(a)15% (b)10% (c) 3.5% (d) 20%

Q.41. If A bought an item for ₹384 and sold it for ₹576 and B bought another item for ₹1,254 and sold it for ₹1,672. What is the ratio of gain % of A to gain % of B?
Group D 23/08/2022 (Morning)
(a) $\frac{5}{2}$ (b) $\frac{5}{3}$ (c) $\frac{3}{2}$ (d) $\frac{3}{4}$

Q.42. A dealer allows 30% discount on the marked price of an item and still makes a profit of 10%. By how much percentage is the marked price more than the cost price (rounded off to two places of decimal)?
Group D 23/08/2022 (Morning)
(a) 57.14% (b) 26.67%
(c) 33.33% (d) 45.45%

Q.43. The cost incurred by Mahesh to produce an item in the factory was ₹2,000. He had to spend 10% of the production cost incurred on the item in the factory to transport it to the showroom at a price that was 15% above the total cost incurred by Mahesh in the production and transportation of the item. What was the price at which Mahesh sold the item from the showroom?
Group D 23/08/2022 (Morning)
(a) ₹2,300 (b) ₹2,530
(c) ₹2,500 (d) ₹2,250

Q.44. A trader marked the price of an article at $1\frac{2}{5}$ times of its cost price and he sold it $\frac{17}{20}$ of the marked price. What is his gain percentage on that article?
Group D 23/08/2022 (Afternoon)
(a) 23% (b) 20% (c) 17% (d) 19%

Q.45. A shopkeeper sells sugar by weighing 35 kg instead of 40 kg each by using the wrong weights. If he sells the sugar at the cost price, what is his percentage profit (rounded off to two decimal places)?
Group D 23/08/2022 (Evening)
(a) 17.66% (b) 12.50%
(c) 15.33% (d) 14.28%

Q.46. Chandrasekhar sold 12 identical articles for a total of ₹420, incurring a loss equal to the cost price of 7 such articles. The cost price of 1 such article is:
Group D 24/08/2022 (Morning)
(a) ₹84 (b) ₹48 (c) ₹60 (d) ₹35

Q.47. When the selling price of a TV is ₹18,700, the shopkeeper incurred a loss of 15%. What should be the selling price of that TV to gain 15%?
Group D 24/08/2022 (Morning)
(a) ₹25,300 (b) ₹34,200
(c) ₹43,200 (d) ₹19,800

Q.48. The cost price of an article is equal to 64% of the marked price. Find the profit percentage obtained after giving a discount of 4%.
Group D 24/08/2022 (Afternoon)
(a) 45% (b) 60% (c) 40% (d)50%

Q.49. Mr. Saxena buys some pens at the rate of ₹ 150 per dozen. He sells them at the rate of ₹15 each. Find their percentage profit/loss.
Group D 24/08/2022 (Afternoon)
(a) 20% profit (b) 28.6% loss
(c) 37.5% loss (d) 18.5% profit

Q.50. A fruit seller buys 800 apples for ₹ 4,800. He spends ₹800 on transportation. At what price should he sell each apple to make a profit of ₹10 on each apple?
Group D 24/08/2022 (Evening)
(a) ₹17 (b) ₹12 (c) ₹76 (d) ₹32

Q.51. A dealer sold three-fifths of his goods at a gain of 25% and the remaining at cost price. What is his loss or gain percent in the whole transaction?
Group D 24/08/2022 (Evening)
(a) 15% gain (b) 18% loss
(c) 18% gain (d) 15% loss

Q.52. A tradesman marked his goods at 26% above its cost price and then allowed a discount of 13%. His gain (in %) is:
Group D 25/08/2022 (Morning)
(a) 6.29 (b) 9.62 (c) 9.26 (d) 6.92

Q.53. A shopkeeper allows successive discount of 20% and 15% on an item of marked price ₹2,000. At what price did he sell the item?
Group D 25/08/2022 (Morning)
(a) ₹1,300 (b) ₹1,240
(c) ₹1,360 (d) ₹1,200

Q.54. If the selling price of an almirah is doubled, profit is tripled. Find the profit percentage.
Group D 25/08/2022 (Afternoon)
(a) 25% (b) 10% (c) 50% (d) 100%

Q.55. If a man bought 6 pencils for ₹5, and sold them at 5 pencils for ₹6, then the gain percentage is_____
Group D 25/08/2022 (Afternoon)
(a) 43% (b) 41% (c) 42% (d) 44%

Q.56. In certain store, the profit is 260% of the cost. If the selling price is ₹7,200, then the cost price is:
Group D 25/08/2022 (Evening)
(a) ₹2,420 (b) ₹2,000
(c) ₹3,000 (d) ₹2,200

Q.57. A shopkeeper offered successive discounts of 10% and 15% on an article having a marked price of ₹28,000. Find the selling price of the article.
Group D 25/08/2022 (Evening)
(a) ₹21,420 (b) ₹21,402
(c) ₹22,140 (d) ₹21,240

Q.58. The cost of two chairs and three tables is ₹1,450. If a chair costs ₹250 less than a table, then find the cost of

one table.
Group D 26/08/2022 (Morning)
(a) ₹390 (b) ₹440 (c) ₹320 (d) ₹350

Q.59. An article marked Rs 275 is sold at a discount of 5%. The seller still gets a profit of 4.5%. How much did he pay for it?
Group D 26/08/2022 (Afternoon)
(a) ₹250 (b) ₹225 (c) ₹125 (d) ₹200

Q.60. By what percent above the cost price should a shopkeeper mark his goods so that even after allowing a discount of 8% on the marked price, he may make a profit of 15%?
Group D 26/08/2022 (Afternoon)
(a) 25% (b) 40% (c) 30% (d) 27%

Q.61. A retailer gains 18% by selling an article at its marked price. If he gives a discount of 10% on the marked price, what will be his actual profit on the article?
Group D 26/08/2022 (Evening)
(a) 5.5% (b) 7.1% (c) 4.6% (d) 6.2%

Q.62. A dishonest dealer professes to sell his goods at cost price, but uses false weights, and thus gains 20%. For one kilogram, how many grams of watts does he use?
Group D 26/08/2022 (Evening)
(a) 750.5 gm (b) 708.06 gm
(c) 833.33 gm (d) 785.5 gm

Q.63. A man brought some fruits at 14 for ₹30 and sold them at 7 for ₹20. What is his profit percentage?
Group D 29/08/2022 (Morning)
(a) 30% (b) 36.33% (c) 20% (d) 33.33%

Q.64. Cost price of a toy is ₹210. What should be its MRP so that after a discount of 5% shopkeeper gains 90%.
Group D 29/08/2022 (Afternoon)
(a) ₹450 (b) ₹480 (c) ₹420 (d) ₹400

Q.65. Aditya bought a flat for ₹5,50,000. He spent ₹25,000 on its painting and repair. If he sold it for ₹5,37,625, then his loss percentage is:
Group D 29/08/2022 (Evening)
(a) 6.5% (b) 4.5% (c) 7.5% (d) 5.5%

Q.66. A shopkeeper uses a weight of 950 gm instead of 1 kg and sells the articles at the marked price, which is 15% above the cost price. What is his profit percentage?
Group D 30/08/2022 (Afternoon)
(a) $23\frac{7}{19}\%$ (b) $20\frac{5}{19}\%$
(c) $21\frac{1}{19}\%$ (d) $22\frac{3}{19}\%$

Q.67. The owner loses 20% when he sells a plot for ₹19,50,000. At what price must he sell the plot in order to gain a profit of 20 % ?
Group D 30/08/2022 (Evening)
(a) ₹22,50,000 (b) ₹21,00,000
(c) ₹29,25,000 (d) ₹25,95,000

Q.68. If the manufacturer gains 12%, the wholesale dealer gains 15% and the retailer gains 20%, then find the cost of production of a table, the retail price of which is ₹15,456.
Group D 01/09/2022 (Morning)
(a) ₹20,000 (b) ₹15,000
(c) ₹12,000 (d) ₹10,000

Q.69. An article is marked 50% above its cost price. If the shopkeeper gives two successive discounts of 10% and 25%, and still earns a profit of ₹15, then the cost price of the article is:
Group D 01/09/2022 (Afternoon)
(a) ₹ 1,600 (b) ₹ 1,750
(c) ₹ 1,200 (d) ₹ 1,500

Q.70. A dealer buys apples at ₹50, ₹40 and ₹30 per kilogram. He mixes them in the ratio 2 : 4 : 9 respectively, by weight, and sells at a profit of 30%. At what approximate price per kilogram does he sell the apples?
Group D 01/09/2022 (Evening)
(a) ₹75 (b) ₹45.9 (c) ₹10.8 (d) ₹23.5

Q.71. A man sold a shirt for ₹ 960, at a loss of 4%. He sells a sweater for ₹840 at a profit of 20%. Find his net profit or loss.
Group D 02/09/2022 (Afternoon)
(a) Profit, ₹100 (b) Loss, ₹123
(c) Loss, ₹100 (d) Profit, ₹123

Q.72. Harish bought an article for ₹520 and sold it to Renu at a loss of 30%. With this amount, Harish bought another article and sold it at a gain of 55%. What is Harish's overall gain percentage?
Group D 02/09/2022 (Afternoon)
(a) 9.5% (b) 8.5% (c) 7.8% (d) 9%

Q.73. By selling an article for ₹19.50, a man makes a profit of 30%. By how much should the sales price be increased to make a profit of 40%?
Group D 02/09/2022 (Evening)
(a) ₹ 1.50 (b) ₹ 2.00 (c) ₹ 4 (d) ₹ 1.90

Q.74. A shopkeeper professes to sell his goods at a 10% loss but uses a false balance and gains 15%. The actual weight (correct to one decimal place) he uses for 1 kg is:
Group D 02/09/2022 (Evening)
(a) 784.4 gm (b) 785.6 gm
(c) 782.6 gm (d) 788.4 gm

Q.75. A man loses 12% by selling an article for ₹330. If he sells it for ₹367.50, what will be his gain/loss percentage?
Group D 05/09/2022 (Afternoon)
(a) Gain, 2% (b) Loss, 4%
(c) Gain, 4% (d) Loss, 2%

Q.76. During a sale, $66\frac{2}{3}\%$ of the goods are sold at 26% profit, 25% of the remaining goods are sold at 20% profit, and then the remaining goods are sold at 40% loss. If the total profit is x%, then find the value of x.
Group D 06/09/2022 (Morning)
(a) 8.5 (b) 9.5 (c) 9 (d) 8

Q.77. A shopkeeper marks the list price of a fan 22% above its cost price, and offers a discount of 15% on its marked price. If he makes a profit of ₹111, then find the list price (in ₹) of the fan.
Group D 06/09/2022 (Afternoon)
(a) 4,200 (b) 3,680 (c) 3,500 (d) 3,660

Q.78. Arvind bought an article for ₹x. He sold it to Biru at a loss of 15%. Biru spent ₹126 on conveyance, and sold it to Meenu at a profit of 25%. If Meenu bought it for ₹1475, then find the value of ₹x.
Group D 06/09/2022 (Afternoon)
(a) ₹1,240 (b) ₹1,160
(c) ₹1,320 (d) ₹1,280

Q.79. A shopkeeper mixes 30 kg wheat costing ₹13.65 per kg with 20 kg wheat costing ₹18.15 per kg. At what rate per kg should he sell the mixed variety of wheat to earn 30% profit (correct to the nearest rupee)?
Group D 08/09/2022 (Afternoon)
(a) 18 (b) 17 (c) 20 (d) 15

Q.80. By selling an article at $\frac{7}{12}$ of its actual selling price, Manav incurs a loss of 16%. If he sells it at 80% of its actual selling price, then the profit percentage is:
Group D 08/09/2022 (Afternoon)
(a) 14.5% (b) 14.8% (c) 15.2% (d) 15.5%

Q.81. Three chairs and two tables cost ₹7,000 and five chairs and three tables cost ₹11,000. What is the cost of four chairs and two tables?
Group D 08/09/2022 (Afternoon)
(a) ₹9,600 (b) ₹8,000
(c) ₹6,000 (d) ₹9,000

Q.82. If the cost price of an item is

₹4,500 and its selling price is ₹3,500, then the loss percentage is:
Group D 09/09/2022 (Morning)
(a) $44\frac{2}{9}$% (b) $55\frac{2}{9}$%
(c) $33\frac{2}{9}$% (d) $22\frac{2}{9}$%

Q.83. A shopkeeper allows 4% discount on his marked price. If the cost price of an article is ₹120 and he has to make a profit of 10%, then his marked price must be:
Group D 09/09/2022 (Morning)
(a) ₹117.50 (b) ₹120.50
(c) ₹137.50 (d) ₹127.50

Q.84. The cost price of an article is 5,000. What should the selling price of the article be so that a profit of 25% is earned?
Group D 09/09/2022 (Afternoon)
(a) ₹6,250 (b) ₹7,250
(c) ₹5,250 (d) ₹8,250

Q.85. A dishonest shopkeeper uses false weights. He gains 30% on purchasing and 30% on selling. His profit percentage is:
Group D 09/09/2022 (Evening)
(a) 99% (b) 79% (c) 69% (d) 89%

Q.86. The cost of 2 kg of apples and 2 kg of grapes on a day was found to be ₹160. After a month, the cost of 4 kg of apples and 3 kg of grapes was ₹300. Assuming the costs were not changed during the month, the cost of apples (per kg) will be:
Group D 09/09/2022 (Evening)
(a) ₹20 (b) ₹40 (c) ₹120 (d) ₹60

Q.87. A shopkeeper sells one battery for ₹650 at a profit of 30% and another battery for ₹950 at a loss of 5%. His overall gain or loss percentage is:
Group D 09/09/2022 (Evening)
(a) $8\frac{2}{3}$% gain (b) $9\frac{2}{3}$ %loss
(c) $6\frac{2}{3}$%gain (d) $7\frac{2}{3}$%loss

Q.88. A merchant purchased an item for ₹1,500. How much should he mark on the item to earn 20% profit after allowing 20% discount?
Group D 12/09/2022 (Morning)
(a) ₹2,250 (b) ₹1,800
(c) ₹1,650 (d) ₹2,000

Q.89. A man bought mangoes at the rate of 12 for ₹900 and sold them at the rate of 9 for ₹1,200. His profit percentage in the transaction is:
Group D 12/09/2022 (Morning)
(a) $77\frac{7}{9}$% (b) $66\frac{7}{9}$%
(c) $99\frac{8}{9}$% (d) $88\frac{8}{9}$%

Q.90. A man buys a car for ₹2,50,000 and spends ₹30,000 on its repairs. If he sells the car for ₹3,50,000, then his profit percentage is:
Group D 12/09/2022 (Afternoon)
(a) 32% (b) 33.33% (c) 3.28% (d) 25%

Q.91. A dishonest dealer professes to sell his goods at cost price but he uses a weight of 800g for a weight of 1 kg. His profit percentage is:
Group D 12/09/2022 (Evening)
(a) 35% (b) 45% (c) 55% (d) 25%

Q.92. If a shopkeeper sells 25 articles at ₹45 per article after giving 10% discount and earns 50% profit. If the discount is not given the percentage profit gained (rounded off to two decimal places)is:
Group D 12/09/2022 (Evening)
(a) 65.56% (b) 55.55%
(c) 66.67% (d) 56.65%

Q.93. If the cost price of an article is ₹3,200 and its selling price is ₹4,700, then the profit percentage is:
Group D 13/09/2022 (Morning)
(a) $46\frac{7}{8}$% (b) $46\frac{8}{9}$%
(c) $56\frac{7}{8}$% (d) $56\frac{8}{9}$%

Q.94. A man sells a cupboard at a certain price S, 20% of which is his profit. If the price at which he buys the cupboard increases by 10% and he sells it at a 4% higher price than S, then his profit percentage will be:
Group D 13/09/2022 (Afternoon)
(a) 22.7% (b) 23.4% (c) 18.18% (d) 21.8%

Q.95. A man buys a table for ₹2,800 and sells it at a loss of 30%. The selling price (in₹) of the table is_____.
Group D 13/09/2022 (Evening)
(a) 1,890 (b) 1,960 (c) 1,440 (d) 1,770

Q.96. A person sells a sofa at a certain price. If he sold it at 60% of this price, then there will be a loss of 20%. The percentage profit when sofa was sold at the original selling price is:
Group D 13/09/2022 (Evening)
(a) $33\frac{1}{3}$% (b) $12\frac{1}{2}$ % (c) $15\frac{1}{2}$% (d) 12 %

Q.97. A person sells an article for ₹1,820 and loses 9%. If he wants to sell it a profit of 9%, the selling price of the article should be:
Group D 14/09/2022 (Morning)
(a) ₹2,180 (b) ₹2,080
(c) ₹2,480 (d) ₹2,280

Q.98. A dishonest vendor claims that he is selling goods at their cost price. But he is weighing 850 grams for 1000 grams. What is his profit percentage (rounded off to 2 decimal places)?
Group D 14/09/2022 (Afternoon)
(a) 14.65% (b) 15.65%
(c) 17.65% (d) 16.65%

Q.99. A shopkeeper marked the price of an article at 10% higher than its cost price. He then gives two successive discounts of 5% each.What is his loss or profit percentage?
Group D 14/09/2022 (Evening)
(a) 0.725% profit (b) 0.725% loss
(c) 0.525% loss (d) 0.525% profit

Q.100. A man sells two articles for ₹20,000 each. He gets a profit of 15% on one article and loses 15% on the other article. What is his overall profit or loss (to the nearest integer) in this transaction?
Group D 15/09/2022 (Morning)
(a) ₹1,021 loss (b) ₹921 loss
(c) ₹1,021 profit (d) ₹921 profit

Q.101. Ramesh buys a radio for ₹4,000. He sells it at a profit of 10% to Mohan. Mohan spends ₹500 on it. Then he sells it at a profit of 12% to Ritwik. The cost price of the radio to Ritwik is :
Group D 15/09/2022 (Evening)
(a) ₹5,288 (b) ₹4,900
(c) ₹5,088 (d) ₹5,488

Q.102. A shopkeeper sells wheat at ₹20/kg that he purchased at ₹18/kg and he gives only 900 gm of wheat instead of 1 kg while selling. The actual percentage profit to the shopkeeper is:
Group D 15/09/2022 (Evening)
(a) 23.45% (b) 24.45%
(c) 20.45% (d) 22.45%

Q.103. A shopkeeper purchased 70 kg of onions for ₹560 and sold the whole lot at the rate of ₹10 per kg. What will be his gain Percentage?
Group D 16/09/2022 (Afternoon)
(a) 28% (b) 17.5% (c) 25% (d) 20%

Q.104. A vendor claims to sell wheat at a loss of 20% But he cheats by using weights that weigh 40% less than what is mentioned on them. What is his profit percentage (rounded off to 2 decimal places)?
Group D 16/09/2022 (Afternoon)
(a) 35.33% (b) 16.67%

(c) 33.33% (d) 34.33%

Q.105. If a man was to sell an article for ₹840, he would lose 20%. To gain 25% he should sell it for_____.
Group D 16/09/2022 (Evening)
(a) ₹1,312.50 (b) ₹1,300.50
(c) ₹1,200.50 (d) ₹1,212.50

Q.106. A wholesaler sells a tin of oil at ₹540 and bears a loss of 10%. Now, if he decides to sell another tin of oil with same cost at ₹696, his profit percentage in the sale of second tin will be equal to
Group D 17/09/2022 (Morning)
(a) 15% (b) 16% (c) 12% (d) 18%

Q.107. Ashish sold a cow to Bipin for ₹ 5,000 by losing 20%. Bipin sold it to Kasim at that price which would have given Ashish a profit of 15%. What is Bipin's gain in this transaction?
Group D 17/09/2022 (Morning)
(a) ₹2,100.00 (b) ₹1,250.00
(c) ₹2,187.50 (d) ₹937.50

Q.108. By selling a computer for ₹30,875, a shopkeeper suffers a loss of 5%. At what price should he sell it to gain 7%?
Group D 17/09/2022 (Afternoon)
(a) ₹34,775 (b) ₹35,525
(c) ₹33,985 (d) ₹36,105

Q.109. A dealer sold his goods at a discount of 20% but set the marked price of each article at 30% above the cost price. His gain percentage on each article is_____.
Group D 17/09/2022 (Afternoon)
(a) 4% (b) 8% (c) 5% (d) 10%

Q.110. A trader offers a discount of 10% on an article if a customer makes the payment in cash. How much percentage above the cost price should he mark the article to make a profit of 10%? [Give your answer correct to 2 decimal places.]
Group D 17/09/2022 (Evening)
(a) 15.22% (b) 11.22%
(c) 20.22% (d) 22.22%

Q.111. The marked price of an article is ₹ 150. The shopkeeper offers a discount of 20% on the purchase of the article. Thereby. he makes a profit of 25%. The cost price of the article is:
Group D 17/09/2022 (Evening)
(a) ₹72 (b) ₹96 (c) ₹144 (d) ₹120

Q.112. Balaram sells a Bluetooth device to Krishna at a profit of 12%. Krishna sells it to Arjun at a profit of 10%. If Arjun pays ₹1,540 for it, what is the cost price of the Bluetooth device for Krishna?
Group D 18/09/2022 (Morning)
(a) ₹1400 (b) ₹1250
(c) ₹1320 (d) ₹1370

Q.113. The cost price of an article is ₹1,200. The vendor wants to earn a profit of 15% after giving a discount of 10%. What is the marked price of the article? [Give your answer correct to the nearest integer.]
Group D 18/09/2022 (Morning)
(a) ₹1566 (b) ₹1433
(c) ₹1466 (d) ₹1533

Q.114. Anand bought a car for ₹8,00,000 and sold it for a profit of 5% to Dhiraj. Dhiraj sold it at a loss of 4% to Anil. What is the amount paid by Anil for the car?
Group D 19/09/2022 (Morning)
(a) ₹8,60,000 (b) ₹8,06,400
(c) ₹8,40,000 (d) ₹8,73,600

Q.115. A shopkeeper sells pulses at ₹100 per kg that he purchased for ₹80 per kg. While selling, he cheats and gives 800 g instead of 1 kg. What is his actual profit?
Group D 19/09/2022 (Afternoon)
(a) 64.00% (b) 56.25%
(c) 62.75% (d) 58.00%

Q.116. A shopkeeper allows 18% discount on the marked price of an article and still makes a profit of 23%. If he gains ₹1,840 on the sale of the article, then what is the marked price of the article?
Group D 19/09/2022 (Evening)
(a) ₹15,000 (b) ₹9,840
(c) ₹12,000 (d) ₹10,000

Q.117. The total cost price of 100 apples is ₹700. They are sold at a rate of ₹96 per dozen. The profit percentage is_____.
Group D 19/09/2022 (Evening)
(a) $14\frac{2}{7}\%$ (b) $8\frac{2}{3}\%$
(c) $13\frac{1}{7}\%$ (d) $24\frac{1}{7}\%$

Q.118. A man sold a horse at a loss of 7%. Had he sold at 9% profit, he would have got ₹ 6,400 more. So what was the original price of the horse?
Group D 20/09/2022 (Afternoon)
(a) ₹40,000 (b) ₹50,000
(c) ₹55000 (d) ₹45,000

Q.119. A dishonest dealer professes to sell his goods at cost price, but he uses a weight of 950 gm for a kilogram. His gain percent is:
Group D 20/09/2022 (Evening)
(a) $4\frac{5}{19}\%$ (b) $5\frac{5}{19}\%$
(c) $7\frac{5}{19}\%$ (d) $6\frac{5}{19}\%$

Q.120. A dishonest dealer sells goods at a $6\frac{1}{4}\%$ loss on cost price but actually gives 14 gm of goods for every 16 gm that is mentioned on the weight. His gain or loss percent is:
Group D 20/09/2022 (Evening)
(a) $7\frac{1}{3}\%$ loss (b) $6\frac{1}{7}\%$ loss
(c) $7\frac{1}{7}\%$ gain (d) $6\frac{1}{7}\%$ gain

Q.121. The marked price of a jacket is ₹1,050. The shopkeeper earns a profit of 25% even after giving a discount of 10%. At what cost did the shopkeeper purchase it?
Group D 22/09/2022 (Afternoon)
(a) ₹856 (b) ₹905 (c) ₹682 (d) ₹756

Q.122. 15 articles are sold at the total cost price of 20 articles. The gain or loss per cent is:
Group D 22/09/2022 (Afternoon)
(a) $33\frac{1}{3}\%$ gain (b) $33\frac{1}{3}\%$ loss
(c) 20% loss (d) 20% gain

Q.123. Find the SP of an article whose marked price is ₹4,500 and discount allowed is 4.2%.
Group D 22/09/2022 (Evening)
(a) ₹4,441.00 (b) ₹4,111.00
(c) ₹4,311.00 (d) ₹4,213.45

Q.124. The cost of a keyboard and a mouse is ₹3,600. If the cost of the keyboard is seven times that of the mouse, what is the cost of the keyboard?
Group D 22/09/2022 (Evening)
(a) ₹3,050 (b) ₹600 (c) ₹450 (d) ₹3,150

Q.125. A house and a garden together cost ₹51 lakh and the cost of the garden is $\frac{5}{12}$ of the cost of the house. Find the cost of the garden (in ₹).
Group D 26/09/2022 (Morning)
(a) 16 lakh (b) 30 lakh
(c) 15 lakh (d) 36 lakh

Q.126. If the cost price of an article is ₹800 and if a 15% loss is incurred on selling the article, find the selling price.
Group D 26/09/2022 (Afternoon)
(a) ₹760 (b) ₹780 (c) ₹860 (d) ₹680

Q.127. The selling price of a sewing machine is ₹19,440. If it was sold at 8% profit, find its cost price.
Group D 26/09/2022 (Evening)
(a) ₹20,559.20 (b) ₹16,000.00
(c) ₹18,000.00 (d) ₹17,595.20

Q.128. If the marked price of an article is

₹2,850 and the discount is 21%, then find the selling price.
Group D 27/09/2022 (Afternoon)
(a) ₹2,521.50 (b) ₹2,259.50
(c) ₹2,215.50 (d) ₹2,251.50

Q.129. A trader claims to sell rice at a profit of 25%, but also dishonestly uses a weight which is 15% less than what is mentioned on it. Find the total percentage of profit earned by the trader. (Round the answer to the nearest whole number.)
Group D 28/09/2022 (Morning)
(a) 57% (b) 50% (c) 49% (d) 47%

Q.130.100 eggs were purchased for ₹100. 12 eggs broke in transit. The trader sold the remaining eggs at ₹1.20 per egg. Find his profit.
Group D 28/09/2022 (Morning)
(a) ₹7.60 (b) ₹5.60 (c) ₹6.60 (d) ₹5.06

Q.131. Mr. Rao sold a car at ₹1,64,000, thereby incurring a 20% loss. The cost price of the car was:
Group D 28/09/2022 (Afternoon)
(a) ₹2,05,000 (b) ₹2,00,500
(c) ₹2,50,000 (d) ₹2,00,050

Q.132. Nilesh bought some quantity of barley for ₹5,000. Half of it is sold at a profit of 20%. If Nilesh wishes to make a profit of 15% on the whole, find the selling price (in ₹) of the remaining barley.
Group D 28/09/2022 (Evening)
(a) 2,500 (b) 3,250 (c) 2,750 (d) 3,000

Q.133. A table and a swing were sold for ₹9,936 each. The table was sold for a profit of 8% and the swing was sold for a loss of 8%. What is the gain or loss percentage in the whole transaction?
Group D 29/09/2022 (Morning)
(a) 2% profit (b) 0.64% loss
(c) 0.64% profit (d) No profit no loss

Q.134. A seller makes a profit of 20%. If he uses 10% less weight than the actual weight while selling goods, what is his actual profit percent?
Group D 29/09/2022 (Evening)
(a) 15% (b) 30% (c) 36.6% (d) 33.3%

Q.135. Find the gain percentage, given that Bushra sold her scooter for ₹15,000 gaining one-fifth of the selling price.
Group D 30/09/2022 (Morning)
(a) 10% (b) 20% (c) 15% (d) 25%

Q.136. A man sells potatoes at ₹27 per kg, which he bought at ₹25 per kg. He also uses a faulty weight and each time gives 800 g instead of 1 kg. His actual gain percentage is:
Group D 30/09/2022 (Morning)
(a) 25% (b) 35% (c) 20% (d) 40%

Q.137. Raghu sold an article at a loss of 15%. If he had bought the item at 5% less and had sold it for ₹195 more, then he would have gained 10%. Find the cost price (in ₹) of the article.
Group D 30/09/2022 (Afternoon)
(a) 1,000 (b) 1,500 (c) 750 (d) 1,250

Q.138. The cost of a camera is ₹25,000. A leather case costing ₹2,750 was also sold along with this. Arti bought these two items. After using them for a few years, she sold them for ₹26,085. What is the loss percentage?
Group D 30/09/2022 (Evening)
(a) 5% (b) 6% (c) 4% (d) 8%

Q.139. Aruna bought 8 bananas for ₹25 and sold 6 bananas for ₹20. What is her profit or loss percentage?
Group D 06/10/2022 (Afternoon)
(a) $3\frac{2}{3}$% profit (b) $6\frac{2}{3}$% profit
(c) $5\frac{2}{3}$% loss (d) $6\frac{1}{3}$% loss

Q.140. Arun bought 38 kg of rice for ₹1,710. He sold it at a profit equal to the selling price of 8 kg of it. What is the selling price of 5 kg of rice?
Group D 06/10/2022 (Evening)
(a) ₹285 (b) ₹280 (c) ₹295 (d) ₹290

Q.141. If a milkman sells milk at ₹50 a litre, he loses ₹2,000. If he sells it at ₹60 a litre, he gains ₹1,500. The total quantity of milk (in litres) he sells is:
Group D 06/10/2022 (Evening)
(a) 400 (b) 150 (c) 350 (d) 200

Q.142. If the cost price of 63 articles is equal to the selling price of 54 articles, then what is the percentage gain or loss?
Group D 07/10/2022 (Morning)
(a) $16\frac{2}{3}$% loss (b) $15\frac{1}{3}$% loss
(c) $16\frac{2}{3}$% gain (d) $15\frac{1}{3}$% gain

Q.143. 50 identical units are purchased at a total price of ₹550 and $\frac{1}{5}$ of these units are sold at a loss of 10%. Find the per unit selling price (In Rs.) of the remaining units to gain 20% on the whole transaction.
Group D 07/10/2022 (Evening)
(a) 15.175 (b) 13.650
(c) 12.250 (d) 14.025

Q.144. A dishonest merchant claims to sell his items at cost price, but gives 200 kg of an item instead of the 250 kg he charges for. What is his percentage of profit in this transaction?
Group D 11/10/2022 (Morning)
(a) 20% (b) 15% (c) 25% (d) 10%

Q.145. 3 kg of apples and 4 kg of oranges cost ₹210, and 5 kg of apples and 2 kg of oranges cost ₹175. Find the cost of 1 kg of apples.
Group D 11/10/2022 (Evening)
(a) ₹37.5 (b) ₹20 (c) ₹25 (d) ₹35.7

RRB NTPC CBT - 2 (09/05/2022 to 17/06/2022)

Q.146. Ram gave a discount of 10% on the marked price of an item and still gained 12.5%. How much would have Ram gained, if he sold the item at the marked price ?
Level 6 (09/05/2022) Shift 1
(a) 27.5% (b) 25% (c) 20% (d) 22.5%

Q.147. The ratio between the marked price and the cost price of an article is 5 : 3. If the selling price of the article is ₹ 3,024 and the shopkeeper gave two successive discounts of 16% and 20%, then how much is the profit or loss (in ₹) ?
Level 6 (09/05/2022) Shift 1
(a) Profit, ₹324 (b) Loss, ₹112
(c) Loss, ₹216 (d) Profit, ₹225

Q.148. A purchased an item for ₹12,300. He spent ₹200 as cartage. He sold it to B at 10% profit, who sold it to C at 6% profit. C marked it at ₹2,915 higher than his cost price and allowed 10% discount to a customer. Find the profit earned by C (in ₹).
Level 6 (09/05/2022) Shift 2
(a) 1,166 (b) 1,170 (c) 1,172 (d) 1,160

Q.149. By selling 8 pens for ₹75, a shopkeeper loses 25%. How many pens should he sell for ₹372 so as to earn a 24% profit ?
Level 4 (10/05/2022) Shift 1
(a) 20 (b) 24 (c) 18 (d) 30

Q.150. A shopkeeper mixes 30 kg of rice which he purchased at 30/kg and 40 kg of rice which he purchased at Rs 28/kg and he sells the entire mixture at Rs 28/kg. What is the profit or loss percentage (approximation to nearest integer) ?
Level 5 (12/06/2022) Shift 1
(a) 3% loss (b) 5% proft
(c) 6% loss (d) 7%profit

Q.151. By selling an item for ₹1,729

Rohini made a loss of 30%. At what price should she sell the item to make a gain of 16% ?
Level 5 (12/06/2022) Shift 2
(a) ₹2,865.50 (b) ₹2,856.20
(c) ₹2,865.20 (d) ₹2,866.40

Q.152. By selling an article for rs 211.20, a trader loses 12%. If he sells it for Rs 248.40, then his loss/gain percent is
Level 2 (13/06/2022) Shift 1
(a) Loss, 5% (b) Gain, 5.5%
(c) Gain, 3.5% (d) Loss, 2.5%

Q.153. The initial profit percentage on the sale of an item was 74%. If the cost price of the item went up by 50% but the selling price remained the same, what would be the new profit percentage ?
Level 2 (13/06/2022) Shift 2
(a) 13% (b) 24% (c) 16% (d) 8%

Q.154. A dealer sells an article for ₹ 123 after offering a discount of 18% on its marked price. If he sells it on the marked price, he gains 25%. What is the cost price (in ₹) of the article ?
Level 2 (13/06/2022) Shift 2
(a) 125 (b) 124 (c) 120 (d) 115

Q.155. The difference between 12% gain and 4% loss on sale of the item was Rs 28. What was the cost price of the item ?
Level 3 (14/06/2022) Shift 1
(a) 168 (b) 175 (c) 196 (d) 189

Q.156. The selling price of 2 blankets are the same. One of the blankets is sold at $66\frac{2}{3}$% profit and the CP of the other blanket is Rs 400 less than its SP. If the total profit on selling both the blankets is 50%, then find the selling price of each blanket.
Level 3 (14/06/2022) Shift 1
(a) 1500 (b) 1510 (c) 1530 (d) 1520

Q.157. Manu purchased an old bike for ₹5,500, spent 12% of this amount on repairs, and had to later sell it at an overall loss of 5%. What was the price at which Manu sold the bike ?
Level 3 (14/06/2022) Shift 2
(a) ₹5,882 (b) ₹5,832 (c) ₹5,872 (d) ₹5,852

Q.158. The difference between 8% profit and 13% loss while selling an item was ₹ 115.50. What was the cost price of the item ?
Level 5 (15/06/2022) Shift 2
(a) ₹540 (b) ₹560 (c) ₹550 (d) ₹580

Q.159. Three varieties of tea, whose cost prices per kg are ₹500, ₹720, ₹900 are blended in the ratio 9 : 5 : 11. What should be the selling price per kg of the blended tea if the seller has to make a profit of 20% ?
Level 5 (15/06/2022) Shift 2
(a) ₹884 (b) ₹854 (c) ₹844 (d) ₹864

Q.160. Arvind bought 120m cloth for ₹ 15000. He sold 45% of it at a gain of 40%, 25% of it at a loss of 10% and the remaining cloth at the cost price. His profit (in ₹) in the entire transaction is
Level 2 (16/06/2022) Shift 1
(a) ₹2325 (b) ₹2035 (c) ₹4180 (d) ₹4075

Q.161. A shopkeeper sells an article at 20% profit. If he had bought the article at 10% less and sold it at ₹18 more than the previous selling price, he would have made 40% profit. What is the original cost price of the article (in ₹) ?
Level 2 (16/06/2022) Shift 1
(a) 350 (b) 280 (c) 300 (d) 320

Q.162. A person bought articles A and B for a total of ₹2,312. He sold A at a loss of 16% and sold B at a gain of 20%. The selling prices of A and B were the same. What was the difference between the cost prices of A and B ?
Level 2 (16/06/2022) Shift 2
(a) 416 (b) 428 (c) 420 (d) 408

Q.163. A vendor sells 15 lemons for 3 rupees gaining 60%. How many did he buy for a rupee ?
Level 2 (16/06/2022) Shift 3
(a) 8 (b) 9 (c) 7 (d) 10

Q.164. Himani bought a washing machine for ₹ 8,000 and spent ₹ 500 on its repairs. She sold it at 20% profit. With the money she got by selling it, she bought another washing machine and sold it at 10% loss. What is her overall loss/profit ?
Level 3 (17/06/2022) Shift 1
(a) Profit ₹ 680 (b) Loss ₹ 600
(c) Profit ₹ 640 (d) Loss ₹ 640

Q.165. A person sells his goods at 30% profit. If the cost price increases by 25%, and the selling price increases by 10%, then what is his new profit percentage ?
Level 3 (17/06/2022) Shift 1
(a) 16.4% (b) 15.6% (c) 14.4% (d) 13.5%

Q.166. By selling an item for Rs. 222, a person incurs a loss of Rs. 48. What is the percentage of loss incurred in the transaction ?
Level 3 (17/06/2022) Shift 3
(a) $18\frac{8}{9}$% (b) $17\frac{7}{9}$ %
(c) $16\frac{7}{18}$ % (d) $21\frac{23}{37}$ %

RRB NTPC CBT - 1 (28/12/2020 to 31/07/2021)

Q.167. The cost price of an article is 75% of the marked price. If a discount of 15% is allowed, then the profit & loss percentage is:
RRB NTPC 28/12/2020 (Morning)
(a) 15.55% Loss (b) 15% profit
(c) 13.33 % profit (d) 12.44 % loss

Q.168 An article was sold at a gain of 12%. Had it been sold for Rs. 33 more, the gain would have been 14%. The cost price of the article is :
RRB NTPC 28/12/2020 (Evening)
(a) 1800 (b) 1850 (c) 1750 (d) 1650

Q.169. A shopkeeper loses 10% on selling an article for Rs 360. To gain 30%, what should have been the selling price of the article?
RRB NTPC 29/12/2020 (Evening)
(a) 740 (b) 600 (c) 480 (d) 520

Q.170. By selling an article for ₹138, a shopkeeper losses 8%. At what price should the article be sold to get a gain of 4%?
RRB NTPC 30/12/2020 (Morning)
(a) ₹156 (b) ₹144 (c) ₹210 (d) ₹90

Q.171. A shop keeper sold two toys for ₹990 each. On first toy he gained 10% and on the second he lost 10%. Find the total percentage gain or loss.
RRB NTPC 30/12/2020 (Morning)
(a) 10% Gain (b) 1% Loss
(c) 1% Gain (d) 10 % Loss

Q.172. A shopkeeper marks his goods at a price so that after allowing a discount of 20%, he still makes a profit of 8%. Find the marked price of the article which costs him 500.
RRB NTPC 30/12/2020 (Evening)
(a) 875 (b) 575 (c) 765 (d) 675

Q.173. By selling an article for Rs 45,000 a man loses 10%. For what amount should he sell it so as to gain 15%.
RRB NTPC 30/12/2020 (Evening)
(a) 67,500 (b) 55,700 (c) 57,500 (d)75,500

Q.174. By selling a car of Rs 1,20,000, David makes a profit of 20%. What will be the selling price of the car if he sells it at 30% profit?
RRB NTPC 04/01/2021 (Evening)
(a) Rs.1,35,000 (b) Rs.1,25,000
(c) Rs.1,40,000 (d) Rs.1,30,000

Q.175. A shopkeeper incurs a loss of 20% afler selling a machine for Rs.4800. In order to gain a profit of 20%, at what

price should the shopkeeper sell the same machine?
RRB NTPC 05/01/2021 (Morning)
(a) 7200 (b) 6000 (c) 6600 (d) 7500

Q.176. Shakila incurs a loss of 10% after selling a machine part for Rs.540. In order to gain a profit of 10%, at what price should Shakila sell the same part?
RRB NTPC 05/01/2021 (Morning)
(a) 60 (b) 550 (c) 660 (d) 600

Q.177. 4% more is gained by selling a table for Rs 1,800 then by selling it for Rs 1,750. What is its cost price?
RRB NTPC 05/01/2021 (Evening)
(a) Rs 125 (b) Rs 12,500
(c) Rs 1,250 (d) Rs 50

Q.178. By reducing the selling price of an article by Rs.50.00, a gain of 5% turns into a loss of 5%. Original selling price is
RRB NTPC 07/01/2021 (Morning)
(a) Rs 550.00 (b) Rs 525.00
(c) Rs 600.00 (d) Rs 500.00

Q.179. By selling a watch for a certain amount, Deepika suffered a loss of 10%. By selling the same watch for Rs140 more she would have gained 4%. What was the cost price of the watch?
RRB NTPC 07/01/2021 (Evening)
(a) Rs 1140 (b) Rs 1000
(c) Rs 860 (d) Rs 760

Q.180. By selling an article for Rs 1785, a dealer loses 15%. At what price should he sell the article to gain 15%?
RRB NTPC 09/01/2021 (Evening)
(a) Rs 1,785 (b) Rs 2,100
(c) Rs 2,415 (d) Rs 2,205

Q.181. Rahim purchased 20 Kg of oranges at a rate of Rs 45 /Kg and sold them at the rate of Rs 54/Kg. During the period 1.5 Kg oranges got spoiled. He sold the spoiled oranges at the rate of Rs. 10/Kg. His net gain or loss percent is:
RRB NTPC 10/01/2021 (Evening)
(a) $12\frac{2}{3}$% gain (b) 14% gain
(c) $13\frac{2}{3}$% loss (d) 14% loss

Q.182. A shopkeeper purchased a machine for Rs. 70,000 and spent Rs 5,000 as overhead expenditure. Had he purchased the machine at 15% less, he would have earned a profit of 15%. What is the selling price of the machine.
RRB NTPC 10/01/2021 (Evening)
(a) Rs 74,000 (b) Rs 75,000
(c) Rs 78,175 (d) Rs 74,175

Q.183. By selling an article for Rs. 2,340, the dealer loses 10%. At which price should he sell the article to gain 15%?
RRB NTPC 11/01/2021 (Evening)
(a) Rs.2990 (b) Rs.2350
(c) Rs.2365 (d) Rs. 2600

Q.184. The cost price of a car was Rs 1,50,000 Raju sold it to Montoo at a profit of 5%, and later Montoo sold it back to Raju at 2% loss. Find the total profit or loss in the entire transaction?
RRB NTPC 12/01/2021 (Morning)
(a) Raju's gain Rs. 3,150
(b) Raju's gain Rs. 4,500.
(c) Raju's loss Rs. 4,350
(d) Raju's gain Rs. 4,350

Q.185. How much percentage above the cost price should a shopkeeper mark his goods so that afier allowing a discount 25% he should gain 12%?
RRB NTPC 12/01/2021 (Evening)
(a) $33\frac{1}{3}$% (b) 25% (c) $49\frac{1}{3}$% (d) 40%

Q.186. A Laptop costs Rs.27,000. You have to pay 15% extra to purchase an extended warranty of 2 years. What will be the final cost of the laptop if 6% GST must be paid on the whole?
RRB NTPC 13/01/2021 (Morning)
(a) Rs.31,050 (b) Rs.31,293
(c) Rs.32,670 (d) Rs.32,913

Q.187. When cost price of x articles is equal to the selling price of y articles, the profit is 25%. Then x : y is equal to..
RRB NTPC 13/01/2021 (Morning)
(a) 5 : 4 (b) 3 : 5 (c) 4 : 5 (d) 5 : 3

Q.188. A man bought a horse for a certain amount and sold it at a loss of 8% . If he had received Rs. 1,800 more, he would have gained $14\frac{1}{2}$ % . The cost price of the horse is..
RRB NTPC 13/01/2021 (Morning)
(a) Rs 5000 (b) Rs 8000
(c) Rs 3500 (d) Rs 6000

Q.189. A shopkeeper purchased an article for Rs.3,000. What will be the percentage of profit (approximately) if he sells that article for Rs.3,600?
RRB NTPC 13/01/2021 (Evening)
(a) 15% (b) 22% (c) 20% (d) 17%

Q.190. Ramesh buys an article for 15% less than its original value, and sells it for 10% more than its original value. Find the percentage of gain (approximately).
RRB NTPC 13/01/2021 (Evening)
(a) 25.62% (b) 41.52%
(c) 31.25% (d) 29.41%

Q.191. Tony purchases two cars A and B at a total cost of Rs. 6,50,000. He sells car A with 20% profit and car B at a loss of 25% and gets the same selling price for both cars. What are the purchasing prices of car A and car B respectively?
RRB NTPC 16/01/2021 (Morning)
(a) Rs. 2,00,000 ; Rs. 4,50,000
(b) Rs. 3,00,000 ; Rs. 3,50,000
(c) Rs. 2,50,000 ; Rs. 4,00,000
(d) Rs. 4,50,000 ; Rs. 2,00,000

Q.192. A vendor bought toffees at 10 for a rupee. How many for a rupee must he sell to gain 25% ?
RRB NTPC 16/01/2021 (Evening)
(a) 6 (b) 8 (c) 30 (d) $\frac{1}{5}$

Q.193. The cost price of 120 pens is the same as the selling price of x pens. If the profit is 25%, then the value of x is:
RRB NTPC 16/01/2021 (Evening)
(a) 96 (b) 91 (c) 95 (d) 90

Q.194. Vikas buys an old bike for Rs 30,000 and spends Rs 5,000 on its repairs. If he sells the bike for Rs 42,000. his gain percentage is:
RRB NTPC 16/01/2021 (Evening)
(a) 18% (b) 20% (c) 17% (d) 19%

Q.195. X purchased a car at Rs. 1,50,000 and then sold it to Y at a profit of 5%. Y later sold it back to X at a loss of 2%. Find the overall profit or loss for X in the entire transaction.
RRB NTPC 17/01/2021 (Morning)
(a) X gain Rs. 3,150 (b) X loss Rs. 4350
(c) X gain Rs. 4500 (d) X gain Rs. 4350

Q.196. Surita buys two old Samsung and three Mi mobile phones for Rs. 40,200. If she sells the Samsung phones at a 10% profit and the Mi phones at a 20% profit then her total profit is Rs. 5,640. The cost price of the Mi phone is:
RRB NTPC 17/01/2021 (Evening)
(a) Rs. 5,000 (b) Rs. 4,400
(c) Rs. 5,400 (d) Rs. 1,200

Q.197. The cost price of a car was Rs. 1,50,000 . It was sold by X at a profit of 5% to Y. It was sold back to X by Y at a 1% loss. Find X% profit in the entire classification.
RRB NTPC 17/01/2021 (Evening)
(a) Rs. 4,000 (b) Rs. 1,575
(c) Rs. 4,500 (d) Rs. 3,150

Q.198. A shopkeeper sells a chair for Rs.639 and incurs a loss of 10%. What is the cost price (in Rs) of the chair?
RRB NTPC 18/01/2021 (Evening)
(a) 700 (b) 615 (c) 600 (d) 710

Q.199. Ram bought a cycle for Rs. 1,900 and sold it for Rs.1,862. What was the percentage loss?
RRB NTPC 18/01/2021 (Evening)
(a) 6% (b) 4% (c) 8% (d) 2%

Q.200. Bananas are bought at the rate of 3 for Rs. 2 and sold at the rate of 2 for Rs. 3. Find the percentage gain.
RRB NTPC 19/01/2021 (Morning)
(a) 125% (b) 135% (c) 115% (d) 105%

Q.201. A vendor bought bananas at the rate of 6 for Rs. 10 and sold them at the rate of 4 for Rs. 6. What is the percentage gain or loss?
RRB NTPC 19/01/2021 (Morning)
(a) 20% (b) 10% (c) 90% (d) 30%

Q.202. In selling 33 m cloth, Rain's profit is equal to the selling price of 11 m cloth, then what is her gain percent?
RRB NTPC 19/01/2021 (Evening)
(a) 20% gain (b) 50% gain
(c) 60% gain (d) 30% gain

Q.203. A sells a radio to B at a gain of 10% and B sells it to C at a gain of 5%. If C pays Rs. 462 for it, then what did it cost A(in Rs.)?
RRB NTPC 19/01/2021 (Evening)
(a) 400 (b) 390 (c) 410 (d) 420

Q.204. If the cost price of 10 shirts is equal to the selling price of 8 shirts, then what will be the percentage gain and loss?
RRB NTPC 20/01/2021 (Morning)
(a) 25% loss (b) 20% gain
(c) 25% gain (d) 20% loss

Q.205. If an article is sold at a gain of 5% instead of being sold at a loss of 5%, a man gets Rs 5 more. What is the cost price of the article?
RRB NTPC 20/01/2021 (Evening)
(a) Rs 80 (b) Rs 40 (c) Rs 60 (d) Rs 50

Q.206. In April, the profit of a bookstore increased by 25%, and in May, it decreased by 20%. How did the profit of the store at the end of May compare to that in the beginning of April?
RRB NTPC 20/01/2021 (Evening)
(a) It was less (b) It was 25% greater
(c) It was same (d) It was 5% greater

Q.207. When a bicycle manufacturer reduced the selling price of a bicycle by 50%, the number of bicycles sold radically increased by 700%. Initially, the manufacturer was getting a profit of 140%. What is the new profit percentage?
RRB NTPC 21/01/2021 (Evening)
(a) 30% (b) 40% (c) 10% (d) 20%

Q.208. A dealer buys 200 quintals of wheat at Rs1,200 per quintal. He spends Rs. 10,000 on transportation and storage. If he sells the wheat at Rs.13 per kg, then the profit percentage of the dealer is:
RRB NTPC 21/01/2021 (Evening)
(a) 3% (b) 1% (c) 2% (d) 4%

Q.209. The selling articles at Rs. 31, a shopkeeper losses 7%. What will the profit percentage be when he sells the same article at Rs. 35?
RRB NTPC 22/01/2021 (Morning)
(a) 4% (b) 5% (c) 7% (d) 6%

Q.210. In a transaction, the profit percentage is 20% of the cost. If the cost increases by 5% but the selling price remains the same, how much is the decrease in percentage profit?
RRB NTPC 22/01/2021 (Evening)
(a) 7% (b) 14.28% (c) 8% (d) 14%

Q.211. A boy bought some toffee at the rate of 15 toffees for Rs. 3 and sold all of them at the rate of 3 toffee for Rs. 2. Find the gain or loss.
RRB NTPC 23/01/2021 (Morning)
(a) $233\frac{1}{3}\%\ loss$ (b) $233\frac{1}{3}\%\ gain$
(c) $233\frac{2}{3}\%\ loss$ (d) $233\frac{2}{3}\%\ gain$

Q.212. By selling a vehicle for Rs. 52,500, Ram suffers a 25% loss. What was his loss?
RRB NTPC 23/01/2021 (Morning)
(a) Rs. 16,500 (b) Rs. 17,000
(c) Rs. 17,500 (d) Rs. 18,000

Q.213. By selling 50 mangoes for Rs.30, a person loses 10%. How many mangoes should he sell for Rs. 28 to gain 20%?
RRB NTPC 23/01/2021 (Evening)
(a) 35 (b) 25 (c) 30 (d) 20

Q.214. A person sells his table at a profit of $12\frac{1}{2}\%$ and chair at a loss of $8\frac{1}{3}\%$ but on the whole he gains Rs. 25. On the other hand, if he sells the table at a loss of $8\frac{1}{3}\%$ and the chair at a profit of $12\frac{1}{2}\%$ then he neither gains nor loses. Find the cost price of the table.
RRB NTPC 25/01/2021 (Morning)
(a) Rs. 380 (b) Rs. 370
(c) Rs. 360 (d) Rs. 350

Q.215. An article is sold at a profit of 20% .If both the cost price and selling price are Rs. 100 less, the profit will be 4% more. Find the cost price.
RRB NTPC 25/01/2021 (Morning)
(a) Rs. 800 (b) Rs. 500
(c) Rs. 700 (d) Rs. 600

Q.216. Find percentage loss when cost price = Rs 850 and selling price = Rs 680.
RRB NTPC 25/01/2021 (Evening)
(a) 30% (b) 25% (c) 35% (d) 20%

Q.217. Sohan made a loss of 20% by selling his old fan for Rs. 1500. At what price should he sell the fan so that he can make a profit of 20%.
RRB NTPC 25/01/2021 (Evening)
(a) Rs. 2,200 (b) Rs. 2,300
(c) Rs. 2,150 (d) Rs. 2,250

Q.218. A vendor sells 10 oranges for Rs 1 and gains 30%. How many oranges did he buy for Rs 1?
RRB NTPC 25/01/2021 (Evening)
(a) 11 (b) 13 (c) 7 (d) 9

Q.219. The mean daily profit by a shopkeeper in a month of 30 days was Rs. 450. If the mean profit for the first 20 days was Rs. 300, then the mean profit for the last 10 days will be:
RRB NTPC 27/01/2021 (Morning)
(a) Rs. 750 (b) Rs. 250
(c) Rs. 500 (d) Rs. 260

Q.220. A man buys two tables for Rs.1,350. He sells one with a loss of 6% and sells the other to gain $7\frac{1}{2}\%$. Overall, he neither loses nor gains. What is the difference between the cost price of the two tables?
RRB NTPC 27/01/2021 (Evening)
(a) Rs.50 (b) Rs. 125
(c) Rs.100 (d) Rs.150

Q.221. Abir sells an article to Kunal at the profit of 15% and Kunal sells it to Amar at the profit of 10%. If Amar pays Rs 5,060 for it. What was its original cost price?
RRB NTPC 28/01/2021(Morning)
(a) Rs 4,500 (b) Rs 6,000
(c) Rs 5,000 (d) Rs 4,000

Q.222. By selling cakes at Rs 84 per dozen, a baker earns a profit of 12%. At what price must he sell each cake to earn a profit of 20%?
RRB NTPC 28/01/2021(Morning)
(a) Rs 8.50 (b) Rs 7.50
(c) Rs 9.50 (d) Rs 10.50

Q.223. A man incurs a loss of 15% by selling a radio for Rs. 510. At what price should he sell it in order to make a profit

of 15%?
RRB NTPC 28/01/2021 (Evening)
(a) Rs. 670 (b) Rs. 660
(c) Rs. 680 (d) Rs. 690

Q.224. By selling an article at 90% of the marked price, there is a loss of 7%. If the article is sold at the marked price, the percentage profit will be:
RRB NTPC 29/01/2021 (Morning)
(a) 3.15 % (b) 3.5 % (c) 3.43 % (d) 3.33%

Q.225. The cost of a pair of roller skates was Rs. 450. The Sales tax charged was 5%. Find the bill amount.
RRB NTPC 29/01/2021 (Morning)
(a) Rs. 480.50 (b) Rs. 472.50
(c) Rs. 470.50 (d) Rs. 460

Q.226. Find the gain percentage when the cost price is Rs.950 and the selling price is Rs.1,140.
RRB NTPC 29/01/2021 (Evening)
(a) 10% (b) 30% (c) 20% (d) 40%

Q.227. Mr. Cook sold a book at a profit of 14%. If he had sold it for Rs.5.40 more, then he would have made a profit of 20%. Find the cost price of the book.
RRB NTPC 29/01/2021 (Evening)
(a) Rs.120 (b) Rs.30 (c) Rs.90 (d) Rs.60

Q.228. A profit of 20% is earned by selling an article for Rs.2,400. If the same article were sold for Rs.2,600, then the gain percentage would be:
RRB NTPC 29/01/2021 (Evening)
(a) 30% (b) 35% (c) 25% (d) 20%

Q.229. 5% more is gained by selling a cow for Rs. 1,010 than what is gained by selling it for Rs 1,000. Find the cost price (in Rs) of the cow.
RRB NTPC 30/01/2021 (Morning)
(a) 400 (b) 200 (c) 300 (d) 280

Q.230. A dealer sells a table for Rs 400, making a profit of 25%. He sells another table at a loss of 10% and on the whole he makes neither profit nor loss. How much (in Rs) did the second table cost him?
RRB NTPC 30/01/2021 (Morning)
(a) 750 (b) 850 (c) 800 (d) 700

Q.231. The selling price of a toy car is Rs 540. If the profit made by the shopkeeper is 20%. What will be the cost price of this toy car ?
RRB NTPC 30/01/2021 (Evening)
(a) Rs 350 (b) Rs 250
(c) Rs 450 (d) Rs 400

Q.232. The difference between the selling prices at a 14% profit and at a 10% loss while selling an article is Rs 60. What is the cost price of the article?
RRB NTPC 31/01/2021 (Morning)
(a) Rs.225/- (b) Rs.250/-
(c) Rs.235/- (d) Rs.240/-

Q.233. What percentage of profit on cost price equals 20% of profit on selling price?
RRB NTPC 31/01/2021 (Evening)
(a) 28% (b) 30% (c) 25% (d) 22%

Q.234. The cost of a flower vase is Rs 120. If the shopkeeper sells it at a loss of 5%, what will be the selling price (in rs)?
RRB NTPC 01/02/2021 (Morning)
(a) 115 (b) 126 (c) 114 (d) 125

Q.235. If a shopkeeper added 20% on the cost price as marked price and gave 20% discount, then how much was his profit or loss percent?
RRB NTPC 01/02/2021 (Evening)
(a) 6% loss (b) 4% profit
(c) 6% profit (d) 4% loss

Q.236. Rupert purchases a second hand TV for Rs. 4,600 and spends some money on repairing it, and then sells it for Rs 5,406 thereby earning a profit of 6%. How much did Rupert spend on the repairs?
RRB NTPC 02/02/2021 (Morning)
(a) Rs 500 (b) Rs 600
(c) Rs 450 (d) Rs 400

Q.237. A man sold 2 articles for Rs 4,000 each, gained 15% on one and lost 15% on the other. What is the total gain or loss rounded to the nearest integer?
RRB NTPC 02/02/2021 (Evening)
(a) Rs. 200 gain (b) Rs. 190 loss
(c) Rs. 184 loss (d) Rs. 175 gain

Q.238. The sum of cost prices of two bikes is Rs.1,00,000. One bike was sold at a profit of 20% and the second one was sold at a loss of 20%. If the selling prices are same, what is the cost price of the first bike sold?
RRB NTPC 02/02/2021 (Evening)
(a) Rs. 60,000 (b) Rs. 35,000
(c) Rs. 50,000 (d) Rs. 40,000

Q.239. A television manufacturer earns a profit of 10% by selling one TV set for Rs. 24,750. If the production cost is increased by 15%, then what should be the new selling price of the TV set so as to gain a profit of 15%?
RRB NTPC 04/02/2021 (Morning)
(a) Rs. 27,756.25 (b) Rs. 29,756.25
(c) Rs, 28, 756.25 (d) Rs. 26,756.25

Q.240. A tradesman marks his goods 25% above the cost price and allows his customers a 12% reduction on their bills. What percentage profit does he make?
RRB NTPC 08/02/2021 (Evening)
(a) 12.5% (b) 14% (c) 18% (d) 10%

Q.241. A retailer marks all his goods at 50% above the cost price and thinking that he will still make 25% profit, offers a discount of 25% on the marked price. What is the actual price on the sales?
RRB NTPC 09/02/2021 (Morning)
(a) 17% (b) 12.60% (c) 12.50% (d) 12%

Q.242. A man purchased an item for Rs 1,200, spent Rs 300 on its repairs and sold it for Rs 2,000. What is the profit percentage?
RRB NTPC 11/02/2021 (Evening)
(a) $33\frac{1}{3}$% (b) 33% (c) 66.66% (d) 40%

Q.243. A man sold a radio set for Rs. 750 and gained one ninth of its cost price. Find the cost price of the radio and the percentage gain respectively.
RRB NTPC 12/02/2021 (Morning)
(a) Rs. 555 and $\frac{100}{9}$%
(b) Rs. 635 and $\frac{100}{9}$%
(c) Rs. 655 and $\frac{100}{9}$%
(d) Rs. 675 and $\frac{100}{9}$%

Q.244. A man purchased 20 dozen mangoes for Rs. 1,000 . Out of these, 40 mangoes were rotten and could not be sold. At what rate per dozen should he sell the remaining mangoes to make a profit of 30%?
RRB NTPC 15/02/2021 (Morning)
(a) Rs. 80 (b) Rs. 78 (c) Rs. 70 (d) Rs. 72

Q.245. While selling an item, the difference between selling it at 11% profit and 13% loss is Rs.204. What is the cost price of the item?
RRB NTPC 17/02/2021 (Evening)
(a) Rs. 748 (b) Rs.850
(c) Rs.816 (d) Rs.765

Q.246. Mahesh purchased a cooker at nine-tenth of its marked price and sold it for 8% more than its marked price. Find the gain percentage
RRB NTPC 27/02/2021 (Morning)
(a) 16% (b) 14% (c) 10% (d) 20%

Q.247. A vendor bought 12 items for a rupee. How many for a rupee should he sell to gain 20%?
RRB NTPC 27/02/2021 (Evening)
(a) 9 (b) 10 (c) 8 (d) 11

Q.248. The ratio between the sale price and the cost price of an article is 7 : 4. What is the ratio between the profit and the cost price of the article?
RRB NTPC 27/02/2021 (Evening)
(a) 5 : 6 (b) 4 : 5 (c) 2 : 5 (d) 3 :4

Q.249. An article passing through two hands was sold at a total gain of 38% on the original price. If the first person sold it at a gain of 15%, then what was the gain percentage of the second person?
RRB NTPC 01/03/2021 (Morning)
(a) 20% (b) 18% (c) 10% (d) 12%

Q.250. A motor car worth Rs 2,00000/- is sold by Ramu at 5% profit to Rahul. Rahul sells the motor car back to Ramu at 2% loss. Ramu's net profit (in Rs.) in complete transaction is:
RRB NTPC 02/03/2021 (Morning)
(a) 4,200 (b) 3,208
(c) 2,058 (d) 3,200

Q.251. A woman buys a car at 24% discount of the printed price and sells it at a 20% higher of printed price. Her percentage gain is:
RRB NTPC 02/03/2021 (Evening)
(a) $5\frac{17}{19}$% (b) $57\frac{17}{19}$ %
(c) $7\frac{17}{19}$% (d) $57\frac{7}{19}$ %

Q.252. The profit earned after selling an article for Rs.1,875 is the same as the loss occurred after selling the article for Rs.1,385. What is the cost price (in Rs) of the article?
RRB NTPC 02/03/2021 (Evening)
(a) Rs.1,660 (b) Rs.1,650
(c) Rs.1,360 (d) Rs.1,630

Q.253. A man sells flowers at 4% loss on cost of price but he uses 20 g instead of 25g weight to measure. What is his percentage profit?
RRB NTPC 03/03/2021 (Morning)
(a) 40% (b) 60% (c) 20% (d) 10%

Q.254. A shopkeeper bought 25 chairs from a manufacturer for Rs. 37,500 and sold them at a profit equal to the selling price of 5 chairs. Then the SP of one chair is.
RRB NTPC 03/03/2021 (Evening)
(a) Rs.1500 (b) Rs.1200
(c) Rs.1250 (d) Rs.1875

Q.255. A man bought a number of apples at 5 for Rs. 50 and an equal number at 6 for Rs. 50. If he sells them at 11 for Rs. 100, what would be his percentage profit or loss?
RRB NTPC 03/03/2021 (Evening)
(a) $\frac{100}{121}$% loss (b) $\frac{100}{121}$% profit
(c) $\frac{121}{100}$% loss (d) $\frac{121}{100}$% profit

Q.256. A retailer buys 20 pens at the marked price of 15 pens from a wholesaler. If he sells these 20 pens giving a discount of 1%, then what is the profit percent of the retailer?
RRB NTPC 04/03/2021 (Morning)
(a) 35% (b) 25% (c) 32% (d) 30%

Q.257. Ram invested Rs. 42,000/- in the shares of a company. He sold one-third of the total shares at a profit of 10%. He sold the remaining shares at 10% loss. How much did Ram lose?
RRB NTPC 04/03/2021 (Evening)
(a) Rs 5,200 (b) Rs 4,200
(c) Rs 1,400 (d) Rs 4,000

Q.258. 40% of the goods are sold at 2% loss while the rest of the goods are sold at 4% profit. If there is a total profit of Rs. 250, then the cost price of goods sold is :
RRB NTPC 05/03/2021 (Morning)
(a) 15625 (b) 5625 (c) 9000 (d) 6525

Q.259. Babu purchased a car for Rs. 300000 and a bike for his son for Rs. 100000. He sold the car at a profit of 10% and bike at loss of 20%. What is the net gain or loss?
RRB NTPC 05/03/2021 (Morning)
(a) 2.5 % gain (b) 2.5% loss
(c) 2 % gain (d) 1.5 % loss

Q.260. The difference between a 16% profit and a 12% loss while selling an article is Rs. 70. What is the cost price of the article?
RRB NTPC 05/03/2021 (Evening)
(a) Rs. 240 (b) Rs. 225
(c) Rs. 250 (d) Rs. 235

Q.261. Qamar sold 18 toys for Rs. 980, thereby making a loss equal to the cost price of 4 toys. What was the cost price of each toy?
RRB NTPC 05/03/2021 (Evening)
(a) Rs. 75 (b) Rs. 80 (c) Rs. 60 (d) Rs. 70

Q.262. After deducting a commission of 10% on the marked price, a T.V. set cost Rs,9,090. What is its marked price?
RRB NTPC 07/03/2021 (Morning)
(a) Rs. 10,010.00 (b) Rs. 10,000.00
(c) Rs. 10,074.75 (d) Rs. 10,100.00

Q.263. By selling an article for Rs. 1600 a person lost 20%. For what amount should it be sold to make a profit of 20%?
RRB NTPC 08/03/2021 (Morning)
(a) Rs. 3600 (b) Rs. 4000
(c) Rs. 2400 (d) Rs. 1200

Q.264. A man sells a car to his friend at a loss of 20%. Then, the friend sells it for Rs. 58,000 at a profit of 30%. The original cost price of the car (to the nearest integral value) was:
RRB NTPC 09/03/2021 (Evening)
(a) Rs. 54,769 (b) Rs. 57,769
(c) Rs. 55,769 (d) Rs. 56,769

Q.265. Padma purchased 80 kg of tomatoes for Rs. 320 and sold them at the rate of Rs. 4.50 per kg. Find the percentage of her gain.
RRB NTPC 11/03/2021 (Morning)
(a) $12\frac{1}{2}$ % (b) $6\frac{1}{4}$ % (c) $4\frac{1}{6}$ % (d) $8\frac{1}{3}$ %

Q.266. Sumanth bought a microwave oven at 15% less than its original price. He sold it at a profit of 35% on the price he had bought it for. By what percentage sales price set by Sumarnt is more than the original price?
RRB NTPC 11/03/2021 (Evening)
(a) 19.56% (b) 14.75%
(c) 12.03% (d) 21.23%

Q.267. A man purchased an item at $\frac{3}{4}$ of its marked price and sold it at 15% more than its marked price. What is his gain percentage?
RRB NTPC 12/03/2021 (Morning)
(a) $1\frac{1}{3}$% (b) $15\frac{1}{5}$%
(c) $53\frac{1}{3}$% (d) $5\frac{1}{3}$%

Q.268. The cost price of an article is 64% of the marked Price. Calculate the percentage gain after allowing a discount of 12%.
RRB NTPC 12/03/2021 (Evening)
(a) 50.5 (b) 37.5 (c) 48 (d) 52

Q.269. Anand purchased a car for Rs.3,75,000 and sold it at a loss of 15%. At what cost did he sell the car?
RRB NTPC 13/03/2021 (Morning)
(a) Rs.3,36,250 (b) Rs. 3,58,000
(c) Rs. 3,18,750 (d) Rs.3, 25,000

Q.270. A profit of 25% is made when an article is sold for Rs. 750. The profit if the article is sold for Rs. 660, will be.
RRB NTPC 13/03/2021 (Evening)
(a) 10% (b) 8% (c) 12% (d) 15%

Q.271. A retailer buys a bag containing 54 kg oranges at Rs. 25 per kg. Later upon sorting he finds that 4 kg oranges are rotten, he throws them and sells the remaining ones at Rs. 36 per kg. Find his

profit percent.
RRB NTPC 15/03/2021 (Evening)
(a) 25% b) 30% (c) $33\frac{1}{3}$% (d) 40%

Q.272. An article when sold at a profit of 10% gains Rs 150 more than when it is sold at a loss of 10%. Its cost price is:
RRB NTPC 19/03/2021 (Morning)
(a) Rs 750 (b) Rs 735
(c) Rs 570 (d) Rs 577

Q.273. A woman sells 78 pencils and gets a profit equal to the selling price of 13 pencils. Her profit percentage is:
RRB NTPC 19/03/2021 (Evening)
(a) 17 (b) 9 (c) 20 (d) 19

Q.274. What will be the percentage profit after selling an article at a certain price. If there is a loss of $12\frac{1}{2}$% when the article is sold at half of that selling price?
RRB NTPC 21/03/2021 (Morning)
(a) 80% (b) 70% (c) 60% (d) 75%

Q.275. A reduction of 10% in the price of mangoes enables a person to buy 10 mangoes more for Rs. 2250. What is the price per dozen after reduction?
RRB NTPC 27/03/2021 (Morning)
(a) Rs. 165 (b) Rs. 250
(c) Rs. 225 (d) Rs. 270

Q.276. A shopkeeper sold an electric blender at a loss of $3\frac{1}{2}$%. Had he sold it for Rs. 172.5 more , be would have gained 8%, To gain 13%, he should sell it for:
RRB NTPC 27/03/2021 (Evening)
(a) Rs. 1,550 (b) Rs. 1,595
(c) Rs. 1,680 (d) Rs. 1,695

Q.277. A sells an article to B at a profit of 20% and B sells it to C at a profit of 20%. If C pays Rs. 360 for it, what was the cost price for A ?
RRB NTPC 01/04/2021 (Morning)
(a) Rs. 308 (b) Rs. 144
(c) Rs. 250 (d) Rs. 120

Q.278. Two articles are sold by a trader. One of them is sold for 20% profit. Its selling price equals the cost price of the other article which is sold for 20% loss. Find the effective profit/loss percentage approximately.
RRB NTPC 03/04/2021 (Morning)
(a) 1.8 % loss (b) 2.5 % profit
(c) 4 % loss (d) 1.8 % profit

Q.279. A person sold his watch for Rs.144 and got a percentage of profit equal to the cost price. Find the cost of the watch.
RRB NTPC 03/04/2021 (Evening)
(a) Rs.180 (b) Rs.200
(c) Rs.100 (d) Rs.80

Q.280. By selling 32 oranges for Rs. 1, a man incurs the loss of 40%. How many oranges must be sell for Rs.1 to gain 20%?
RRB NTPC 03/04/2021 (Evening)
(a) 16 (b) 15 (c) 20 (d) 18

Q.281. A man sells a washing machine for Rs. 21,600 gaining thereby 8%. At what price should he sell it to gain 20%?
RRB NTPC 06/04/2021 (Evening)
(a) Rs. 23,200 (b) Rs. 26,000
(c) Rs. 24,000 (d) Rs. 28,000

Q.282. A fruit seller sells 16 oranges for Rs.42 thereby gaining 25%. How many oranges did he buy for Rs. 42?
RRB NTPC 06/04/2021 (Evening)
(a) 18 (b) 22 (c) 21 (d) 20

Q.283. Sabiha purchased 240 cups for her shop at Rs. 8 each. During transportation, 24 cups got damaged, and she sold the remaining cups at Rs. 12 each.
Find her overall percentage profit.
RRB NTPC 07/04/2021 (Evening)
(a) 40% (b) 35% (c) 30% (d) 45%

Q.284. If the selling price of an articles is $\frac{5}{4}$ of its cost price, then the profit obtained in the transaction is:
RRB NTPC 08/04/2021 (Morning)
(a) 30% (b) 40% (c) 35% (d) 25%

Q.285. Ram bought five bananas for Rs. 20 and sold them at the rate of three for Rs. 15. Find his gain percentage.
RRB NTPC 08/04/2021 (Morning)
(a) 25% (b) 30% (c) 15% (d) 20%

Q.286. An article is sold to Mr. X at a profit of 20%, Mr. X sells it to Mr. Y at a profit of 25%. If Mr. Y pays Rs. 225 for the article, then what was the cost price for the original seller?
RRB NTPC 08/04/2021 (Evening)
(a) Rs. 275 (b) Rs. 200
(c) Rs. 250 (d) Rs. 150

Q.287. A person incurs a 15% loss by selling an article for Rs. 170. At what price should the article be sold to earn a 10% profit?
RRB NTPC 23/07/2021 (Morning)
(a) Rs. 200 (b) Rs. 420
(c) Rs. 220 (d) Rs. 120

Q.288. The cost price of 12 oranges is equal to the selling price of 9 oranges and the discount on 10 oranges is equal to the profit on 5 oranges. What is the percentage of discount (correct up to 2 decimal places)?
RRB NTPC 23/07/2021 (Evening)
(a) 44.44 (b) 11.11 (c) 16.67 (d) 33.33

Q.289. If the discount and percentage profit are both 20%, then by what percentage is the marked price above the cost price?
RRB NTPC 24/07/2021 (Evening)
(a) 50% (b) 70% (c) 60% (d) 40%

Q.290. The difference between a 12.5% profit and a 10.5% loss, while selling an item, is Rs. 161. What would the selling price of the item be if the intended profit is 19%?
RRB NTPC 24/07/2021 (Evening)
(a) Rs. 817 (b) Rs. 798
(c) Rs. 850 (d) Rs. 833

Q.291. Anupama sold a book at a profit of 10%. Had she sold it for Rs. 20 more, 15% would have been gained. Find the cost price of the book.
RRB NTPC 26/07/2021 (Evening)
(a) Rs. 500 (b) Rs. 375
(c) Rs. 450 (d) Rs. 400

RRB JE
(22/05/2019 to 28/06/2019)

Q.292. A watch is sold at 5% loss. If the cost price had been 20% more and selling price Rs.115 less, there would have been 40% loss. What is the cost price ?
RRB JE 22/05/2019 (Afternoon)
(a) Rs.500 (b) Rs.520
(c) Rs.450 (d) Rs.550

Q.293. What is the gain percent when articles bought at 6 pieces for Rs.5 are sold at 5 pieces for Rs.6 ?
RRB JE 23/05/2019 (Morning)
(a) 30% (b) 44% (c) 33% (d) 25%

Q.294. 'A' sells goods to 'B' at 25% profit for Rs.300. 'B' sells it to 'C' at 10% loss. In this sale, C's cost price is equal to what percent of A's cost price ?
RRB JE 23/05/2019 (Morning)
(a) 87.5% (b) 110% (c) 112.5% (d) 97.50%

Q.295. By how much above cost price should an article be marked so as to gain 17% even after allowing a 22% discount ?
RRB JE 23/05/2019 (Evening)
(a) 45% (b) 28% (c) 35% (d) 50%

Q.296. The cash difference between the selling prices of an article at a profit of 4% and 6% is Rs.3. Find the ratio of the two selling prices.
RRB JE 24/05/2019 (Evening)
(a) 52 : 53 (b) 51 : 52
(c) 51 : 53 (d) 52 : 55

Q.297. An article is sold at a certain price. Had it been sold at 60% of this price, there would have been a loss of 35%. What is the percentage profit now?
RRB JE 25/05/2019 (Morning)
(a) $16\frac{2}{3}$% (b) $12\frac{1}{2}$% (c) 15% (d) $8\frac{1}{3}$%

Q.298. 'A' sells a suitcase to 'B' at 10% profit. 'B' sells it to 'C' at 30% profit for Rs.2860. What is the cost price for 'A' ?
RRB JE 25/05/2019 (Afternoon)
(a) Rs.1000 (b) Rs.1600
(c) Rs.2000 (d) Rs.2200

Q.299. If selling price of 'n' pens is the same as cost price of 10 pens and there is 100% gain, then find the value of 'n'.
RRB JE 27/05/2019 (Morning)
(a) 8 (b) 10 (c) 6 (d) 5

Q.300. Find the difference between the selling prices of two articles sold at 12.5% profit and 12.5% loss, if the cost price is Rs.400 each.
RRB JE 27/05/2019 (Morning)
(a) Rs.140 (b) Rs.120
(c) Rs.80 (d) Rs.100

Q.301. A fruit seller purchased 100 oranges for Rs.80. If 20 of them are rotten, then at what price should he sell the rest of the oranges to have 25% profit per orange ?
RRB JE 27/05/2019 (Evening)
(A) Rs.1.20 (B) Rs.1.25
(C) Rs.1.50 (D) Rs.1

Q.302. Find the cost of production of a table with a retail price of 1265, if the manufacturer makes a profit of 10%, the wholesaler makes a profit of 15% and the retailer makes a profit of 25%.
RRB JE 28/05/2019 (Morning)
(a) Rs. 900 (b) Rs. 850
(c) Rs.750 (d) Rs.800

Q.303. By selling an article, Madan earned a profit equal to one-fourth of the price he bought it. If he sold it for Rs.375, what was the cost price ?
RRB JE 29/05/2019 (Morning)
(a) Rs.312.50 (b) Rs.350
(c) Rs.300 (d) Rs.281.75

Q.304. An article when sold at a gain of 5% yields Rs.15 more than when sold at a loss of 5%. Find its cost price.
RRB JE 31/05/2019 (Afternoon)
(a) Rs.300 (b) Rs.250
(c) Rs.150 (d) Rs.200

Q.305. A house worth Rs.150000 is sold by X to Y at 5% profit. If Y sells the house back to X at 2% loss, then in the entire transaction:
RRB JE 31/05/2019 (Evening)
(a) X gains Rs.3150 (b) X loses Rs.4350
(c) X loses Rs.1350 (d) X gains Rs.4350

Q.306. Two articles are sold for Rs. 840 and Rs.960 at 20% gain and 4% loss respectively. What is the overall gain or loss percent?
RRB JE 01/06/2019 (Afternoon)
(a) $5\frac{5}{17}$% gain (b) $5\frac{15}{17}$% gain
(c) $5\frac{15}{17}$% loss (d) $5\frac{5}{17}$% loss

Q.307. Two articles cost Rs.2500 each. One is sold at 5% profit. On the whole if there is 20% profit, what is the percentage profit on selling the other article ?
RRB JE 01/06/2019 (Evening)
(a) 20% (b) 30% (c) 25% (d) 35%

Q.308. Ravi sold two bicycles at the same price, but gained 20% on one and on the other bicycle lost 20%. Find his profit or loss in the transaction involved.
RRB JE 01/06/2019 (Evening)
(a) Loss of 20% (b) Loss of 4%
(c) Gain of 10% (d) Gain of 20%

Q.309. A discount of 15% on one article is the same as a discount of 20% on another article. Find the cost price of the two articles.
RRB JE 02/06/2019 (Morning)
(a) Rs.60, Rs.40 (b) Rs.40, Rs.20
(c) Rs.70, Rs.50 (d) Rs.80, Rs.60

Q.310. The cost price of 20 tables is equal to the selling price of 'x' tables. If there is a profit of 25%, then what is the value of 'x' ?
RRB JE 02/06/2019 (Morning)
(a) 18 (b) 16 (c) 25 (d) 15

Q.311. Two successive discounts on the labelled price of Rs.6000 reduces the sale price to _____ , if the discounts are 10% and 20% successively.
RRB JE 02/06/2019 (Afternoon)
(a) Rs.4230 (b) Rs.4000
(c) Rs.4200 (d) Rs.4320

Q.312. On selling 17 balls at Rs.720, there is a loss equal to the cost of 5 balls. What is the cost price of a ball ?
RRB JE 02/06/2019 (Afternoon)
(a) Rs.40 (b) Rs.55
(c) Rs.60 (d) Rs.45

Q.313. A man bought apples at the rate of 8 apples for Rs.34 and sold them at the rate of 12 apples for Rs.57. How many apples should be sold to earn a net profit of Rs.45 ?
RRB JE 02/06/2019 (Evening)
(a) 100 (b) 90 (c) 150 (d) 135

Q.314. What is the ratio of selling price to the cost price of an article, if there is a profit of 12% ?
RRB JE 02/06/2019 (Evening)
(a) 28 : 25 (b) 14 : 10 (c) 32 : 25 (d) 12 : 5

Q.315. Ten dozen chocolates are bought at Rs.10 per dozen and sold at Rs.2 per piece. If the trader had to spend Rs.50 on conveyance, what is the profit percentage ?
RRB JE 26/06/2019 (Morning)
(a) 60% (b) 18% (c) 50% (d) 40%

Q.316. Suresh bought an oven at 10% discount on its original price. He sold it at 30% increase on the price he bought it. What was the percentage profit he made on the original price ?
RRB JE 27/06/2019 (Evening)
(a) 27% (b) 20% (c) 32% (d) 17%

Q.317. If the cost price of 24 pens is equal to the selling price of 18 pens, find the profit percent.
RRB JE 28/06/2019 (Evening)
(a) 25% (b) 50% (c) 30% (d) 33.33%

RRB ALP Tier - 2
(21/01/2019 to 08/02/2019)

Q.318. A retailer sells an article for ₹ 486 and makes a profit of 8%. If he had sold the article for ₹ 414, he would have _____.
ALP Tier II 21/01/2019 (Afternoon)
(a) 4% loss (b) 8% loss
(c) 12% loss (d) 10% loss

Q.319. If a shopkeeper sells an article for ₹ 2,700, he makes a profit of 8%. If he sells the article for ₹ 3,000, what will be his profit percentage?
ALP Tier II 23/01/2019 (Morning)
(a) 20 (b) 10 (c) 25 (d) 12

Q.320. A seller buys a certain number of bananas at 8 pieces for ₹ 5 and sells them at 5 pieces for ₹ 8. What will be his percentage profit?
ALP Tier II 23/01/2019 (Afternoon)
(a) 156% (b) 48% (c) 144% (d) 40%

Q.321. If a seller sells a coconut for ₹ 32, he makes a loss of 20%. Find the cost price of the coconut?
ALP Tier II 23/01/2019 (Afternoon)
(a) 36 (b) 44 (c) 48 (d) 40

Q.322. A shopkeeper is expected to make a profit of 50% on his cost price. If in a week, his sales were ₹450, what was his profit?
ALP Tier II 08/02/2019 (Morning)
(a) ₹200 (b) ₹150 (c) ₹180 (d) ₹250

RPF Constable (17/01/2019 to 19/02/2019)

Q.323. The printed price of a book is 700 rupees, the book manufacturer has given a 10% discount on it. If he still earns 20% profit then what will be the cost of books (in rupees)?
RPF Constable 17/01/2019 (Morning)
(a) 515 (b) 525 (c) 535 (d) 545

Q.324. A shopkeeper sells two article at Rs.594 each. In which one article earned a profit of 10% and another one incurred a loss of 10%. Find the overall profit or loss percentage.
RPF Constable 18/01/2019 (Morning)
(a) 4% Loss (b) 1% Loss
(c) 1% Profit (d) 4% Profit

Q.325. A shopkeeper bought one item for 108 rupees and sold it for 135 rupees. Find the percentage of profit.(In%)
RPF Constable 18/01/2019 (Afternoon)
(a) 20 (b) 25 (c) 15 (d) 30

Q.326. One shopkeeper bought an item for 76 rupees and sold it for 57 rupees. Find the percentage of losses.
(In%)
RPF Constable 18/01/2019 (Afternoon)
(a) 15 (b) 20 (c) 10 (d) 25

Q.327. The face value of a book is Rs. 1000. A book seller offers a discount of 10% on this. If he still earns 20% profit then what will be the cost of the book? (In rupees)
RPF Constable 18/01/2019 (Evening)
(a) 740 (b) 750 (c) 760 (d) 770

Q.328. A merchant sells an item at a rate of Rs.336 and earns 12% profit. Find the cost value of that item.
RPF Constable 19/01/2019 (Morning)
(a) Rupee. 300 (b) Rupee. 430
(c) Rupee. 397 (d) Rupee. 350

RPF S.I. (19/12/2018 to 16/01/2019)

Q.329. The loss incurred by selling an article for Rs. 535 is 60% of the profit made by selling the same article for Rs. 775. Find the cost price (in Rs.) of that article.
RPF S.I. 06/01/2019 (Afternoon)
(a) 625 (b) 615 (c) 610 (d) 600

Q.330. A shopkeeper earns 12.5% profit by selling an item at a price of Rs 2,763. Calculate half of the original cost of that item. (In rupees)
RPF S.I. 06/01/2019 (Afternoon)
(a) 1,229 (b) 1,228 (c) 1,226 (d) 1,227

Q.331. If a shopkeeper increases the cost price of an article by 42% and after marking the price it up allows a discount of 42% on its sale, then find the overall percentage gain or loss on it?
RPF S.I. 10/01/2019 (Morning)
(a) Profit of 16.64% (b) Loss of 16.64%
(c) Loss of 17.64% (d) profit of 17.64%

Q.332. Selling an item for 545 rupees is the loss of 60% more than to get the profit obtained by selling the same item at 785 rupees. Know the purchase price of that item? (In rupees)
RPF S.I. 10/01/2019 (Morning)
(a) 645 (b) 635 (c) 615 (d) 625

Q.333. A shopkeeper sells a product at Rs.2736 and earns 12.5% profit. Tell the amount that is equal to half of the purchase price of the product. (In rupees)
RPF S.I. 10/01/2019 (Morning)
(a) 1,216 (b) 1,214 (c) 1,212 (d) 1,218

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.334. To dispose of the old stocks, a person sold a tea set for ₹ 3,420, which was 43% below the cost price. In order to make a profit of 10% the seller should have sold the set for ₹_____ more.
RRB ALP 09/08/2018 (Evening)
(a) ₹ 1,812.60 (b) ₹ 3,180
(c) ₹ 2,580 (d) ₹ 2,664.42

Q.335. The selling price of an item inclusive of a 10% profit was ₹ 440. What would be the percentage loss if the item was sold for ₹ 370?
RRB ALP 10/08/2018 (Morning)
(a) 8 (b) 7.5 (c) 8.4 (d) 6.25

Q.336. If 192 pens cost is ₹10, how many pens can be bought for ₹ 5.
RRB ALP 13/08/2018 (Evening)
(a) 56 (b) 96 (c) 48 (d) 72

Q.337. The prices of chairs and tables are in the ratio of 9:5. If the chairs cost ₹ 4200 more than the tables, Find the price of the tables? (in ₹)
RRB ALP 14/08/2018 (Evening)
(a) 6730 (b) 5250 (c) 5000 (d) 6200

Q.338. If the cost of 17 m of cloth is ₹77 $\frac{5}{7}$ .Find its cost per meter (in rupees)?
RRB ALP 14/08/2018 (Evening)
(a) $4\frac{5}{7}$ (b) $4\frac{4}{7}$ (c) $7\frac{5}{7}$ (d) $5\frac{5}{7}$

Q.339. Junko sold an item for ₹220 at a loss of 12% By how much should she have raised the price to make a profit of 10%?
RRB ALP 17/08/2018 (Evening)
(a) ₹ 55 (b) ₹ 44 (c) ₹ 25 (d) ₹ 48.40

Q.340. The S.P of a washing machine is $1\frac{1}{3}$ of its C.P. Find the gain percent.
RRB ALP 20/08/2018 (Afternoon)
(a) $66\frac{1}{3}$% (b) $33\frac{1}{3}$% (c) 33% (d) 66%

Q.341.A defective piece of article which costs ₹1200 is being sold at a loss at 15%. If the price is further reduced by 5%, find the S.P?
RRB ALP 21/08/2018 (Morning)
(a) ₹960 (b) ₹1000 (c) ₹990 (d) ₹969

Q.342. The price of a Television is ₹14,000 inclusive of VAT. If the rate of VAT is 12%, find the basic price of the Television.
RRB ALP 21/08/2018 (Morning)
(a) ₹13000 (b) ₹12000
(c) ₹12500 (d) ₹13500

Q.343. By selling a used phone for ₹6,160 Rajan got 44% less than what it cost him to buy it a few years ago. At what price should Rajan have been able to sell it to make a profit of 5%?
RRB ALP 30/08/2018 (Morning)
(a) ₹12,550 (b) ₹11,550
(c) ₹12,000 (d) ₹10,550

Q.344. What is the cost price of an article when selling price is ₹ 2592 and the gain is 8%?
RRB ALP 30/08/2018 (Afternoon)
(a)₹2,264 (b) ₹2,200 (c) ₹2,385 (d) ₹2,400

Q.345. By selling an item for ₹696 Unnati incurred a loss of 13% By how much should she have raised the price to gain a profit of 10%?
RRB ALP 31/08/2018 (Morning)
(a) ₹104 (b) ₹84 (c) ₹184 (d) ₹160.08

Q.346. If a person bought an item for ₹ 96 and sold it at a profit of 12.5%, the selling price of the item was:
RRB ALP 31/08/2018 (Morning)
(a) ₹112 (b) ₹105 (c) ₹110 (d) ₹108

Q.347. By selling a table for ₹ 16,870, a shopkeeper suffers a loss of ₹ 1,080. His loss percentage (rounded off to one decimal place) is:
RRB ALP 31/08/2018 (Afternoon)
(a) 6.4% (b) 6.1% (c) 6.0% (d) 6.2%

Q.348. The selling price of an item inclusive of a 16% profit was ₹ 435. What would be the percentage loss if the item was sold for ₹ 330 ?
RRB ALP 31/08/2018 (Afternoon)
(a) 12.5 (b) 12.25 (c) 13 (d) 12

Q.349. A shopkeeper purchased some eggs at ₹ 19.20 per dozen and sold them at a profit of 25% What is the selling price per egg?
RRB ALP 31/08/2018 (Evening)
(a) Rs 2.00 (b) Rs 1.80
(c) Rs 2.20 (d) Rs 1.60

Answer Key :-

1.(c)	2.(c)	3.(a)	4.(b)
5.(d)	6.(d)	7.(c)	8.(d)
9.(b)	10.(a)	11.(b)	12.(d)
13.(b)	14.(b)	15.(c)	16.(b)
17.(d)	18.(a)	19.(b)	20.(a)
21.(b)	22.(a)	23.(d)	24.(c)
25.(d)	26.(b)	27.(b)	28.(a)
29.(a)	30.(b)	31.(b)	32.(c)
33.(b)	34.(d)	35.(a)	36.(b)
37.(d)	38.(d)	39.(b)	40.(b)
41.(c)	42.(a)	43.(b)	44.(d)
45.(d)	46.(a)	47.(a)	48.(d)
49.(a)	50.(a)	51.(a)	52.(b)
53.(c)	54.(d)	55.(d)	56.(b)
57.(a)	58.(a)	59.(a)	60.(a)
61.(d)	62.(c)	63.(d)	64.(c)
65.(a)	66.(c)	67.(c)	68.(d)
69.(c)	70.(b)	71.(a)	72.(b)
73.(a)	74.(c)	75.(d)	76.(c)
77.(d)	78.(a)	79.(c)	80.(c)
81.(b)	82.(d)	83.(c)	84.(a)
85.(c)	86.(d)	87.(c)	88.(a)
89.(a)	90.(d)	91.(d)	92.(c)
93.(a)	94.(c)	95.(b)	96.(a)
97.(a)	98.(c)	99.(b)	100.(b)
101.(d)	102.(a)	103.(c)	104.(c)
105.(a)	106.(b)	107.(c)	108.(a)
109.(a)	110.(d)	111.(b)	112.(a)
113.(d)	114.(b)	115.(b)	116.(c)
117.(a)	118.(a)	119.(b)	120.(c)
121.(d)	122.(a)	123.(c)	124.(d)
125.(c)	126.(d)	127.(c)	128.(d)
129.(d)	130.(b)	131.(a)	132.(c)
133.(b)	134.(d)	135.(d)	136.(b)
137.(a)	138.(b)	139.(b)	140.(a)
141.(c)	142.(c)	143.(d)	144.(c)
145.(b)	146.(b)	147.(a)	148.(a)
149.(b)	150.(a)	151.(c)	152.(c)
153.(c)	154.(c)	155.(b)	156.(a)
157.(d)	158.(c)	159.(d)	160.(a)
161.(c)	162.(d)	163.(a)	164.(a)
165.(c)	166.(b)	167.(c)	168.(d)
169.(d)	170.(a)	171.(b)	172.(d)
173.(c)	174.(d)	175.(a)	176.(c)
177.(c)	178.(b)	179.(b)	180.(c)
181.(a)	182.(d)	183.(a)	184.(a)
185.(c)	186.(d)	187.(a)	188.(b)
189.(c)	190.(d)	191.(c)	192.(b)
193.(a)	194.(b)	195.(a)	196.(c)
197.(b)	198.(d)	199.(d)	200.(a)
201.(b)	202.(b)	203.(a)	204.(c)
205.(d)	206.(c)	207.(d)	208.(d)
209.(b)	210.(b)	211.(b)	212.(c)
213.(a)	214.(c)	215.(d)	216.(d)
217.(d)	218.(b)	219.(a)	220.(d)
221.(d)	222.(b)	223.(d)	224.(d)
225.(b)	226.(c)	227.(c)	228.(a)
229.(b)	230.(c)	231.(c)	232.(b)
233.(c)	234.(c)	235.(d)	236.(a)
237.(c)	238.(d)	239.(b)	240.(d)
241.(c)	242.(a)	243.(d)	244.(b)
245.(b)	246.(d)	247.(b)	248.(d)
249.(a)	250.(a)	251.(b)	252.(d)
253.(c)	254.(d)	255.(a)	256.(c)
257.(c)	258.(a)	259.(a)	260.(c)
261.(d)	262.(d)	263.(c)	264.(c)
265.(a)	266.(b)	267.(c)	268.(b)
269.(c)	270.(a)	271.(c)	272.(a)
273.(c)	274.(d)	275.(d)	276.(d)
277.(c)	278.(a)	279.(d)	280.(a)
281.(c)	282.(d)	283.(b)	284.(d)
285.(a)	286.(d)	287.(c)	288.(b)
289.(a)	290.(d)	291.(d)	292.(a)
293.(b)	294.(c)	295.(d)	296.(a)
297.(d)	298.(c)	299.(d)	300.(d)
301.(b)	302.(d)	303.(c)	304.(c)
305.(a)	306.(b)	307.(d)	308.(b)
309.(d)	310.(b)	311.(d)	312.(c)
313.(b)	314.(a)	315.(a)	316.(d)
317.(d)	318.(b)	319.(a)	320.(a)
321.(d)	322.(b)	323.(b)	324.(b)
325.(b)	326.(d)	327.(b)	328.(a)
329.(a)	330.(b)	331.(c)	332.(b)
333.(a)	334.(b)	335.(b)	336.(b)
337.(b)	338.(b)	339.(a)	340.(b)
341.(d)	342.(c)	343.(b)	344.(d)
345.(c)	346.(d)	347.(c)	348.(d)
349.(a)			

Solution:-

Sol.1.(c) Let the C.P = ₹x
Profit gained at 1920
= loss incurred at 1500
$1920 - x = x - 1500$
$\Rightarrow 2x = 1920 + 1500$
$\Rightarrow 2x = 3420 \Rightarrow x = 1710$
At 10% percent profit, S.P
$= \frac{110}{100} \times 1710 = ₹1,881$

Sol.2.(c)
Let the C.P of each laptop be ₹ x
S.P of 25 laptops $= ₹\frac{112x}{100} \times 25$
and S.P. of 15 laptop $= ₹\frac{120x}{100} \times 15$
S.P of 40 laptops = $₹\frac{118x}{100} \times 40$
Now, $\frac{118x}{100} \times 40 = \left(\frac{112x}{100} \times 25\right) + \left(\frac{120x}{100} \times 15\right) + 30000$
$\Rightarrow \frac{236x}{5} - 28x - 18x = 30000$
$\Rightarrow \frac{236x - 140x - 90x}{5} = 30000$
$\Rightarrow 236x - 230x = 150000$
$\Rightarrow 6x = 150000 \Rightarrow x = 25000$
C.P of each laptop = ₹ 25,000

Sol.3.(a) Cost price for seller 950 gm for ₹ 95 then, C.P for 1 kg = ₹ 100
Profit % = $\frac{50}{1000} \times 100 = 5\%$
His profit for 100 kg rice = 5% of C.P
$= \frac{5}{100} \times 100 \times 100 = ₹500$

Sol.4.(b)

Weigh	Price
984	123
X	100

Actual measure of weight used

$= \frac{984}{123} \times 100 = 800\ gm$

Sol.5.(d) Two successive discounts, overall discount = 25 + 8 - $\frac{25\times8}{100}$ = 31 %

Then C.P = (100 - 31) = 69%

M.P	C.P
117.3	69
1173	690
17	10

7

Required % = $\frac{7}{10} \times 100 = 70\%$

Sol.6.(d) Let the cost price = x

As per the question,

$x \times \frac{128}{100}$ - 18 = $(x + 50) \times \frac{111.6}{100}$

$\Rightarrow \frac{128x}{100} - \frac{111.6x}{100} = 55.8 + 18$

$\Rightarrow \frac{128x-111.6x}{100} = 73.8$

$\Rightarrow \frac{16.4x}{100} = 73.8$

Therefore x = ₹450

Sol.7.(c)

C.P	M.P	S.P
75	100	90
75	100	87.5

Gain% = $\frac{87.5 - 75}{75} \times 100$

= $\frac{12.5}{75} \times 100 = 16\frac{2}{3}\%$

Sol.8.(d)

C.P	M.P	S.P
60	100	75
60	100	80

Profit % = $\frac{80 - 60}{60} \times 100$

= $\frac{20}{60} \times 100 = 33\frac{1}{3}\%$

Sol.9.(b)

He purchased 3 apples of both the varieties.

Total Cost price of 6 apples = 2 + 3 = 5

Now, Selling price of 6 apples = 6

His profit percentage = $\frac{1}{5} \times 100 = 20\%$

Sol.10.(a) Let the cost of 1 banana be x

He purchased 50 dozen banana, then C.P = 50 × 12 × x = 600x

5 dozen banana were spoiled, remaining banana = 600 - 60 = 540

S. P of $\frac{2}{3}$rd banana

= $\frac{2}{3} \times 540 \times \frac{6x}{5} = 432x$

And remaining banana = 540 - 360 = 180

S.P of 180 banana = 180 × $\frac{105x}{100} = 189x$

Total S.P = 432x +189x = 621x

His gain percentage

= $\frac{621x-600x}{600x} \times 100 = 3.5\%$

Sol.11.(b)

Let the C.P of the article be 100 units.

S.P of A = C.P of B = 116 units

S.P of B = C.P of C = 98.6 units

S.P of C = C. P of D = 118.32 units

Profit of C = 118.32 - 98.6 = 19.72 units

Profit of A = 116 - 100 = 16 units

Difference between profit of C and A = 19.72 - 16 = 3.72 units

3.72 units → 248

Loss of B (116 - 98.6) = 17.4 → 1160

Hence, the loss incurred by B = ₹1,160

Sol.12.(d) According to the question,

Y × $\frac{15}{100}$ - X × $\frac{10}{100}$ = 7 ...(1)

Also,

X × $\frac{12}{100}$ + Y × $\frac{5}{100}$ = 10 ... (2)

By subtracting equ. (1) from (2)×3

X = 50 and Y = 80 ,

Now , x + y = 130

Sol.13.(b) Let the price per kg = 100

If profit = 14% then selling price = 114

According to the question,

114 unit = 1000 gm

100 unit = 877.1 gm

So, required weight = 877 gm

Sol.14.(b)

Selling price of rice of one kind = 50

Loss = 20%

Cost price = 50 × $\frac{100}{80}$ = 62.5

Again,

Selling price of another kind of rice = 72

Gain = 20%

Cost price = 72 × $\frac{100}{120}$ = 60

He mixes them in 3 : 2 ratio,

Cost price of mixture

= (62.5 × 3) + (2 × 60) = 307.5

Selling price of mixture

= 64 × (3 + 2) = 320

Profit = 320 - 307.5 = 12.5

Profit percentage

= $\frac{12.5}{307.5} \times 100$ = 4.07% or 4.1%

Sol.15.(c)

CP	:	SP	:	MP
100		128 × $\frac{84}{100}$		128
100		107.52		128

107.52 units = 403.20,

1 unit = 3.75 ⇒ CP = 100 units = 375

Sol.16.(b) $\frac{S.P}{C.P} = \frac{11x}{8x}$

New ratio of S.P and C.P = $\frac{S.P}{C.P} = \frac{7.7x}{7x}$

Now, $11x - 7.7x = 330$

$x = 100$, $C.P$ = ₹800

Required % = $\frac{1000 - 800}{1000} \times 100 = 20\%$

Sol.17.(d) Let the selling price be p

Then Profit of the Lovely who calculates on the selling price = $\frac{25}{100}$ × p

Profit of Bunty who calculates on cost price = p - $\frac{100}{125}$ × p = $\frac{25}{125}$ × p

According to the question Lovely profit is greater so,

$\frac{25}{100}$ × p - $\frac{25}{125}$ × p = 100

$\frac{p}{20}$ = 100 ⇒ P = 2000

Sol.18.(a) We know , 10% = 1/10

A shopkeeper cheats to the extent of 10% while buying as well as while selling.

Ratio 10 : 11

10 : 11

100 : 121

21 % was the gain till then when he was punished.

Sol.19.(b) Let MP = 100

SP = 100 × $\frac{85}{100}$ × $\frac{88}{100}$ = 74.80

CP = $\frac{74.80}{110} \times 100 = 68$

MP : CP = 100 : 68 = 25 : 17

Sol.20.(a) Let the initial SP = 100 units

CP for Anisha = 100×$\frac{4}{5}$ = 80 units

SP for Anisha = 100 + 4 = 104 units

Profit = 104 - 80 = 24 units

Profit % = 24 × $\frac{80}{100}$ = 30%

Sol.21.(b) Let the CP of chair = 100x

And CP of table = 100y

A/Q,

-5x + 15y = 300

$\Rightarrow -x + 3y = 60$ ___(1)

And, 5x + 5y = 180

$\Rightarrow x + y = 36$ __(2)

On solving equation (1) and (2), we get

$x = 12\ and\ y = 24$

CP of table = 100y = 100× $24 = 2400$

Sol.22.(a)

$\frac{1}{3} \times 15 = 5\%, \frac{1}{4} \times 20 = 5\%$

Rest quantity of commodity →

$1 - (\frac{1}{3} + \frac{1}{4}) = \frac{5}{12}$

$\Rightarrow \frac{5}{12} \times 24 = 10\%$

Total profit = 5 +5 + 10 = 20%

A/Q,

20% = Rs. 62

CP = 100% = Rs 310

Sol.23.(d) Ratio between MP and CP = 5 : 3

SP = 3645

Two successive discounts of 25% and 10%

4 : 3

10 : 9

(MP) 40 : 27(SP)

Here , 27 unit = 3645 Rs

So 40 unit = 5400 Rs

Then , 5400 Rs = 5 unit = MP

3 unit = 3240 Rs = CP

Hence , profit % = $\frac{3645 - 3240}{3240} \times 100$

= 12.5%

Sol.24.(c) Overall profit percent = + 10 + 10 + $\frac{10 \times 10}{100}$ = 21%

Sol.25.(d) Quantity of tomatoes bought are 2a and 3a and their prices are 2x and x respectively.

Total cost price → (4ax + 3ax)

C.P. per k.g → $\frac{(4ax + 3ax)}{2a + 3a} = \frac{7ax}{5a}$

= 1.4x ….e.q .(1)

According to question ,

C.P. per k.g. → 17.50 × $\frac{100}{125}$

= 14 ….e.q .(2)

Solving e.q . (1) and e.q . (2) , we get

1.4x = 14 → x = 10

Their prices are 20 Rs. and 10 Rs.

Sol.26.(b)

If S.P. = 1680 Rs. , then loss% = 16%

C.P. = $\frac{1680 \times 100}{84}$ = 2000 Rs.

Now after allowing of 8% discount there is a profit of 15% .

⇒ M.P. = $\frac{2000 \times 115}{92} = \frac{500 \times 115}{23}$

= 2500 Rs.

Sol.27(b) Cost price of 1 bag = Rs.400

Cost price of 18 bag = Rs.7200

After 8% profit, S.P of 18 bags = Rs 7776

Now, overall profit = 16.4%

S.P of 60 bags = $\frac{116.4}{100} \times 60 \times 400$

$= Rs.27936$

S.P for 42 remaining bags = 27936 - 7776 = Rs.20160

S.P of 1 bag = $\frac{20160}{42}$ = Rs.480

Sol.28.(a) Let , the cost price be x and selling price be y ,

Then , Profit = (y − x)

Now, S.P. is doubled and Profit is four times the original .

$4 \times (y - x) = (2y - x) \Rightarrow 2y = 3x$

$\rightarrow \frac{x}{y} = \frac{2}{3}$ Profit% → $\frac{3-2}{2} \times 100 = 50\%$

Sol.29.(a) Let the CP of an item be 100%

ATQ, (20 + 10)% = 30% = ₹57

Then, 130% = $\frac{57}{30}$ × 130 = ₹247

Sol.30.(b) C.P. : S.P.

1st Article ⇒ 10 : 11) × 9 .....(1)

2nd Article ⇒ 10 : 9) × 11 .....(2)

Overall profit or loss % =

$\frac{total\ S.P. - total\ C.P.}{total\ cost\ price} \times 100$

$\frac{198 - 200}{200} \times 100 = -1\%$

− Sign indicates loss%

Short Tricks :-

If Selling price is same for two different article , and profit% , Loss % are same

Then , there will always be loss occurred.

overall loss % = $\frac{P\% \times L\%}{100}$

Here, overall loss % = $\frac{10 \times 10}{100}$ = 1% loss

Sol.31.(b) Cost price = ₹2500

Selling price = ₹ 2375

Loss Percentage = $\frac{CP - SP}{CP} \times 100$

$= \frac{2500 - 2375}{2500} \times 100 = 5\%\ loss$

Sol.32.(c)

Let the C.P of the scooter = ₹100x

Total cost after repairing = ₹110x

S.P = 110x + 2200 and he made a profit of 20% ,

$110x + 2200 = \frac{120}{100} \times 110x$

$\Rightarrow 132x - 110x = 2200$

$\Rightarrow 22x = 2200 \Rightarrow x = 100$

C.P = ₹ 10,000 and repair cost

= $\frac{10}{100} \times 10000 = ₹1000$

Sol.33.(b) Let the C.P of the book = ₹100 x.

Then, S.P = 86x

Now, new S.P = 86x + 100

$86x + 100 = 106x$

$\Rightarrow 106x - 86x = 100$

$\Rightarrow 20x = 100 \Rightarrow x = 5$

So, the C.P of the book = ₹500

Sol.34.(d) Let the price of T.V = ₹x

and the price of printer = ₹ 2x

$2x - x = 35000 \Rightarrow x = 35000$

The C.P of T.V = ₹35,000

Sol.35.(a) C.P of 1 article = ₹1

and S.P of 1 article = ₹ 1.23

Profit % = $\frac{1.23 - 1}{1} \times 100 = 23\%$

Sol.36.(b) 25% profit = $\frac{5}{4}$

30% less weight = $\frac{7}{10}$

4 : 5

7 : 10

28 : 50

Now, profit % = $\frac{50-28}{28} \times 100 = \frac{2200}{28}$

$= 78.57\%$

Sol.37(d) Cost price of the blanket

= 1148 × $\frac{100}{70}$ = ₹1640

Therefore, new selling price

= ₹1640 × $\frac{105}{100}$ = ₹1722

Sol.38(d) Let the CP = 100 units

Selling price = 100 × $\frac{120}{100} \times \frac{95}{100} \times \frac{95}{100}$

=108.3 units

Therefore,

Percentage = $\frac{108.3-100}{100}$ × 100 = 8.3%

Sol.39(b) Let cost price of article = 100x

Profit = 10 % , So selling price = 110x

According to question

110x = 100x + 777.7 ⇒10x = 777.7

So C.P = 100x = 10 × (10x)

= 10 × 777.7 = 7777

Sol.40.(b) C.P of 12 dozen eggs ,

= 12 × 12 × 5 = ₹720

S.P of 11 dozen eggs ,

= 11 × 12 × 6 = ₹792

Profit % = $\frac{792 - 720}{720}$ × 100

= $\frac{72}{720} \times 100 = 10\%$

Sol.41.(c) C.P of A = ₹384

and S.P of A = ₹ 576

Profit% of A = $\frac{576-384}{384} \times 100$

= $\frac{192}{384} \times 100 = 50\%$

C.P of B = ₹ 1254 and S.P of B = ₹ 1672

Profit% of B = $\frac{1672-1254}{1254}$ × 100

= $\frac{418}{1254} \times 100 = \frac{100}{3}\%$

Required ratio = $\frac{50 \times 3}{100} = 3 : 2$

Sol.42.(a) Let the marked price = ₹ 100

S.P after 30% discount = ₹ 70

C.P at 10% profit = $\frac{100}{110} \times 70 = ₹63.63$

Required % = $\frac{100-63.63}{63.63}$ × 100

$= \frac{36.37}{63.63} \times 100 = 57.14\%$

Sol.43.(b) Total cost incurred by Mahesh
= 2000 + $\frac{10}{100} \times 2000$ =2000 + 200
= ₹ 2200
Selling price of the item
= $\frac{115}{100} \times 2200 =$ ₹2530

Sol.44(d) M.P = $\frac{7}{5}C.P$
Let M.P = ₹700 and C.P = ₹500
S.P = $\frac{17}{20}$ M.P = $\frac{17}{20} \times 700 =$ ₹595
Now, profit % = $\frac{595-500}{500} \times 100 = 19\%$

Sol.45.(d) Profit %
= $\frac{40-35}{35}$ × 100 = $\frac{5}{35} \times 100 = 14.28\%$

Sol.46(a) S.P of 12 articles = ₹420
C.P = 12 - 7 = 5 articles
C.P of 1 article = $\frac{420}{5} =$ ₹84

Sol.47(a) S.P of T.V = ₹18700 ,
Loss% = 15%
C.P of the T.V = $\frac{100}{85} \times 18700$
= ₹ 22000
New S.P of T.V = $\frac{115}{100} \times 22000$
= ₹ 25,300

Sol.48(d) C.P = 64% of M.P
C.P : M.P : S.P
64 : 100 : 96
Gain = S.P - C.P = 96 - 64 = 32
Gain% = $\frac{32}{64} \times 100 = 50\%$

Sol.49(a) C.P of 12 pens = ₹150
C.P of 1 pen = ₹12.5
S.P of 1 pen = ₹ 15
Gain % = $\frac{15-12.5}{12.5}$ × 100 ⇒ $\frac{2.5}{12.5} \times 100$
$= 20\%$

Sol.50.(a) Total C.P of 800 apples
= 4800 + 800 = ₹5600
C.P of 1 apple = ₹7
S.P after a profit of ₹ 10 = 7 + 10 = ₹17

Sol.51.(a) Let the C.P of his 100 goods be ₹100
He sold 60 goods at 25% gain, S.P = ₹75
and 40 goods on C.P, S.P = ₹40
Gain % = $\frac{75+40-100}{100}$ × 100
= $\frac{15}{100} \times 100 = 15\%$

Sol.52.(b)
26% above, means 100 : 126
13% discount, means 100 : 87
Overall percentage = 10000 : 10962
Gain % = $\frac{962}{10000} \times 100 = 9.62\%$

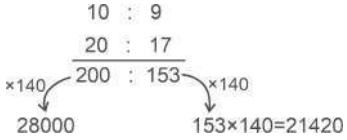
Sol.53.(c)
M.P S.P
5 : 4
20 : 17
25 : 17
Overall discount = $\frac{25-17}{25} \times 100 = 32\%$
S.P of the item = $\frac{68}{100} \times 2000 =$ ₹1,360

Sol.54.(d) Profit = S.P – C.P
$P = S - C$.....(1)
$3P = 2S - C$.....(2)
By subtracting eq . (2) from (1),
$2P = S \Rightarrow P = \frac{S}{2}$
Put the value of P in eq . (1),
$\frac{S}{2} = S - C \Rightarrow C = \frac{S}{2}$
$\frac{S.P}{C.P} = \frac{2}{1}$, Profit % = $\frac{1}{1} \times 100 = 100\%$

Sol.55.(d) C.P of 6 pencils = ₹5
C.P of 30 pencils = ₹25
S.P of 5 pencils = ₹6
S.P of 30 pencils = ₹36
Gain% = $\frac{36-25}{25} \times 100 = 44\%$

Sol.56.(b) Let CP = 100 units
Profit = 260 units
Selling price = 100 + 260 = 360 units
360 units → 7200
100 units → 2000

Sol.57.(a) 10 % = $\frac{1}{10}$ and $15\% = \frac{3}{20}$



Selling price = ₹21,420

Sol.58.(a) Let cost of chair = C,
and cost of table = T
According to the question,
2C + 3T = 1450 .....(1)
T - C = 250 .....(2)
After multiplying equation (2) with 2,
2T - 2C =500 .....(3)
Now, add equation (1) with (3)
2C + 3T = 1450
2T - 2C = 500
5T = 1950
So, cost of table (T) = ₹390

Sol.59.(a) S.P. = 275 × $\frac{95}{100}$
C.P. = 275 × $\frac{95}{100} \times \frac{100}{104.5}$ = ₹250

Sol.60.(a) Let CP = 100 unit
Then, SP = 100 × $\frac{115}{100}$= 115 unit
Marked price = 115 × $\frac{100}{92}$ = 125 unit
Therefore,
required % = $\frac{125-100}{100}$ × 100 = 25%

Sol.61.(d) Let the C.P be ₹100,
then S.P after 18% profit = ₹118
and M.P is same = ₹ 118
Now, after 10% discount,
S.P = $\frac{90}{100} \times 118 =$ ₹106.2
Profit % = $\frac{106.2-100}{100} \times 100 = 6.2\%$

Sol.62.(c) C.P S.P
100 120
X gm 1000 gm
In ₹ 120 → 1000 gm
In ₹ 100 → $\frac{1000 \times 100}{120} = 833.33\ gm$

Sol.63.(d) C.P of 14 fruits = ₹30
S.P of 7 fruits = ₹ 20
then S.P of 14 fruits =₹ 40
Profit % = $\frac{40-30}{30} \times 100 = 33.33\%$

Sol.64.(c) C.P = ₹210 , Gain% = 90%
S.P = $\frac{190}{100} \times 210 =$ ₹399 and before 5% of discount, M.P = ?
Now M.P = $\frac{100}{95} \times 399 =$ ₹ 420

Sol.65.(a) Total C.P of flat
= 550000 + 25000 = ₹5,75,000
S.P of flat = ₹5,37,625
Loss% = $\frac{575000 - 537625}{575000}$ × 100 = 6.5%

Sol.66.(c) Profit at false weight
= $\frac{50}{950}$ ×100 = 5.26%
Profit by selling at M.P = 15%
Overall profit = 15 + 5.26 + $\frac{15 \times 5.26}{100}$
$= 20.26 + 0.789 = 21.049 = 21\frac{1}{19}\%$

Sol.67.(c) S.P of the plot
= $\frac{120}{80} \times 1950000 =$ ₹29,25,000

Sol.68.(d) Cost of production of table = $\frac{100}{112} \times \frac{100}{115} \times \frac{100}{120} \times 15456 =$ ₹10,000

Sol.69.(c) Let the CP of the article = 100 unit So, marked price = 150 unit
SP after discount
= 150 × $\frac{90}{100} \times \frac{75}{100}$ = 101.25 unit

Profit = (101.25 - 100) unit = ₹15 (given)
⇒ 1.25 units = ₹15
Therefore,
CP = 100 units = $\frac{15}{1.25} \times 100$ = ₹1200

Sol.70.(b)

Qnt.	Price	C.P
2	50	100
4	40	160
9	30	270
15		530

S.P = $\frac{130}{100} \times 530 = 689$
S.P per kg = $\frac{689}{15} = ₹45.9/kg$

Sol.71.(a) Total S.P = 960 + 840 = ₹1800
Total C.P = $\frac{100}{96} \times 960 + \frac{100}{120} \times 840$
= ₹1700
Profit = 1800 - 1700 = ₹100

Sol.72.(b) C.P of first article = ₹520,
S.P. of first apple = $\frac{70}{100} \times 520 = ₹364$
C.P of second article = ₹364
New S.P. = $\frac{155}{100} \times 364 = ₹564.2$
Overall profit % = $\frac{564.2-520}{520} \times 100$
= $\frac{44.2}{520} \times 100 = 8.5\%$

Sol.73.(a) S.P of the article = $₹19.50$ $and\ profit\ \% = 30\%$
C.P of the article = $\frac{100}{130} \times 19.50 = ₹15$
New S.P = $\frac{140}{100} \times 15 = ₹21$
Increase in S.P. = 21 - 19.50 = ₹1.50

Sol.74.(c) Let C.P for 1000 gm = ₹1000
Loss = 10% , then
S.P = $\frac{90}{100} \times 1000 = ₹900$
But using false weight , he gains 15%, So
S.P = $\frac{115}{100} \times 1000$
= ₹ 1150(after using false weight)
According to question,
$\frac{1150}{900} = \frac{1000}{x}$
$x = \frac{1000 \times 900}{1150} = 782.6\ gm$

Sol.75.(d) Initial Selling price = ₹ 330
C.P of the article = $\frac{100}{88} \times 330 = ₹375$
Now, new S.P = ₹ 367.50
Loss % = $\frac{375-367.5}{375} \times 100$
= $\frac{7.5}{375} \times 100 = 2\%$

Sol.76.(c) ($66\frac{2}{3}\% = \frac{2}{3}$)
Let the cost of goods = 90 units
ATQ, For $66\frac{2}{3}\%$ of the goods,
SP = $90 \times \frac{2}{3} \times \frac{126}{100}$ = 75.6 units
Remaining goods = $90 - 90 \times \frac{2}{3} = 30$
For 25% of the remaining goods,
SP =$30 \times \frac{1}{4} \times \frac{120}{100}$ = 9 units (25% = $\frac{1}{4}$)
Remaining goods = $30 - 30 \times \frac{1}{4} = 22.5$
For the last remaining goods, SP = $22.5 \times \frac{60}{100}$ = 13.5 units
The total SP = 75.6 + 9+13.5 =98.1 units
Profit percentage = $\frac{98.1-90}{90} \times 100 = 9\%$

Sol.77.(d)
Let the CP of the fan = 100 units
ATQ, marked price of the fan
= $100 \times \frac{122}{100}$ = 122 units
So, SP of the fan
= $122 \times \frac{85}{100}$ = 103.7 units
Profit (103.7 - 100) units = 111
3.7 units = 111
Now, Marked price of the fan
= $\frac{111}{3.7} \times 122 = 30 \times 122 = ₹3660$

Sol.78.(a) According to the question,
$[x \times \frac{85}{100} + 126] \times \frac{125}{100} = 1475$
$\Rightarrow x \times \frac{85}{100} + 126 = 1180$
$\Rightarrow x \times \frac{85}{100} = 1054$
So, x = ₹1240

Sol.79.(c) C.P of 1 kg wheat after mixing
= $\frac{30 \times 13.65 + 20 \times 18.15}{50} = \frac{772.5}{50}$
$= ₹15.45$
S.P after 30% profit
= $\frac{130}{100} \times 15.45 = ₹20$

Sol.80.(c) Let the actual S.P be $12x$
and new S.P be $7x$
After 16 % loss, C.P = $\frac{100}{84} \times 7x = 8.33x$
Again, sold at 80% of actual S.P, Selling price = $\frac{4}{5} \times 12x = 9.6x$
Profit % = $\frac{9.6x - 8.33x}{8.33x} \times 100$
= $\frac{1.27x}{8.33x} \times 100 = 15.24 \approx 15.2\ \%$

Sol.81.(b) Let the C.P of 1 chair = ₹x
and cost of 1 table = ₹y
$3x + 2y = 7000$..... (1)
$5x + 3y = 11000$..... (2)
By solving eq .(1) and (2), we get x = 1000 and y = 2000
Now, the cost of 4 chairs and 2 tables
= 4 × 1000 + 2 × 2000
= 4000 + 4000 = ₹8,000

Sol.82.(d) C.P = ₹4,500 and S.P =₹3,500
Loss = 4500 - 3500 = 1000
and Loss% = $\frac{1000}{4500} \times 100 = 22\frac{2}{9}\%$

Sol.83.(c) Given, C.P = ₹120 ,
after 10% profit S.P = $\frac{110}{100} \times 120 = ₹132$
Since, discount is 4% , then
M.P = $\frac{100}{96} \times 132 = ₹137.50$
Short trick:-
$\frac{CP}{MRP} = \frac{96}{110}$
96 unit → Rs. 120 (given)
110 unit → $\frac{120}{96} \times 110 = ₹137.50$

Sol.84.(a)
SP on 25% profit = $5000 \times \frac{125}{100}$ = ₹6,250

Sol.85.(c) 30% = $\frac{3}{10}$

ATQ,	CP	:	SP
	10	:	13
	10	:	13
	100	:	169

Profit % = $\frac{69}{100} \times 100 = 69\%$
Alternet method:
Required profit %
= $30 + 30 + \frac{30 \times 30}{100} = 69\%$

Sol.86.(d) Let the cost of apples and grapes be A and G per kg respectively.
ATQ,
2A + 2G = 160 (by multiplying with 3)
6A + 6G = 480 ....(1)
4A + 3G = 300 (by multiplying with 2)
8A + 6G = 600 .....(2)
Now, by subtracting equation (1) from (2)
8A + 6G = 600
6A + 6G = 480
2A = 120
Therefore rate of apple (A) = ₹60 per kg

Sol.87.(c) CP of first battery
= $650 \times \frac{100}{130}$ =500
Then profit = 650 - 500 =150
Loss on second battery
= $950 \times \frac{100}{95} = 1000$
Loss = 1000 - 950 = 50
Required % = $\frac{150-50}{1500} \times 100$

$= \frac{100}{1500} \times 100 = 6\frac{2}{3}\%$ gain

Sol.88.(a) The mark price

$=1500 \times \frac{120}{100} \times \frac{100}{80} = ₹2250$

Sol.89.(a) CP of 1 mango $= \frac{900}{12} = ₹75$

SP of 1 mango $= \frac{1200}{9} = ₹\frac{400}{3}$

Required % $= \frac{\frac{400}{3} - 75}{75} \times 100$

$= \frac{175}{75 \times 3} \times 100 = 77\frac{7}{9}\%$

Sol.90.(d) Cost price for the person
= 250000 + 30000 = ₹280000
So profit percentage
$= \frac{350000 - 2800000}{280000} \times 100 = 25\%$

Sol.91.(d)

Required percentage $= \frac{200}{800} \times 100 = 25\%$

Sol.92.(c) Selling price of 25 article without discount $= 45 \times \frac{100}{90} = ₹50$

Cost price of 25 article $= 45 \times \frac{100}{150} = ₹30$

So required percentage
$= \frac{50-30}{30} \times 100 = 66.67\%$

Sol.93.(a) C.P = ₹3,200 and S.P = ₹4,700
Profit = 4700 - 3200 = ₹1500

Profit% $= \frac{1500}{3200} \times 100 = 46\frac{7}{8}\%$

Sol.94.(c) Let S.P be ₹x and profit ₹ $\frac{x}{5}$

C.P $= x - \frac{x}{5} = \frac{4x}{5}$

Now, S.P : C.P = 5 : 4
Let S.P and C.P be ₹500 and ₹400

New S.P $= \frac{104}{100} \times 500 = ₹520$

New C.P $= \frac{110}{100} \times 400 = ₹440$

Profit % $= \frac{520-440}{440} \times 100$

$= \frac{200}{11} = 18.18\%$

Sol.95.(b) Selling price of the table

$= \frac{70}{100} \times 2800 = ₹1960$

Sol.96.(a) 60% of S.P = 80% of C.P

$\frac{3}{5} \times S.P = \frac{4}{5} \times$ C.P

Then, $\frac{S.P}{C.P} = \frac{4}{3}$

Profit % $= \frac{1}{3} \times 100 = 33\frac{1}{3}\%$

Sol.97.(a) Cost price of the article

$= \frac{100}{91} \times 1820 = ₹2000$

Selling price of the article

$= \frac{100+9}{100} \times 2000 = ₹2,180$

Sol.98.(c) His profit %

$= \frac{1000 - 850}{850} \times 100$

$= \frac{150}{850} \times 100 = 17.65\%$

Sol.99.(b)

C.P	M.P	S.P
100	110	$\frac{95}{100} \times \frac{95}{100} \times 110$
100	110	99.275

His loss% $= \frac{0.725}{100} \times 100 = 0.725\%$

Sol.100.(b) Total S.P = 2 × 20,000
= ₹40,000

C.P of first article $= \frac{100}{115} \times 20000$

= ₹17391.30

C.P of second article $= \frac{100}{85} \times 20000$

= ₹ 23529.40
Total C.P = 17391.30 + 23529.40
= ₹40920.70
Overall loss = 40920.70 – 40000 ≈ ₹921

Sol.101.(d) C.P. of Ramesh = Rs. 4000
S.P. of Ramesh = C.P. of Mohan

$= \frac{4000 \times 110}{100}$ = Rs.4400

Total C.P. of Mohan after spending Rs.500 on it is Rs.4900
S.P. of Mohan = C.P. of Ritwik

$= \frac{4900 \times 112}{100}$ = Rs. 5488

Sol.102.(a) Let the shopkeeper purchase . 1 kg of wheat.
C.P of 1 kg wheat = ₹18
Since, he gives only 900 gm, so C.P of 900 gm wheat $= \frac{18 \times 900}{1000} = ₹16.2$

S.P of 1 kg wheat =₹ 20

Actual profit % $= \frac{20-16.2}{16.2} \times 100$

$= \frac{3.8}{16.2} \times 100 = 23.45\%$

Sol.103.(c) Cost of 70 kg of onions =₹ 560
Then, cost of 1 kg of onions = ₹ 8
S.P of 1 kg of onions = ₹ 10

His profit % $= \frac{10-8}{8} \times 100 = 25\%$

Sol.104.(c) Let the C.P of 1 kg = ₹1000
S.P of 1 kg = ₹800
But, the shopkeeper cheats and uses 40% less weight than the original weight.
So, the C.P of 600 gm = ₹600

Now, profit % $= \frac{800-600}{600} \times 100$

$= \frac{200}{600} \times 1000 = 33.33\%$

Short trick ⟹ 20%= $\frac{1}{5}$ & 40% = $\frac{2}{5}$

C.P	:	S.P
5	:	4
3	:	5
15	:	20 or 3 : 4

Now, profit % $= \frac{1}{3} \times 100 = 33.33\%$

Sol.105.(a) Given, S.P = 840

Then, C.P $= \frac{100}{80} \times 840 = ₹1050$

Now, to get 25% percent profit SP

$= \frac{125}{100} \times 1050 = ₹1312.50$

Sol.106.(b) Selling price = 540
and Loss = 10%

Cost price = $540 \times \frac{100}{90} = 600$

Selling price = 696

Profit percent $= \frac{696-600}{600} \times 100 = 16\%$

Sol.107.(c) Selling price for Ashish = 5,000,
Cost price for Bipin = 5,000
Loss = 20% and Cost price for Ashish

$= 5{,}000 \times \frac{100}{80} = 6250$

Selling price of Bipin at 15% profit = $6250 \times \frac{115}{100} = 7187.5$

Bipin's gain in this transaction = 7187.5 - 5000 = 2187.5

Sol.108.(a) Selling price = 30875
Loss = 5%
95 unit of C.P= 30875

107 unit $= \frac{30875}{95} \times 107 = 34{,}775$

So, required selling price = 34,775

Sol.109.(a) Let the cost price = 100
Marked price = 130 , Discount = 20%

Selling price $= 130 \times \frac{80}{100} = 104$

Gain = 104 - 100 = 4

Percentage gain $= \frac{4}{100} \times 100 = 4\%$

Short tricks :-

gain % = markup% - discount% - $\frac{markup\% \times discount\%}{100}$

gain %= 30% - 20% - $\frac{30\% \times 20\%}{100} = 4\%$

Sol.110.(d) Let the cost price = 100
Profit = 10% and Selling price = 110
Discount = 10%

Marked price = 110 × $\frac{100}{90}$ = 122.22%

So, required percentage = 22.22%

Sol.111.(b) Marked price = 150

Discount = 20% and Profit = 25%

Selling price = 150 × $\frac{80}{100}$ = 120

Cost price = 120 × $\frac{100}{125}$ = 96

Sol.112.(a) Cost price of the Bluetooth device = $\frac{100}{110} \times 1540 = ₹1,400$

Sol.113.(d)

The cost price of the article = ₹1200

After a profit of 15%, S.P

= $\frac{115}{100} \times 1200 = ₹1,380$

He also wants to give a discount of 10% ,

So, his marked price of the article should be = $\frac{100}{90} \times 1380 = ₹1,533$

Sol.114.(b) C.P of the car for Aman = ₹8,00,000

Amount paid by Anil

= $800000 \times \frac{105}{100} \times \frac{96}{100} = ₹8,06,400$

Sol.115.(b) Cost price of 1 kg pulse = Rs.80

Selling price of 1 kg pulse = Rs.100

First profit percentage

= $\frac{20}{80} \times 100 = 25\%$

But, He cheats and gives only 800 gm instead of 1 kg.

So, again profit percentage

= $\frac{200}{800} \times 100 = 25\%$

Now, overall profit = 25 + 25 + $\frac{25 \times 25}{100}$

$= 50 + 6.25 = 56.25\%$

Sol.116.(c) Let the cost price = 100 unit

Profit = 23% and Selling price = 123 unit

Profit = 23 unit

According to the question,

23 unit = 1840

100 unit = 8000

Cost price = 8000, Profit = 1840

Selling price = 8000 + 1840 = 9840

Discount = 18%

Marked price = 9840 × $\frac{100}{82}$ = 12,000

Sol.117.(a) Cost price of each = ₹7

Cost price of 12 apples = 84

Selling price of 12 apples = 96

Profit = 96 - 84 = 12

Profit percentage = $\frac{12}{84} \times 100 = 14\frac{2}{7}\%$

Sol.118.(a) Let the Cp of horse be 100x

He sold horse at 7% loss then the Selling price is 93x

If he had sold at 9% profit then Selling price would be 109x

Then he would have got Rs. 6400 more

Then , difference between the Selling Price in two case will be

= 109x - 93x = 16x

16x = 6400 ⇒ X = 400

Then Cost price of horse is Rs.40000

Sol.119.(b) gain percent

= $\frac{1000-950}{950}$ × 100

= $\frac{50}{950} \times 100 = 5\frac{5}{19}\%$

Sol.120.(c) Let the C.P = 100 units

Then, at $6\frac{1}{4}\%\ loss$, S.P = $\frac{375}{4}$ units

Dishonest seller actually gives 14 gm of goods instead of 16 gm.

C.P	:	S.P
$\frac{100}{16}$	:	$\frac{375}{4\times14}$
14	:	15

Profit percentage = $\frac{1}{14} \times 100 = 7\frac{1}{7}\%$

Sol.121.(d)

Marked price of the jacket = ₹1050

S.P after a discount of 10%

= $\frac{90}{100} \times 1050 = 945$

Now, he still earns a profit of 25% ,

Then, C.P = $\frac{100}{125} \times 945 = 756$

Hence, the shopkeeper purchased it in ₹756

Short trick:

$\frac{M.R.P}{C.P} = \frac{125}{90}$

125 unit = 1050 (M.R.P given)

C.P = $\frac{1050}{125} \times 90 = 756$

Sol.122.(a)

$S.P\ of\ 15\ articles = C.P\ of\ 20\ articles$

$\frac{S.P}{C.P} = \frac{20}{15}\ or\ \frac{4}{3}$

Gain % = $\frac{1}{3} \times 100 = 33\frac{1}{3}\%\ gain$

Sol.123.(c) Marked price = ₹4,500 and discount % = 4.2%

Then S.P = $\frac{95.8}{100} \times 4500 = ₹4,311.00$

Sol.124.(d) Let the cost of a mouse be ₹x and cost of a keyboard be ₹7x

$x + 7x = 3600$

$\Rightarrow 8x = 3600 \Rightarrow x = 450$

Hence, the cost of keyboard

= 7x = ₹3,150

Sol.125.(c)

Let the cost of the house be x, then the cost of the garden be $\frac{5x}{12}$.

$x + \frac{5x}{12} = 51,00,000$

$\Rightarrow \frac{17x}{12} = 51,00,000$

$\Rightarrow x = 36,00,000$

Hence, the cost of the garden

= $\frac{5x}{12} = 15\ lakh$

Sol.126.(d) C.P of the article = 800

Then S.P = $\frac{85}{100} \times 800 = ₹680$

Sol.127.(c) Given, S.P of the sewing machine = 19,440

C.P = $\frac{100}{108} \times 19440 = 18,000$

Sol.128.(d) M.P × $\frac{100 - discount}{100}$ = S.P.

S.P. = 2,850 × $\frac{79}{100}$ = 2,251.50

Sol.129.(d)

Let the C.P of 1000 gm = ₹1000

S.P of 1000 gm = ₹1250

But, the trader claims a 15% less weight ,

So, C. P of 850 gm = ₹850

So, overall profit

= $\frac{1250-850}{850} \times 100 = \frac{400}{850} \times 100 = 47\%$

Sol.130.(b) Cost of 100 eggs = ₹100

And, 12 eggs broke in transit.

So, Cost of 88 eggs = ₹100

Then, S.P of 88 eggs = 88 × 1.2 = ₹105.6

Hence, profit % = $105.6 - 100 = ₹5.60$

Sol.131.(a) S.P of the car = ₹1,64,000

Then, C.P = $\frac{100}{80} \times 164000 = ₹2,05,000$

Sol.132.(c) Price of barley at 15% profit

= 5000 × $\frac{115}{100}$ = ₹ 5750

Therefore total profit

= 5750 - 5000 = ₹ 750

ATQ,

He sold half of barley at 20% profit

Then profit = 2500 × $\frac{20}{100}$ = ₹ 500

Remaining profit i.e 750 - 500 = ₹ 250 will be at price of remaining half of barley

Therefore selling price

= 2500 +250 = ₹ 2750

Sol.133.(b)

Since, selling price is same for both

	CP		SP	
Table →	25	:	27	.. × 23
Swing →	25	:	23	.. × 27

After balancing the ratio for SP

CP	SP

Table → 575 : 621
Swing → 675 : 621
Total → 1250 : 1242

Therefore, required % = $\frac{8}{1250} \times 100$

= 0.64% loss

Alternate method :

If two article are sold for same price and one of them sold at X% profit and another sold for x% loss

Than there are always $(\frac{x}{100})$% loss will occur.

So, loss percentage = $(\frac{x}{100})$% = 0.64%

Sol.134.(d) Profit = 20%

Second profit = $\frac{1000-900}{900} \times 100 = 11\frac{1}{9}$

20% ⇒ 5 : 6

$11\frac{1}{9}$% ⇒ 9 : 10

45 : 60

Actual profit percentage

= $\frac{60-45}{45} \times 100 = 33.33\%$

Sol.135.(d) Selling price = 15,000

Profit = 15000 × $\frac{1}{5}$ = 3000

Cost price = 15,000 – 3,000 = 12,000

Profit percentage

= $\frac{Profit}{Cost\ price} \times 100 = \frac{3000}{12000} \times 100 = 25\%$

Sol.136.(b)

Initial profit = $\frac{27-25}{25} \times 100 = 8\%$

Profit in weight

= $\frac{1000-800}{800} \times 100 = 25\%$

Actual profit percentage

= 8 + 25 + $\frac{8 \times 25}{100}$ = 35%

OR

CP of 1000 kg potatoes = 25 ₹

To calculate profit or loss, quantity must be same.

⇒ CP of 800 kg potatoes = 20₹

SP of 800 kg potatoes = 27 ₹

Now , Profit % = $\frac{SP-CP}{CP} \times 100$

= $\frac{27-20}{20} \times 100 = 35\%$

Sol.137.(a) Let the cost price = 100 unit

Selling price at 15% loss = 85 unit

New cost price = 95 unit

New selling price

= 95 × $\frac{110}{100}$ = 104.5 unit

Difference in selling price

= 104.5 - 85 = 19.5 unit

According to question,

19.5 unit = 195 → 100 unit = 1000

So, required cost price = 1,000

Sol.138.(b) Cost of camera = 25,000

Cost of leather case = 2,750

Total cost price = 25000 + 2750 = 27750

Selling price = 26085

Loss = 27750 - 26085 = 1665

Loss percentage = $\frac{1665}{27750} \times 100 = 6\%$

Sol.139.(b) Make quantity equal,

	Banana	Rs.
CP	8	25.....× 3
SP	6	20.....× 4

Profit = 80 - 75 = 5

Profit percentage = $\frac{5}{75} \times 100 = 6\frac{2}{3}\%$

Sol.140.(a)

Price per kg of rice = $\frac{1710}{38}$ = 45

Let the selling price per kg = x

According to the question,

1710 + 8x = 38x

30x = 1710 ⇒ x = 57

Selling price of 5 kg = 5 × 57 = 285

Sol.141.(c)

If selling price of milk per litre = ₹50 then Loss = 2000

If selling price of milk per litre = ₹60 then profit = 1500

Let the total quantity of milk = x liter

According to the question,

50x + 2000 = 60x - 1500

10x = 3500 ⇒ x = 350 liter

Sol.142.(c)

Cost price × 63 = 54 × selling price

$\frac{Cost\ price}{Selling\ price} = \frac{54}{63}$

Profit = 63 - 54 = 9

Percentage gain

= $\frac{9}{54} \times 100 = 16.66\%$ or $16\frac{2}{3}$%gain

Sol.143.(d)

Cost price of each unit = $\frac{550}{50}$ = 11

Cost price of 10 article = 11 × 10 = 110

Selling price of 10 article,

= 110 × $\frac{90}{100}$ = 99

Selling price of remaining at 20% on the whole transaction = 550 × $\frac{120}{100}$ = 660

Selling price of remaining

= 660 – 99 = 561

Selling price per unit = $\frac{561}{40}$ = 14.025

Sol.144.(c) Let the price per kg = 1

Profit percentage

= $\frac{250-200}{200} \times 100 = 25\%$

Sol.145.(b)

Let cost price of 1 kg apple = ₹ A

And, cost price of 1 kg of orange = ₹ O

3A + 4O = 210.....(i)

5A + 2O = 175.....(ii) × 2

On solving,

10A + 4O = 350

3A + 4O = 210

_____

7A = 140 ⇒ A = 20

So, Cost of 1 kg apples = ₹20

Sol.146.(b) According to the question,

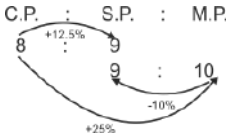
MP × $\frac{90}{100}$ = CP × $\frac{112.5}{100}$ ⇒ $\frac{MP}{CP} = \frac{5}{4}$

If we take MP as SP, then

Profit % age = $\frac{5-4}{4} \times 100 = \frac{1}{4} \times 100$

= 25%

Short Tricks :-



Sol.147.(a) Let MP = 100

Effective discount rate = 16 + 20 – $\frac{16 \times 20}{100}$ = 36 – 3.2 = 32.8%

According to the question,

₹3,024 corresponds to (100 – 32.8) = 67.2%,

So MP = $\frac{3024 \times 100}{67.2}$ = ₹4,500

MP : CP = 5 : 3 (given)

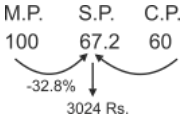
So, CP = $\frac{3}{5} \times 4500$ = ₹2,700

SP = 4500 × $\frac{100 - 32.8}{100}$ = 4500 × $\frac{67.2}{100}$

= ₹3,024

So, profit (in ₹) = 3024 – 2700 = ₹324

Short Tricks :-



Successive of 16% and 20%

= 16 + 20 – $\frac{16 \times 20}{100}$ = 32.8%

67.2 units = 3024 Rs.

Profit = 7.2 units = 324 Rs.

Sol.148.(a)

Cost price for A = 12300 + 200 = 12500

Cost price for B = $12500 \times \frac{110}{100}$ = 13750

Cost price for C = 13750 × $\frac{106}{100}$ = 14575

Marked price by C = 14575 + 2915 = 17490

Selling price by C = 17490 × $\frac{90}{100}$

= 15741

Profit earned = 15741 - 14575 = ₹1166

Sol.149.(b)

$$\frac{Articles1 \times percentage\ value1}{Amount1} = \frac{Articles\ 2 \times percentage\ value\ 2}{Amount2}$$

$\frac{8 \times 75}{75} = \frac{x \times 124}{372}$ ⇒ x = 24 pens

Sol.150.(a) Total cost price = 30 × 30 + 40 × 28 = 2020
Total selling price = (30 + 40) × 28 = 1960
Loss = 2020 - 1960 = 60
Percentage loss = $\frac{60}{2020} \times 100$
= 2.97% or 3%

Sol.151.(c) Let the cost price = 100
Loss = 30%
Selling price at 30% loss = 70
Selling price at 16% profit = 116
As per question,
70% = 1729 ⇒ 116% = 2865.20
So, required selling price = ₹2865.20

Sol.152.(c) Selling price = 211.20
Loss = 12%
Cost price = 211.20 × $\frac{100}{88}$ = 240
New selling price = 248.40
Profit = 248.40 - 240 = 8.40
Profit percentage = $\frac{8.4}{240} \times 100$ = 3.5%

Sol.153.(c) Let the cost price = 100
Profit = 74%
Selling price = 174
New cost price = 150
New profit = 174 - 150 = 24
Profit percentage = $\frac{24}{150} \times 100$ = 16%

Sol.154.(c) 18% = 9/50
MP : SP = 50 : 41
As per question,
41 unit = 123 ⇒ 50 unit = 150
So, marked price = 150
25% = 1/4
CP : SP = 4 : 5
As per question,
5 unit = 150 ⇒ 4 unit = 120

Sol.155.(b) Difference between 12% gain and 4% loss = 16%
As per question,
16% = 28 ⇒ 100% = 175

Sol.156.(a) $66\frac{2}{3}\% = \frac{2}{3}$
CP : SP = 3x : 5x
Let the CP of the other article = 5x - 400
Total cost price = 3x + 5x - 400 = 8x - 400
As per question,
(8x - 400) × $\frac{150}{100}$ = 5x + 5x
24x - 1200 = 20x ⇒ 4x = 1200 ⇒ x = 300
Selling price of each article = 5x
= 5 × 300 = 1500

Sol.157.(d) Expenditure on repairs
= 5500 × $\frac{12}{100}$ = 660
Total cost price = 5500 + 660 = 6160
Loss = 5%
Selling price = 6160 × $\frac{95}{100}$ = ₹5852

Sol.158.(c) Let the C.P of the item be ₹x

$\frac{108x}{100} - \frac{87x}{100} = 115.50$

$\frac{21x}{100} = 115.50 \Rightarrow x = ₹550$

Sol.159.(d) C.P

$= \frac{500 \times 9 + 720 \times 5 + 900 \times 11}{9 + 5 + 11}$

$= \frac{18000}{25} = ₹720 \Rightarrow S.P = \frac{720 \times 6}{5}$

$= ₹864$

Sol.160.(a) C.P of 120 m cloth = ₹15000
C.P of 1 m cloth = ₹125
He sold (45% of 120)=54 m cloth at 40% gain, S.P = $54 \times \frac{140}{100} \times 125 = ₹\ 9450$
Now,S.P of (25% of 120) = 30 m cloth at 10% loss = $30 \times \frac{90}{100} \times 125 = ₹\ 3375$
Remaining cloth = 120 - (54 + 30) = 36 m
S.P of 36 m cloth = 36 × 125 = ₹ 4500
Now, overall profit = 9450 + 3375 + 4500 - 15000 = 17325 - 15000 = ₹ 2325

Sol.161.(c)
Let the C.P of the article be 100 unit
S.P of the article = 120 unit
Now,C.P is decreased by 10% → 90 unit
At this new C.P, he made a profit of 40%;
New S.P = $\frac{140}{100} \times 90 = 126$ unit
Profit = 126 - 120 = 6unit
$6\ unit \rightarrow 18\ (given)$
1 unit → 3 ⇒ 100 unit → 300
Hence, the original C.P = ₹ 300

Sol.162.(d) Let the C.P of A be ₹x and C.P of B be ₹ (2312 - x).
Now, $\frac{100 - 16}{100} \times x$
$= \frac{100 + 20}{100} \times (2312 - x)$
$\Rightarrow \frac{84x}{100} = \frac{120}{100} \times (2312 - x)$
$\Rightarrow 7x = 23120 - 10x$
$\Rightarrow 17x = 23120 \Rightarrow x = 1360$
Difference in C.P = 1360 - (2312 - 1360)
= 1360 - 952 = ₹408

Sol.163.(a) 60% gain means ; $\frac{C.P}{S.P} = \frac{5}{8}$
C.P of 15 lemons = $\frac{5}{8} \times S.P$
$= \frac{5}{8} \times 3 = \frac{15}{8}$
In $\frac{15}{8}$ rupee .....15 $lemons\ can\ be\ bought$.
In 1 rupee ..... $15 \times \frac{8}{15} = 8\ lemons$

Sol.164.(a) C.P of the washing machine = 8000 + 500 = ₹8,500
S.P of the washing machine
$= \frac{120}{100} \times 8500 = ₹10,200$
This S.P becomes her new C.P = ₹10,200
Now, S.P = $\frac{90}{100} \times 10200 = ₹9,180$
Overall profit = 9180 - 8500 = ₹680

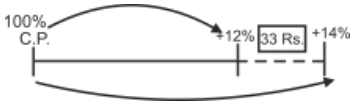
Sol.165.(c) 30% profit means;
$\frac{S.P}{C.P} = \frac{13}{10};\ Now\ new\ ratio$
$\frac{S.P}{C.P} = \frac{13 \times 110}{10 \times 125} = \frac{1430}{1250}$
New profit% = $\frac{1430 - 1250}{1250} \times 100$
$= \frac{180}{1250} \times 100 = 14.4\%$

Sol.166.(b) S.P = ₹222 and Loss = ₹ 48
Then C.P =. 222 + 48 = ₹ 270
Loss% = $\frac{48}{270} \times 100 = 17\frac{7}{9}\%$

Sol.167.(c) As we know,
$\frac{CP}{MP} = \frac{100 - D}{100 + P}$ [where CP = cost price, MP = marked price, D = discount, P = profit]
$\Rightarrow \frac{75}{100} = \frac{100 - 15}{100 + P}$
$\Rightarrow 3P = 400 - 300 - 60$
$\Rightarrow P = 13.33$ [(+) i.e. profit]
So, the profit percentage is 13.33%.

Sol.168.(d) Here the article was sold at a gain of 12%. Had it been sold for Rs. 33 more, the gain would have been 14%. So, (14 - 12)% = 33
2% 33
So, 100%..... $\frac{33}{2} \times 100 = 1650$ = CP

Short Tricks :-



Here , 2% = 33 Rs.
Then , C.P. (100%) = 1650 Rs.

Sol.169.(d) A shopkeeper loses 10% on selling an article for Rs 360
So, cost price of the article = $\frac{100}{90} \times 360$
= 400 Rs.

To gain 30%, the selling price of the article should have been = $\frac{130}{100} \times 400$
= 520 Rs.

Sol.170.(a) By selling an article for ₹138, a shopkeeper losses 8%
the cost price of the article = $\frac{100}{92} \times 138$
= ₹150
So, to get a gain of 4% the article should be sold at = $\frac{104}{100} \times 150$ = ₹ 156

Sol.171.(b) Total selling price of the two toys = 990 × 2 = 1980
Cost price of the toy which is sold at 10% profit = $\frac{100}{110} \times 990 = 900$
Cost price of the toy which is sold at 10% loss = $\frac{100}{90} \times 990 = 1100$
So, total cost price = 900 + 1100 = 2000
So, the overall percentage loss = $\frac{2000-1980}{2000} \times 100$ = 1% loss

Sol.172.(d) As we know, $\frac{MP}{CP} = \frac{100+P}{100-D}$
[where MP= marked price, CP= cost price, P= profit percentage, D= discount percentage]
$\Rightarrow \frac{MP}{500} = \frac{100+8}{100-20} \Rightarrow \frac{MP}{500} = \frac{108}{80}$
$\Rightarrow MP = 25 \times 27 = 675$
i.e.
the marked price of the article is 675 Rs.

Sol.173.(c) By selling an article for Rs 45,000 a man loses 10%
= Cost price = $\frac{100}{90} \times 45000$ = Rs.50,000
Now, to gain 15% the selling price should be = $\frac{115}{100} \times 50000$ = 57500Rs.

Sol.174.(d) CP of the car = 1,20,000 × $\frac{100}{120}$ =1,00,000
Now, when profit = 30%,
SP =1,00,000 × $\frac{130}{100}$ = 1,30,000

Sol.175.(a) As the shopkeeper incurs a loss of 20% afler selling a machine for 4800,
the cost of the machine is = $\frac{100}{80} \times 4800$
= 6000
So, in order to gain a profit of 20%, the shopkeeper should sell the same machine at
= 6000 × $\frac{120}{100} = 7200$

Sol.176.(c) As Shakila incurs a loss of 10% after selling a machine part for 540,
The cost of the machine part is = $\frac{100}{90} \times 540 = 600$
So, in order to gain a profit of 10%, Shakila should sell the same machine part at
= 600 × $\frac{110}{100} = 660$ Rs.

Sol.177.(c) 4% = 1800 - 1750 = 50
Cost price is 100%
∴ CP = $\frac{50}{4} \times 100$ = Rs 1,250

Sol.178.(b) effective percentage difference = {5 - (-5)}% = 10% is equivalent to 50 Rs.
⇒ Cost price (100%) is equivalent to = $\frac{50}{10} \times 100 = 500$
So, the original selling price is = $\frac{105}{100} \times 500 = 525$Rs.

Sol.179.(b) Let the CP of watch = 100
In 1st case, Loss = 10% = 10
SP_1 = 100 - 10 = 90
In 2nd case, Profit = 4% = 4
SP_2 = 100 + 4 = 104
Difference of SP = 104 - 90 = 14, which is equal to Rs140
CP = $\frac{140}{14} \times 100$ = Rs 1000

Sol.180.(c) Let the CP = 100
If loss = 15%, SP = 85
For Profit = 15% , SP= 115
SP = $\frac{1785}{85} \times 115$ = Rs 2,415

Sol.181.(a) CP of oranges = 20 × 45 = 900
SP = 18.5 × 54 + 1.5 × 10
= 999 + 15 = 1014
Profit = 1014 - 900 = 114
Profit % = $\frac{114}{900} \times 100 = 12\frac{2}{3}\%$

Sol.182.(d) CP of machine = 70,000
15% of 70,000 = 10,500
New CP = 70,000 - 10,500 = 59,500
Overhead exp. = 5,000
Total CP = 59,500 + 5000 = Rs. 64,500
SP = $\frac{64500}{100} \times 115$ = Rs 74,175

Sol.183.(a) Let the CP of the article = 100
Loss = 10% = 10
SP = 100 - 10 = 90
For P = 15% , SP = 115
SP = $\frac{2340}{90} \times 115$ = Rs 2,990

Sol.184.(a)
The CP for Montoo = 150000 × $\frac{105}{100}$
= 1,57,500
SP of Montoo = 157500 × $\frac{98}{100}$
= 1,54,350
Profit of Raju = 157500 - 154350
= Rs 3,150

Short Tricks:-
Net profit / Loss % change = $(a + b + \frac{ab}{100})$
Here, Net change = +5 -2 - $\frac{5 \times 2}{100}$ = 2.9%
…….. (+ indicate profit)
100% = 150000
Then 2.9% = 4350

Sol.185.(c) Discount = 25% = $\frac{1}{4}$ and Profit = 12% = $\frac{3}{25}$

CP	SP	MP
25	28	
	3	4

25 × 3 : 28 × 3 : 28 × 4
75 : 84 : 112
MP - CP = 112 - 75 = 37
% of Diff. = $\frac{37}{75} \times 100 = \frac{148}{3} = 49\frac{1}{3}\%$

Sol.186.(d)
Total cost = 27000 × $\frac{115}{100}$ = 31,050
Final cost including GST = 31,050 × $\frac{106}{100}$
= Rs 32,913

Sol.187.(a) Profit = 25% = $\frac{1}{4}$
If CP = 4 then SP = 5
X : y = 5 : 4

Sol.188.(b)
Let the CP of horse = 100 units
Loss = 8%, SP = 92 units
Profit = 14.5%, SP = 114.5 units
Difference of SP = 114.5 - 92 = 22.5units
⇒ 1800
CP = $\frac{1800}{22.5} \times 100$ = Rs 8,000

Sol.189.(c) A shopkeeper purchased an article for Rs.3,000.
So, the percentage of profit (approximately) if he sells that article for Rs.3,600
= $\frac{(3600-3000)}{3000} \times 100 = 20\%$

Sol.190.(d) Ramesh buys an article for 15% less than its original value.

So, if the original value is 100 then cost price = 85 ₹
Again he sells it for 10% more than its original value.
i.e. The selling price = 110 ₹
So the percentage gain = $\frac{110-85}{85} \times 100 = 29.41\%$

Sol.191.(c) Let the CP of car A = 100x
CP of car B = 6,50,000 - 100x
SP of car A = 100x + 20x = 120x
SP of car B = (6,50,000 - 100x)$\times\frac{75}{100}$
= 4,87,500 - 75x
A/Q, 120x = 487500 - 75x
⇒ 195x = 487500 ⇒ x = 2500
CP of car A = 100 × 2500 = Rs 2,50,000
CP of car B = 6,50,000 - 2,50,000
= Rs 4,00,000

Sol.192.(b) He bought 10 toffees in 1 rs.
$\frac{10 \times 100\%}{1} = \frac{x \times (100+25)\%}{1}$ ⇒ x = 8

Sol.193.(a) CP of 120 pen = SP of x pen
Given, they get 25% profit .
$\frac{CP}{SP} = \frac{X}{120} \Rightarrow \frac{4}{5} = \frac{x}{120} \Rightarrow$ x = 96

Sol.194.(b)
Total cost price = 30000 + 5000
= 35000 rs
Selling price = 42000
Profit % = $\frac{7000}{35000} \times 100 = 20\%$

Sol.195.(a)
CP for Y = SP for X = 1,50,000 × $\frac{105}{100}$
$= 1,57,500$
Y sold the car back to X at a loss of 2%
SP = 1,57,500 × $\frac{98}{100} = 1,54,350$
X gains = 1,57,500 - 1,54,350 = Rs 3,150

Sol.196.(c)
Let the CP of samsung mobile = 100x
And the CP of MI mobile = 100y
A/Q, 200x + 300y = 40,200
⇒ 2x + 3y = 402 --------- (1)
Total profit on Samsung phone = 2 × 10x
= 20x
Total profit on MI phone = 3× $20y = 60y$
20x + 60y = 5640
⇒ x + 3y = 282 ---------- (2)
On solving equation (1) and (2) we get,
x = 120 and y = 54
CP of each MI phone = 100 × 54
= Rs 5400

Sol.197.(b)
The CP of Y = 1,50,000 × $\frac{105}{100}$
$= 1,57,500$
SP of Y = 1,57,000 × $\frac{99}{100} = 1,55,925$
Profit of X in entire transaction = 1,57,500 - 1,55,925 = Rs 1,575

Sol.198.(d) A shopkeeper sells a chair for Rs.639 and incurs a loss of 10%.
Then the cost price (in Rs) of the chair = 639 × $\frac{100}{90}$ = Rs.710

Sol.199.(d) Ram bought a cycle for Rs. 1,900 and sold it for Rs.1,862.
So, The percentage loss = $\frac{1900-1862}{1900} \times 100 = 2\%$

Sol.200.(a) CP of 1 banana = 2/3
SP of 1 banana = 3/2
Profit = SP - CP
= 3/2 - 2/3 = 5/6
Profit percent = Profit/CP × 100
= $\frac{\frac{5}{6}}{\frac{2}{3}}$ × 100 = 125%

Sol.201.(b) CP of Banana = $\frac{10}{6}$
SP of Banana = $\frac{6}{4}$
Loss = CP - SP
Loss = $\frac{10}{6} - \frac{6}{4} = \frac{2}{12} = \frac{1}{6}$
Loss Percent = $(\frac{\frac{1}{6}}{\frac{10}{6}})$ × 100 = 10%

Sol.202.(b) According to the question, .
33SP - 33CP = 11SP
22SP = 33CP
→ CP : SP = 22 : 33 = 2 : 3
Profit % = $\frac{1}{2}$× 100 % = 50 %

Sol.203.(a) Let Cost for A = x
According to the question,
$x \times \frac{11}{10} \times \frac{21}{20}$ = 462 ⇒ x = 400

Sol.204.(c) According to the questions,
$\Rightarrow 10 \times cp = 8 \times sp$
$\Rightarrow \frac{sp}{cp} = \frac{10}{8}$
So the percentage gain = $\frac{2}{8}$× 100%
= 25%

Sol.205.(d) Let the CP of article = 100
Loss = 5% = 5, SP = 95
Profit = 5% =5, SP = 105
Difference of SP = 10 which is equal to Rs 5
CP = $\frac{5}{10} \times 100 = Rs\ 50$

Sol.206.(c) Net change in profit =
+25 - 20 - $\frac{25 \times 20}{100}$ = 0%

Sol.207.(d) Let , cost price = 100 unit
Initial profit = 140% of 100 = 140 unit
Selling price = 100 + 140 = 240
Then , new selling price = 50% of 240 = 120 unit
Number of bicycle sold in new SP = 1 + $\frac{700}{100}$ = 8 unit
Now , net selling price = 120 × 8 = 960
Net cost price = 100 × 8 = 800
Net profit = 960 - 800 = 160
Hence , profit % = $\frac{160}{800} \times 100$ = 20%

Sol.208.(d) Price of the 200 quintals wheat = 200 × 1200 = 240000
Then final CP of 200 quintals wheat = 240000 + 10000 = 250000
CP of the 20000 kg = 250000
CP of the 1 kg = $\frac{250000}{20000}$ = 12.5 Rs
SP of the 1 kg = 13 Rs
Then profit % = $\frac{0.5}{12.5} \times 100$ = 4%

Sol.209.(b) 93% of article price = 31
100% of the price = $\frac{31}{93}$ × 100 % = $\frac{100}{3}$
Profit % = $\frac{35 - \frac{100}{3}}{\frac{100}{3}}$ × 100 % = 5%

Sol.210.(b) CP = 100 ,Profit % = 20 % so that SP = 120
According to question,
CP is increase 5% then CP = 105
And SP remains the same.
New profit % = $\frac{15}{105} \times 100$ = 14.28%

Sol.211.(b) CP of 15 toffee = Rs 3
SP of 3 toffee = Rs 2
SP of 15 toffee = Rs 10
Profit = 10 - 3 = 7
Profit% = $\frac{7}{3} \times 100 = 233\frac{1}{3}\%$

Sol.212.(c) Let the CP = 100 units
Loss = 25% = 25 units
SP = 100 - 25 = 75 units which is equal to 52,500
Loss = $\frac{52500}{75} \times 25 = Rs\ 17,500$

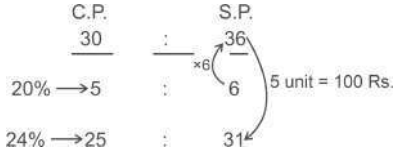
Sol.213.(a) If loss = 10% , SP = 90%
If profit = 20% , SP = 120%

RS	Quantity	SP
30	50	90
28	x	120

$\Rightarrow 30 \times x \times 120 = 28 \times 50 \times 90$
$\Rightarrow x = \frac{28 \times 50 \times 90}{30 \times 120}$ = 35

Sol.214.(c)
Let the cost price of a table = Rs. T and cost price of a chair = Rs. C.
Then $12\frac{1}{2}$% of T + ($-8\frac{1}{3}$%) of C = 25
And ($-8\frac{1}{3}$%) of T + $12\frac{1}{2}$% of C = 0
Or, $\frac{25}{2}$T - $\frac{25}{3}$C = 2500 .....(i)
$-\frac{25}{3}$ T + $\frac{25}{2}$C = 0.....(ii)
(i) ÷ 2 + (ii) ÷ 3
Then, $\frac{25}{4}$T - $\frac{25}{9}$T = 1250
Or, T[$\frac{225-100}{36}$] = 1250
∴ T = 360
Price of table = 360

Sol.215.(d)



5 units = 100 Rs.
So, cost price = 30 units = 30 × 20 Rs.
= 600 Rs.

Sol.216.(d) CP = 850 Rs and SP = 680 , Difference between SP and CP = 170
Loss % = $\frac{170}{850}$ × 100 = 20%

Sol.217.(d) 80% of CP = 1500
120 % of CP = ?
Then ⇒ ? = $\frac{1500\times120}{80}$ = Rs.2250

Sol.218.(b)
$\frac{Items(x)\times profit\ or\ loss\ percentage}{price}$
= $\frac{Items(y)\times profit\ or\ loss\ percentage}{price}$
$\frac{10\times130\%}{1}$ = $\frac{y\times100\%}{1}$ ⇒ y = 13

Sol.219.(a) The mean daily profit by a shopkeeper in a month of 30 days was Rs. 450.
mean profit for the first 20 days was Rs. 300
Let the profit for last 10 days be x
30 × 450 = 20 × 300 + 10 × x
13500 = 6000 + 10x
7500 = 10x ⇒ X = 750

Sol.220.(d) Let the CP of two tables be a and b respectively.
ATQ, $a \times 6\% = b \times 7.5\%$
a : b = 5 : 4
ATQ, (5 + 4) unit = 1350
(5 - 4) = 1 unit = 150 Rs.

Sol.221.(d) Original cost price = $\frac{100}{110}$ × $\frac{100}{115}$ × 5060 = 4000

Sol.222.(b) When he sells at 12% profit
Then price of one cake = $\frac{84}{12}$ = 7
ATQ,
112% = 7
120% = $\frac{7}{112}$× 120 = 7.50

Sol.223.(d) A/Q 85% → 510
115% → ? ⇒ ? = $\frac{510\times115}{85}$ = Rs.690

Sol.224.(d)

CP	SP	MP
100	93	
	90	100

100 × 90 : 93 × 90 : 93 × 100
900 837 930
When article is sold at MP
Profit % = $\frac{30}{900}\times100 = 3.33\%$

Sol.225.(b)
The bill amount = 450 × $\frac{105}{100}$
$= Rs\ 472.50$

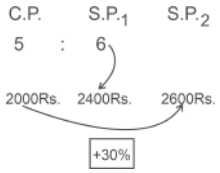
Sol.226.(c) Gain = 1140 - 950 = 190
Gain % = $\frac{190}{950}\times100 = 20\%$

Sol.227.(c) Let the CP of book = 100
If P = 14% = 14, SP = 114
If P = 20% = 20, SP = 120
DIfference of SP = 120 - 114 = 6 ⇒ $Rs\ 5.40$
∴ CP of book = $\frac{5.40}{6}\times100 = Rs\ 90$

Short Tricks:-
Difference in % = 6% = 5.40 Rs.
C.P. = 100% = $\frac{5.40}{6}\times100 = Rs\ 90$

Sol.228.(a) Let the CP = 100
Profit = 20% = 20, SP = 100 + 20 = 120 ⇒ $Rs\ 2400$
CP = $\frac{2400}{120}\times100 = Rs\ 2000$
New SP = 2600
P = 2600 - 2000 = 600
Profit % = $\frac{600}{2000}\times100 = 30\%$

Short Tricks:-
Fractional value of 20% = $\frac{1}{5}$



Sol.229.(b) Let the CP of cow = 100
5% = 1010 -1000 = 10
CP = $\frac{10}{5}\times100 = 200$

Sol.230.(c) Let the CP of 1st table = 100
Profit = 25% = 25
SP = 125 ⇒ $Rs\ 400$
CP = $\frac{400}{125}\times100 = Rs.320$
Profit on 1st table = 400 - 320 = Rs 80
On selling 2nd table loss = 10% and overall no gain and loss.
So the profit of 1st table = loss of 2nd table
10% = 80
CP of 2nd table = $\frac{80}{10}\times100 = Rs\ 800$

Sol.231.(c) SP = 540
Profit = 20%
∴ CP : SP → 5 : 6
6 unit = 540 ⇒ 5 unit = 450

Sol.232.(b)
Let the CP of article = 100 units
P = 14%, SP = 114 units
L = 10% = 10, SP = 100 - 10 = 90 units
Difference in SP = 114 - 90
= 24 $units \Rightarrow Rs\ 60$
CP = $\frac{60}{24}\times100 = Rs.\ 250$

Sol.233.(c) Let SP = 100
P = 20% = 20 , CP = 100 - 20 = 80
If profit is calculated on CP
Profit % = $\frac{20}{80}\times100 = 25\%$

Sol.234.(c)CP = 120 Rs , Loss % = 5%
Loss = 120× $\frac{5}{100}$ = 6
SP = CP-Loss = 120 - 6 = 114 Rs

Sol.235.(d) Let the CP = 100
A/Q,
MP = 100 + 20 = 120
D = 20% = $\frac{20}{100}\times120 = 24$
SP = 120 - 24 = 96
Loss = CP - SP = 100 - 96 = 4%

Short Trick:
⇒ +20 + (-20) - $\frac{20\times20}{100}$ = - 4%

Sol.236.(a) Let repair cost = x
ATQ,
$(4600 + x)\times\frac{106}{100} = 5406$ x=500

Sol.237.(c)
SP of each article = 4000 rupees
For 1st article Profit % = 15 and For 2nd article Loss % =15

CP of 1st article = $\frac{100}{115} \times 4000$

= 3478.26 Rs.

CP of 2nd article = $\frac{100}{85} \times 4000$

= 4705.88 Rs.

Total CP = 3478.26 + 4705.88

= 8184.14 Rs.

Total SP = 4000+4000 = 8000 Rs.

Loss = 8184.14 - 8000 =184.14 Rs.

or 184 rs.(approx)

Shortcut: If profit and loss is equal then apply direct formula = $\frac{-x^2}{100}$

Sol.238.(d) The sum of cost prices of two bikes = 100000 Rs

Let CP of 1st bike = a ,

CP of 2nd bike = b

120% of a = 80% of b

a : b = 2 : 3

CP of 1st bike = $\frac{2}{5} \times 100000$ = 40000 Rs.

Sol.239.(b) A/Q ,

110% = 24750 Rs

100% = $\frac{24750 \times 100}{110}$ = 22500 Rs

When production cost 15% increase,

= $\frac{22500 \times 115}{100}$ = 25875 Rs

New CP =100% = 25875

Hence final SP = 115% = $\frac{25875 \times 115}{100}$

= 29756.25 Rs.

Sol.240.(d) Let the CP = 100 units

MP = 125 units

D = 12% = $\frac{12}{100} \times 125 = 15$ units

SP = 125 - 15 = 110 units

P = 110 - 100 = 10%

Sol.241.(c) Let , CP = 100 and MP = 150

A/Q , discount % = 25%

SP = 150 × $\frac{75}{100}$ ⇒ SP = 112.5

When 25% profit on CP

SP = 100 × $\frac{125}{100}$ = 125 Now ,

actual profit % = $\frac{125 - 112.5}{100}$ × 100

= 12.50%

Sol.242.(a) Total CP = 1200+300 = 1500

SP = 2000

Profit = 2000 - 1500 = 500

Profit % = $\frac{500}{1500} \times 100 = 33\frac{1}{3}\%$

Sol.243.(d)

SP = 750 Rs , Profit = $\frac{1}{9}$ × CP

CP : Profit : SP = 9 : 1 : 10

CP = 750 × $\frac{9}{10}$ = 675 Rs.

9 unit = 675 ⇒ 1 unit = profit = 75

Percentage gain = $(\frac{75}{675}) \times 100 = \frac{100}{9}\%$

Sol.244.(b) Rotten = 40 mangoes

Good mangoes = 20 × 12 - 40

= 200 mangoes

Total SP = 1000 + 30% of 1000

= 1300 Rs.

SP of 1 dozen mango = $\frac{1300}{200} \times 12 = 78$

Sol.245.(b)

Let the CP of item = 100 unit

P = 11 % = 11, SP = 111 unit

L = 13% = 13, SP = 87 unit

Difference in SP = 111 - 87 = 24 unit

24 unit = Rs 204

CP = 100 unit = $\frac{204}{24} \times 100 = Rs\ 850$

Sol.246.(d) Let marked price = 100

CP for mahesh = 100 × $\frac{9}{10}$ = 90

SP for mahesh = 100 + 8 = 108

P = 108 - 90 = 18

Profit % = $\frac{18}{90} \times 100 = 20\%$

Sol.247.(b)

CP of 1 item = $\frac{100}{12}$ paise

SP of 1 item = $\frac{100}{12} \times \frac{120}{100}$ = 10 paise

No. of items bought in 1 rupee

= $\frac{100\ paise}{10\ paise/item}$ = 10

Sol.248.(d) Ratio between CP and SP of the given article = 4 : 7

Profit = SP - CP = 3 unit

Ratio between the profit and the cost price of the given article = 3 : 4

Sol.249.(a) Overall profit = 38%

Let the CP = 100

SP = 100 × $\frac{115}{100} \times \frac{100 + x}{100} = 138$

⇒ $23(100 + x) = 138 \times 20$

⇒ $2300 + 23x = 2760$

⇒ $23x = 2760 - 2300 = 460$

⇒ $x = 20$

Second person get profit = 20%

Sol.250.(a)

Car Sold by Ramu to Rahul at 5% profit

For ramu ,

100% = 200000 Rs.

105 % = $\frac{200000 \times 105}{100}$ = 210000 Rs

Then rahul sold to ramu at 2% loss

CP for rahul = 100% = 210000

SP for Rahul = (98%) = $\frac{210000 \times 98}{100}$

= 205800 Rs.

Now , Ramu's net profit (in Rs.) in complete transaction = 210000 - 205800

= 4200 Rs

Sol.251.(b) Let the printed price = 100

D= 24% = 24

CP for woman = 100 - 24 = 76

SP for woman = 100 + 20 = 120

Profit = 120 - 76 = 44

Profit % = $\frac{44}{76} \times 100 = 57\frac{17}{19}\%$

Sol.252.(d)

CP of the article = $\frac{1875 + 1385}{2}$ = 1630

Sol.253.(c) Let the CP = 1000 Rs.

L = 40 Rs., SP = 960 Rs.

Shopkeeper uses 20g instead of 25g

And uses 800g instead of 1000g then

Profit = 960 - 800 = 160g

P % = $\frac{160}{800} \times 100 = 20\%$

Sol.254.(d) Let SP of 1 chair = x rupees.

SP of 25 chairs = 25x rupees

Profit = 5x rupees

CP of 25 chairs = 25x - 5x = 20x rupees

Now, 20x = 37500

X = $\frac{37500}{20} = Rs.1875$

Sol.255.(a)

Let the total number of apples = x unit

So,

Total CP = $\frac{50}{5}x + \frac{50}{6}x = \frac{55}{3}x$

Total SP = $\frac{100}{11}$ × 2x = $\frac{200}{11}x$

So, total loss % = $\frac{\frac{55}{3}x - \frac{200}{11}x}{\frac{55}{3}x} = \frac{100}{121}\%$

Sol.256.(c) Let the MP of each pen = 1

CP of 20 pens = MP of 15 pens = 15

MP of 20 pens = 20

D = 1% = 0.2

SP = 19.8

P = 19.8 - 15 = 4.8

Profit % = $\frac{4.8}{15} \times 100 = 32\%$

Sol.257.(c)

One - third of 42000 = 42000×$\frac{1}{3}$= 14000

10% profit in 14000 = 14000 × $\frac{110}{100}$

= 15400 Rs

two - third of 42000 = 42000×$\frac{2}{3}$ = 28000

Loss of 10% in 28000 Rs = 28000 × $\frac{90}{100}$

= 25200 Rs

Now ,

final loss = 42000 - (15400 + 25200)

= 1400 Rs

Sol.258.(a) Let , total goods = 100 unit
40% of goods = 40 unit
60% of goods = 60 unit
Total profit = 250
Total Selling Price of goods = 40*0.98 + 60*1.04 =101.6 unit
Profit = 101.6-100 = 1.6 unit
1.6 unit = 250
So 100 unit = (250 *100)/1.6 = Rs 15625

Sol.259.(a)
10 % profit on car (selling price) =
$300000 \times \frac{110}{100}$ = 330000 Rs
20% loss on bike (selling price) = 100000 $\times \frac{80}{100}$ = 80000 Rs
Total cost price = 300000 + 100000 = 400000 Rs
Total selling price = 330000 + 80000 = 410000 Rs
Final profit = $\frac{10000}{400000} \times 100$ = 2.5 %

Sol.260.(c) Let the CP = 100
P = 16%, SP =116
L = 12%, SP = 88
Difference between SP = 116 - 88 = 28
28 unit = Rs 70
CP = 100 unit = $\frac{70}{28} \times 100 = Rs\ 250$

Sol.261.(d) Let CP of each toy = 1
CP of 18 toys = 18
SP of 18 toys = 18 - 4 = 14
14 unit = Rs 980
1 unit = $\frac{980}{14} = Rs\ 70$

Sol.262.(d) Let the MP of TV set = 100
D = 10% = 10
SP = 100 - 10 = 90
A/Q,
90 unit = 9090
MP = 100 unit
= $\frac{9090}{90} \times 100 = Rs\ 10100$

Sol.263.(c) By selling an article for Rs. 1600, a person lost 20%.
So, the cost price = $\frac{100}{80} \times 1600$ = 2000
Then to make a profit of 20% it should be sold at = $2000 \times \frac{120}{100} = 2400$

Sol.264.(c) Given, A man sell a car to his friend at a loss of 20%
A/Q, let be assume the initial value of the car is P
$\Rightarrow P \times (\frac{80}{100}) \times (\frac{130}{100}) = 58{,}000$
$\Rightarrow P = 58{,}000 \times \frac{10000}{10400}$ = 55,769 Rs

Sol.265.(a) CP for 80 kg = Rs 320
CP for 1 kg = 4Rs
SP for 1 kg = 4.5 Rs
P = 4.5 - 4 = 0.5
Profit % = $\frac{0.5}{4} \times 100 = \frac{100}{8} = 12\frac{1}{2}\%$

Sol.266.(b) Original price = 100 unit
Somanth buy on 85 unit and Somanth sold on $85 \times \frac{135}{100}$ = 114.75
Hence , percentage sales price set by Somanth is more
than the original price = 114.75 - 100
= 14.75%

Sol.267.(c) If MP = 400 , CP = 300
15% of 400 = 60
SP = 400 + 60 = 460
P = 460 - 300 = 160
Profit percentage = $\frac{160}{300} \times 100 = 53\frac{1}{3}\%$

Sol.268.(b) Let , MP = 100 unit
CP = 64 unit , discount % = 12 %
Then , SP = 88
Hence , P % = $\frac{88-64}{64} \times 100$ = 37.5 %

Sol.269.(c)
SP = 375000 $\times \frac{85}{100} = Rs.\ 3,18,750$

Sol.270.(a) 25 % = $\frac{1}{4}$
CP = 4 unit and SP = 5 unit
5 unit = 750 Rs
4 unit = $\frac{750 \times 4}{5}$ = 600 Rs
SP = 660 Rs
Profit % = $\frac{60}{600} \times 100$ = 10%

Sol.271.(c) CP = $54 \times 25 = Rs\ 1350$
4 kg oranges are rotten
Remaining = 54 - 4 = 50 kg
SP = $50 \times 36 = Rs\ 1800$
P = 1800 - 1350 = Rs450
Profit % = $\frac{450}{1350} \times 100 = 33\frac{1}{3}\%$

Sol.272.(a) Profit % = 10% = $\frac{1}{10}$, means base of the fraction will be the cost price = 10
And SP = (10 + 1) = 11
When loss of 10% means CP = 10 unit , SP = 9 unit
A/Q, (11 - 9) unit = 2 unit = 150 Rs
10 unit = $\frac{150 \times 10}{2}$ = 750 Rs.

Sol.273.(c) Let the SP of each pencil = 1
SP of 78 pencils = 78
P = 13
CP = 78 - 13 = 65
Profit % = $\frac{13}{65} \times 100 = 20\%$

Sol.274.(d) 12.5% = $\frac{1}{8}$
So ratio of CP : SP = 8 : 7
SP was half so, double it now ratio becomes = 8 : 14
Required percentage = $\frac{6}{8}$ × 100 = 75%

Sol.275.(d) Reduced price of 1 mango
= $\frac{2250 \times 10}{100 \times 10}$ = 22.5 rupees
Reduced price of 1 dozen mangoes
= 22.5×12 = 270 rs.

Sol.276.(d) According to the question
(3.5 + 8)% of CP = 172.5
CP = 1500
113% of CP = 1,695

Sol.277.(c) Ratio of CP
A : B : C = 100 : 120 : 144 = 25 : 30 : 36
A/Q,
36 unit = Rs 360
25 unit = Rs 250

Sol.278.(a) Let CP of one article = 100
SP = 100 + 20 = 120
CP of other article = 120
Loss = 20% = 24
SP of other article = 120 - 24 = 96
Total CP = 100 + 120 = 220
Total SP = 120 + 96 = 216
Loss = 4
Loss% = $\frac{4}{220} \times 100 = 1.8\%$

Sol.279.(d)
Given , SP = 144 and profit % = cost price
We know that profit = SP - CP,
Now ,
Profit % = cost price
$\frac{profit}{CP} \times 100 = CP$
100 × (SP - CP) = CP × CP
100 × (144 - CP) = CP × CP
CP = 80

Sol.280.(a) Let , cost price = 100% ,
A/Q , $\frac{1}{32}$ = 60%
Now , $\frac{1}{x}$ = 120%
x = 16 orange

Sol.281.(c)
Let CP of the washing machine = 100
P = 8%, SP = 108
A/Q, 108 unit = Rs 21,600
If profit = 20%
New SP = 120 unit = $\frac{21600}{108} \times 120$

= Rs 24,000

Sol.282.(d) SP of 16 oranges = Rs 42

SP of 1 orange = $\frac{42}{16} = Rs 2.625$

Let CP of each orange = 100

P= 25% , SP = 125

A/Q,

125 unit = 2.625

CP = 100 unit = $\frac{2.625}{125} \times 100 = Rs\ 2.1$

Number of oranges bought for Rs 42

= $\frac{42}{2.1} = 20$

Sol.283.(b) Total CP = $240 \times 8 = 1920$

Broken cups = 24

Remaining cups = 240 - 24 = 216

SP = $216 \times 12 = 2592$

P = 2592 - 1920 = 672

P % = $\frac{672}{1920} \times 100 = 35\%$

Sol.284.(d) selling price of an articles is $\frac{5}{4}$ of its cost price

If CP = 4 , SP = 5

P = 5 - 4 = 1

P% = $\frac{1}{4} \times 100 = 25\%$

Sol.285.(a) CP of 5 banana = Rs 20

CP of 3 banana = $\frac{20}{5} \times 3 = Rs\ 12$

SP of 3 banana = Rs 15

Profit = 15 - 12 = 3

Profit % = $\frac{3}{12} \times 100 = 25\%$

Sol.286.(d)

We know , 20 % = $\frac{1}{5}$ and 25% = $\frac{1}{4}$

Ratio of the cost price of X and Y

X	:	Y
5	:	6
4	:	5

20 : 24 : 30

30 unit = 225 Rs

20 unit = $\frac{225 \times 20}{30}$ = 150 Rs

Sol.287.(c) Let the CP of article = 100

L = 15 , SP = 100 - 15 = 85

If P = 10% = 10

New SP = 100 +10= 110

A/Q,

85 unit = Rs 170

110 unit = $\frac{170}{85} \times 110 = Rs\ 220$

Sol.288.(b)

Ratio of CP : SP = 9 : 12 = 3 : 4

P = 3 - 4 = 1.....(a)

Given Ratio of Discount and Profit = 5 : 10 = 1 : 2.....(b)

From (a) and (b) on equating, We get

$\frac{D}{P} = \frac{1}{2}$ i.e. $\frac{CP}{SP} = \frac{6}{8}$

Then, CP : SP : MP = 6 : 8 : 9

Discount = 9 - 8 = 1

Discount % = $\frac{1}{9} \times 100 = 11.11\%$

Sol.289.(a) As we know :

$\frac{mp}{cp} = \frac{100+P}{100-D} \Rightarrow \frac{mp}{cp} = \frac{120}{80} = \frac{3}{2}$

Then the marked price is above the cost price by = $\frac{(3-2)}{2} \times 100 = 50\%$;

Sol.290.(d) Let the Cost Price = CP ;

The difference between a 12.5% profit and a 10.5% loss, while selling an item, is Rs. 161.

A/Q

$\Rightarrow \{12.5 - (-10.5)\}\%\ of\ CP = 161$

$\Rightarrow 23\%\ of\ CP = 161 \Rightarrow CP = 700$

The selling price of the item if the intended profit is 19% is = $700 \times \frac{119}{100}$ = 833 Rs.

Sol.291.(d) Let the CP of the book = 100

P = 10% = 10 , SP = 110

P = 15% = 15, SP = 115

Difference of SP = 5

A/Q, 5 unit = Rs 20

CP = 100 unit = $\frac{20}{5} \times 100 = Rs.400$

Sol.292.(a) Let the cost price of the watch = 100 units

Then , S.P of the watch after selling at 5% loss = 95 units

Now, C.P is increased by 20%, new C.P = 120 units

Now, new S.P = 120 × $\frac{60}{100}$ = 72 units

Difference in S.P. (95 – 72) units = 115 Rs.

Then , C.P. (100 units) → $\frac{115}{23}$ × 100 = 500 Rs.

Sol.293.(b) C.P. of 6 articles = 5Rs.

C.P. of 1 article = $\frac{5}{6}$ Rs.

C.P. of 5 article = $\frac{25}{6}$ Rs.

S.P. of 5 articles = 6 Rs.

Profit % = $\frac{6 - \frac{25}{6}}{\frac{25}{6}} \times 100$

Profit % = $\frac{11}{25}$ × 100 = 44%

Short Tricks:-

L.C.M. of 6 and 5 = 30

C.P. of 30 articles = 25 Rs.

S.P. of 30 articles = 36 Rs.

Profit % = $\frac{36-25}{25}$ × 100 = 44%

Sol.294.(c)

C.P. for A = $300 \times \frac{100}{125}$ = 240 Rs.

C.P. for C = $300 \times \frac{90}{100}$ = 270 Rs.

Required % = $\frac{270}{240} \times 100$ = 112.5%

Sol.295.(d) $\frac{C.P}{M.P} = \frac{(100 - D\%)}{(100 + G\%)}$

$\Rightarrow \frac{C.P}{M.P} = \frac{78}{117}$ or $\frac{6}{9}$

Required markup%

= $\frac{9-6}{6} \times 100 = 50\%$

Sol.296.(a) Let cp = 100 unit

Then sp_1 = 104 unit and sp_2 = 106 unit Given, sp_2 - sp_1 = 3

⇒ 106 unit - 104 unit = 3

1 unit = $\frac{3}{2}$

So $\frac{sp_1}{sp_2} = \frac{104 \times \frac{3}{2}}{106 \times \frac{3}{2}}$ = 52 : 53

Sol.297.(d) Let , Initial S.P. be 100

Then , New S.P. = 100 × $\frac{60}{100}$ → 60

CP of the article → 60 × $\frac{100}{65} = \frac{1200}{13}$

Profit % = $\frac{100 - \frac{1200}{13}}{\frac{1200}{13}} \times 100$

= $\frac{100}{1200} \times 100 \rightarrow \frac{100}{12} = 8\frac{1}{3}\%$

Sol.298.(c) Cost price for C = 2860 Rs.

Cost price for B = 2860 × $\frac{10}{13}$ = 2200 Rs.

Then, Cost price for C = 2200 × $\frac{10}{11}$ = 2000 Rs.

Sol.299.(d) A.T.Q . ,

n × SP = 10 × CP → $\frac{CP}{SP} = \frac{n}{10}$

Profit on the pens be→ 100%

$\therefore \frac{10-n}{n} \times 100 = 100 \rightarrow n = 5$

Sol.300.(d) A.T.Q . ,

CP of the each article be → 400

SP of the first article be → 400 × $\frac{9}{8}$ = 450

SP of the second article be→ 400 × $\frac{7}{8}$ = 350

Therefore, difference between the SP of both articles be → (450 – 350) = 100 Rs

Sol.301.(b)
Cost price of 100 oranges = 80Rs.
Fresh orange = $(100 - 20) = 80$
S.P. to get 25 %Profit = $\frac{80 \times 125}{100}$
= 100Rs.
Rate at which selles the fresh oranges
= $\frac{100}{80}$ = 1.25 Rs.

Sol.302.(d) $x \times \frac{110}{100} \times \frac{115}{100} \times \frac{125}{100}$
= 1265 $\Rightarrow x = 800$

Sol.303.(c) Let the cost price is = x Rs.
and profit = $\frac{x}{4}$ Rs.
According to question,
Profit = S.P. - C.P.
$\frac{x}{4}$ = 375 − x → x = 1500 - 4x
5x = 1500 Rs. ⇒ x = 300 Rs.

Sol.304.(c)
Let the cost price of an article = 100 unit
S.P. at 5 % of profit = 105 unit
S.P. at 5 % of loss = 95 unit
A.T.Q . ,
Difference of selling price = $(105 - 95)$ unit = 15 Rs.
10 units = 15 Rs.
Total C.P. (100 units) = $\frac{15}{10} \times 100$ = 150 RS.

Sol.305.(a)
SP of X = 150000 × $\frac{105}{100}$ = 157500
SP of Y = 157500 × $\frac{98}{100}$ = 154350
Total profit of X = 157500 - 154350
⇒ Rs.3150

Sol.306.(b) According to the question,
Combined SP of the both article
= 840 + 960 ⇒ 1800
for 1^{st} article CP = 840 × $\frac{5}{6}$ ⇒ 700
for 2^{nd} article CP = 960 × $\frac{25}{24}$ ⇒ 1000
Combined CP = 1700
Here (gain or loss) % = $\frac{Total\ gain\ or\ loss}{CP}$
× 100 = $\frac{1800 - 1700}{1700} \times 100$
⇒ $\frac{+100}{1700} \times 100 \Rightarrow 5\frac{15}{17}$% gain

Sol.307.(d) Cost price both article
= 5000
Profit on both article = $\frac{5000 \times 20}{100}$ = 1000
Profit on first article = $\frac{2500 \times 5}{100}$ = 125
Profit on second article
= $\frac{1000 - 125}{2500} \times 100$ = 35%

Sol.308.(b) If the S.P. is same for both article then always loss
= $\frac{-x^2}{100}$ = $\frac{-20 \times 20}{100}$ = loss of 4%

Sol.309.(d) Let the cost price of the two articles be x and y.
According to the question ,
x × 15% = y × 20%
$\frac{x}{y} = \frac{20}{15} = \frac{4}{3}$
Ratio of C.P. of the articles = 4 : 3
Only option (d) satisfies the given condition .

Sol.310.(b) According to the question,
20CP = xSP ⇒ $\frac{CP}{SP} = \frac{x}{20}$
$\frac{20 - x}{x} = \frac{1}{4} \Rightarrow x = 16$

Sol.311.(d) Two successive discounts are 10% and 20% .
S.P. after these discounts →
6000 × $\frac{9}{10} \times \frac{4}{5}$ = 4320Rs.

Sol.312.(c) According to the question,
(CP of 17 balls)−(SP of 17 balls) = (CP of 5 balls)
→ CP of 12 balls = 720
∴CP of 1 ball = $\frac{720}{12}$ = 60 Rs.

Sol.313.(b) Cost Price → 8 apples = 34 Rs.
Then, C.P.(12 apples) = $\frac{34}{8}$ × 12 = 51 Rs.
Selling Price → 12 apples = 57 Rs.
Profit in selling 12 apples = 57 − 51 = 6 Rs.
To earn a profit of 45 Rs. → $\frac{12}{6}$ × 45
= 90 apples.

Sol.314.(a) Let , C.P an article = 100
Then , S.P of an article = 112
Ratio → S.P : C.P = 112 : 100 = 28 : 25

Sol.315.(a) CP of ten dozen chocolates are = 10 × 10 ⇒ 100
Total CP = 100 + 50 ⇒ 150
SP = 120 × 2 ⇒ 240
Profit percent = $\frac{240 - 150}{150}$ × 100 ⇒ 60%

Sol.316.(d)
Let the marked price of an oven = 100
Cost price of an oven ⇒ 100 − 10 = 90
According to question ,
Selling price of an oven ⇒ $\frac{90 \times 13}{10}$ = 117
Required profit % ⇒ $\frac{117 - 100}{100} \times 100$
= 17%

Sol.317.(d) According to the question ,
24 × CP = 18 × SP
$\frac{CP}{SP} = \frac{3}{4}$
Required profit % = $\frac{4 - 3}{3} \times 100$
= 33.33%.

Sol.318.(b) Given, S.P of the item = Rs.486 and profit % = 8%
C.P of the item = $\frac{100}{108} \times 486 = Rs.450$
New S.P of the item = Rs. 414
Then, loss % = $\frac{450 - 414}{450} \times 100 = 8\%$

Sol.319(a) Cost price × $\frac{108}{100}$ = 2700 Rs.
Cost Price = 2500 Rs.
New selling price = 3000 Rs.
Required profit % = $\frac{3000 - 2500}{2500} \times 100$
= 20%

Sol.320.(a)
Cost price for 40 pieces of banana →
5 × 5 = 25 Rs.
Selling price for 40 pieces of banana →
8 × 8 = 64 Rs.
Required Profit % = $\frac{64 - 25}{25} \times 100$ = 156

Sol.321.(d) A.T.Q .,
Loss% = $\frac{Loss \times 100}{CP} \Rightarrow 20\% = \frac{1}{5}$
S.P. (4 units) = 32 Rs. → 1 unit = 8 Rs.
So, C.P. (5 units) = 40 Rs.

Sol.322.(b) Shopkeeper hopes that his profit will be 50% on the cost price
Therefore, $\frac{SP}{CP} = \frac{3}{2}$
Selling price (3 units) = 450 Rs.
Profit (1 unit) = $\frac{450}{3} \Rightarrow$ 150 Rs.

Sol.323.(b)
Marked price of book = 700 Rs.
Book seller has given 10% discount ,
Then selling price = 700 × $\frac{90}{100}$ = 630 Rs.
Book seller still earns 20% profit , Then
C.P. = $630 \times \frac{100}{120}$ = 525 Rs.

Short Tricks :- Using formula
∴ $\frac{C.P.}{M.P.} = \frac{100 - D\%}{100 + P\%} \Rightarrow \frac{C.P.}{700} = \frac{90}{120}$
⇒ C.P. = 525 Rs.

Sol.324.(b) C.P. : S.P.
1st Article ⇒10 : 11) × 9 .....(1)
2nd Article ⇒10 : 9) × 11 .....(2)
Equating the value of S.P.

	C.P.	:	S.P.
1st Article →	90	:	99
2nd Article →	110	:	99
	200	:	198

Overall profit or loss %

$= \frac{total\ selling\ price - total\ cost\ price}{total\ cost\ price} \times 100 \rightarrow \frac{-2}{200} \times 100 = -1\%$

- ve Sign indicates loss%

Short Tricks :-

If Selling price is same for two different article , and profit % , Loss % are same Then , there will always be loss occurred.

overall loss % = $\frac{P\% \times L\%}{100}$

Here, overall loss % = $\frac{10 \times 10}{100}$ = 1% loss

Sol.325.(b) Profit %

$= \frac{selling\ price - cost\ price}{cost\ price} \times 100$

$= \frac{135 - 108}{108} \times 100 = \frac{27}{108} \times 100 = 25\%$

Sol.326.(d) Loss % = $\frac{C.P. - S.P.}{C.P.} \times 100$

$= \frac{76 - 57}{76} \times 100 = \frac{19}{76} \times 100 = 25\%$

Sol.327.(b)

Marked price of book = 1000 Rs.

Book seller has given 10% discount , Then selling price = $1000 \times \frac{90}{100}$

= 900 Rs.

Book seller still earns 20% profit , Then C.P. = $900 \times \frac{100}{120}$ = 750 Rs.

Short Tricks :-

Using formula :- $\frac{C.P.}{M.P.} = \frac{100 - D\%}{100 + P\%}$

$\frac{C.P.}{1000} = \frac{90}{120} \Rightarrow$ C.P. = 750 Rs.

sol.328.(a) According to question,

112 % Of C.P. ⇒ 336 Rs.

C.P. ⇒ $\frac{336}{112} \times 100$ = 300 Rs

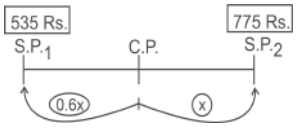
Short Tricks :- Profit% = 12% = $\frac{+3}{25}$

Ratio of	C.P.	:	S.P.
	25	:	28

Here , 28 units = 336 Rs.

Then , 25 units = 300 Rs.

Sol.329.(a)



Total difference = 0.6x + x = 1.6x

⇒ 1.6x = 775 - 535 = 240 Rs.

⇒ x = 150 Rs.

C.P. = 775 - 150 = 625 Rs.

Sol.330.(b)

Shopkeeper earns 12.5% by selling article at 2763 Rs.

Then C.P. for shopkeeper = $\frac{2763}{112.5} \times 100$

= 2456 Rs

50% of C.P. = 1228 Rs

Short Trick :-

C.P. : S.P.

8 : 9

⇒ 9 units = 2763 ,

then 4 units = 1228 Rs.

Sol.331.(c)

Let the C.P. of article be 100 , then M.P. of the article be 142

Now, S.P. = $\frac{142 \times 58}{100}$ = 82.36%

Loss = 100 - 82.36 = 17.64%

Short Tricks :-

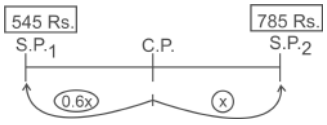
If markup (m%) and discount (d%) is same ,

Then Profit / Loss % = $\frac{m \times d}{100}$

⇒ $\frac{(+42\%)(-42\%)}{100}$ = -17.64%

Here (-) indicate Loss

Sol.332.(b)



Total difference = 0.6x + x = 1.6x

⇒ 1.6x = 785 - 545 = 240 Rs.

⇒ x = 150 Rs.

C.P. = 785 - 150 = 635 Rs.

Sol.333.(a)

Shopkeeper earn 12.5% by selling articles at 2736 Rs.

Then,

C.P. for Rs. shopkeeper = $\frac{2736}{112.5} \times 100$

= 2432 Rs

50% of C.P. = 1216

Short Tricks :-

C.P. : S.P.

8 : 9

⇒ 9 units = 2736, then half of C.P.(4 units) = 1216 Rs.

Sol.334.(b) Let the CP of tea set be x

According to question,

x × 57% = ₹3420

Then, x × 110% = $\frac{3420}{57} \times 110$ = ₹6600

So, the seller should have sold the set for 6600-3420 = 3180 more

Sol.335.(b) Let the CP be x

ATQ, $x \times \frac{110}{100}$ = 440

So , X = 400

Required loss% = $\frac{400-370}{400} \times 100$ = 7.5%

Sol.336.(b) Required no of pens which can be bought for ₹52 = $\frac{192}{10} \times 5$ = 96

Sol.337.(b)

Let the price of chairs and Tables be 9x and 5x respectively

ATQ,

9x - 5x = 4200 ⇒ 4x = 4200 ⇒ x = 1050

The price of the tables

= 5x = 5×1050 = ₹5250

Sol.338.(b) Cost of 1 meter cloth

$= \frac{544}{7 \times 17} = \frac{32}{7} = 4\frac{4}{7}$

Sol.339.(a)

CP of an item = $220 \times \frac{100}{88}$ = ₹250

SP of an item to make a profit of 10%

= $250 \times \frac{11}{10}$ = ₹275

So, required price which should be raised = 275 - 220 = ₹55

Sol.340.(b) According to question,

$\frac{SP}{CP} = \frac{4}{3}$

Required gain%

$= \frac{4-3}{3} \times 100 = \frac{1}{3} \times 100 = 33\frac{1}{3}\%$

Sol.341.(d) SP of defective piece of article

= $1200 \times \frac{17}{20} \times \frac{19}{20}$ = ₹969

Sol.342.(c) Basic price of the television

= $14{,}000 \times \frac{100}{112}$ = ₹12,500

Sol.343.(b)

Let the CP of a used phone be 100%

ATQ, (100-44) = 56%

56% → 6160

Therefore, SP of phone

= $\frac{6160}{56} \times 105$ = ₹11,550

Sol.344.(d)

CP of an article = $2592 \times \frac{100}{108}$ = ₹2400

Sol.345.(c) Given,

selling price of the item = Rs. 696

and loss% = 13%

Cost price of the item

$= \frac{100}{87} \times 696 = Rs.800$

Now, new S.P of the item

$= \frac{110}{100} \times 800 = Rs.880$

To gain a profit of 10 %,
S.P should be increased
= 880 - 696 = Rs. 184

Sol.346.(d) Given,
cost price of the item = Rs.96
and profit % = 12.5%
Then, selling price of the item

$= \frac{112.5}{100} \times 96 = Rs.108$

Sol.347.(c) Given, S.P = Rs.16,870
and loss = Rs.1080
Then, C.P = S.P + Loss
= 16870 + 1080 = Rs.17,950
Now, loss%

$= \frac{loss}{C.P} \times 100 = \frac{1080}{17950} \times 100 = 6.0\%$

Sol.348.(d) Given,
S.P = Rs.435 and profit% = 16%

C.P = $\frac{100}{116} \times 435 = Rs.375$

New S.P = Rs.330
Then, loss%

$= \frac{375-330}{375} \times 100 = \frac{45}{375} \times 100 = 12\%$

Sol.349.(a) Given,
C.P of one dozen eggs = Rs.19.20,
gain % = 25%

S.P. of one dozen eggs = $\frac{125}{100} \times 19.20$

Then, S.P of one egg

$= \frac{1}{12} \times \frac{125}{100} \times 19.20 = Rs.2$

Hence, the selling price of one egg = ₹ 2

Discount

Key Points:

1. Marked Price: The price on the label of a product, also called printed price or advertising price.

2. Discount: Amount of rebate on a fixed price is called discount.

3.Selling Price = Marked Price – Discount

Let us say Rs. 100 is the marked price (MRP). and Discount is 10% i.e. 10 Rs

Therefore, selling price = 100 – 10 = Rs. 90

4. Discount is given / calculated on marked price.

$$Discount\ \% = \frac{M.P. - S.P.}{M.P} \times 100$$

Or, $\frac{Discount}{Marked\ Price} \times 100$

5. Selling Price = $\frac{Marked\ Price \times (100 - Discount\%)}{Marked\ Price}$

6. Successive Discount :- When two or more than two discounts are given.

Ex:- 20% and 10% discount given successively. What does it mean?

Let MRP or marked price be Rs. 100

$100 - 20\% \rightarrow 80 - 10\% \rightarrow 72$

∴ The total discount is Rs.28 i.e. 28% of 100.

∴ Successive discount of 20% and 10% is equivalent to 28% .

The above concept can be interpreted as a successive % concept.

Single equivalent discount

$= (x + y - \frac{xy}{100})\%$

where x, y are discount rates.

Here, $(20 + 10 - \frac{200}{100})\%$

$= 30 - 2 = 28\%$

Example: What will be an equivalent discount for three successive discounts of 20%, 20%, and 10%?

Solution: First calculate an equivalent discount for any two of the three, let's take 20% and 20%.

$(20 + 20 - \frac{400}{100})\% = 40 - 4 = 36\%$

Now calculate equivalent discounts of 36% and 10%.

$(36 + 10 - \frac{360}{100})\% = 46 - 3.6 = 42.4\%$

⇒ 42.4% is the equivalent discount.

Single equivalent discount

$= (x + y + z - \frac{xy + yz + zx}{100} + \frac{xyz}{10000})\%$

where x, y and z are discount rates.

7. Present worth =

Amount – True discount

True discount = $\frac{Amount \times Rate \times Time}{100 + (Rate \times Time)}$

Variety Questions

Q.1. Which of the following is the most beneficial for a customer ?

Scheme 1.) Buy 5 get 3 free

Scheme 2.) Buy 5 get 6

Scheme 3.) Two successive discounts of 10% and 5%

Group D 17/08/2022 (Afternoon)

(a) Scheme 1 and 2 both

(b) Scheme 1

(c) Scheme 2

(d) Scheme 2 and 3 both

Q.2. A clock marked for ₹10,000 is available on successive discounts of 40% and k%. If the selling price of the clock is ₹2,400, then find the value of k.

Group D 26/08/2022 (Morning)

(a) 36% (b) 40% (c) 60% (d) 24%

Q.3. A single discount equivalent to successive discounts of 10%, 15%, and 20% is:

Group D 30/08/2022 (Afternoon)

(a) 45% (b) 36.6% (c) 40% (d) 38.8%

Q.4. Two successive discounts of 40% and 60% on a deal are equivalent to a single discount of:

Group D 01/09/2022 (Afternoon)

(a) 76% (b) 70% (c) 80% (d) 66%

Q.5. A trader gives 5% discount on the marked price of an article and gives 2 articles free for buying 14 articles and gains 33% in the entire transaction. Assuming a customer pays for 14 articles, the marked price of an article is what percent more than its cost price ?

Group D 02/09/2022 (Morning)

(a) 48% (b) 50% (c) 55% (d) 60%

Q.6. An article marked at Rs 500 is sold for Rs 303.60 after three successive discounts of 25%, 8% and x% are given. If the same article is sold at a single discount of (33 + x)%, then find its selling price (in Rs).

Group D 06/09/2022 (Evening)

(a) 280 (b) 285 (c) 300 (d) 275

Q.7. A shopkeeper offers a scheme of either selling articles at successive discounts of 30% and 20% or one where a customer can "buy 2, get 1 free". The positive difference in overall nominal percentage discounts offered in the two schemes is :

Group D 06/10/2022 (Morning)

(a) $11\frac{2}{3}\%$ (b) $10\frac{1}{3}\%$

(c) $11\frac{1}{3}\%$ (d) $10\frac{2}{3}\%$

Q.8. A dealer marks his goods 20% above the cost price. He then allows a discount on it and makes a profit of 8%. Find the rate of discount offered by the dealer.

NTPC CBT - I 17/02/2021 (Morning)

(a) 6% (b) 10% (c) 4% (d) 12%

Q.9. If a shopkeeper hikes the purchasing value of an item by 46% and gives it a discount of 46% on the face value for selling it, then what the total percentage gain or loss will it have ?

RPF S.I. 05/01/2019 (Morning)

(a) 21.16% profit (b) 20.04% Loss

(c) 20.04% Profit (d) 21.16% Loss

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.10. John bought a laptop at 25% discount on the marked price. If he paid 28,473 for the laptop, what was its marked price?

Group D 17/08/2022 (Morning)

(a) ₹ 37,946 (b) ₹37,496

(c) ₹37,694 (d) ₹ 37,964

Q.11. In a clearance sale, a sari whose marked price was Rs.10,490, is now sold for Rs.9,441. What is the discount percent on the sari ?

Group D 18/08/2022 (Morning)

(a) 15% (b) 10% (c) 18% (d) 12%

Q.12. An item costs Rs.2,000 less than Rs.5,000. The dealer offers a discount of 10% and the retailer further offers a discount of 5% on its CP. The final SP for the customer is:

Group D 18/08/2022 (Morning)

(a) Rs. 2,878 (b) Rs. 1,987

(c) Rs. 2,565 (d) Rs. 3,454

Q.13. The difference between the selling price on a discount of 32% and two successive discounts of 20% each on a

certain bill is Rs.25. Find the actual amount of the bill.
Group D 18/08/2022 (Evening)
(a) ₹425 (b) ₹576 (c) ₹200 (d) ₹625

Q.14. A shop which sells sarees had offers going on wherein customers could buy 3 sarees and get 2 free. What is the discount that the customer gets ?
Group D 22/08/2022 (Afternoon)
(a) 40% (b) 50% (c) 60% (d) 30%

Q.15. The marked price of a book is ₹900. A man bought the same for ₹693 after getting two successive discounts, the first being 12%. What was the second discount rate ?
Group D 26/08/2022 (Morning)
(a) 13.5% (b) 11.5% (c) 14.5% (d) 12.5%

Q.16. Three successive discounts of 4%, 5% and 14% are equal to a single discount of _____ (round off to two decimal places).
Group D 29/08/2022 (Afternoon)
(a) 22.57% (b) 20.57%
(c) 21.57% (d) 23.57%

Q.17. The shopkeeper offers 3 successive discounts on a washing machine that costs ₹58,000, so that the price gets reduced to ₹42,000. If 5%, 10% and x% are the respective discounts, find the value of x.
Group D 30/08/2022 (Morning)
(a) 12 (b) 10 (c) 15.3 (d) 9

Q.18. The marked price of an article is ₹1,200. The shopkeeper offered two successive discounts of 10% and 5% respectively to a customer. At what price did the customer purchase the article ?
Group D 30/08/2022 (Evening)
(a) ₹1,062 (b) ₹1,026
(c) ₹1,602 (d) ₹1,206

Q.19. X placed an order for 20 shirts marked for ₹750 each. The shopkeeper offered 20% discount on purchase of 20 shirts. He allowed a further discount of ₹500, as the payment was made in cash. Find the final selling price of each shirt, if the selling price of each shirt is the same ?
Group D 01/09/2022 (Morning)
(a) ₹575 (b) ₹625 (c) ₹550 (d) ₹650

Q.20. A shopkeeper has the following 3 schemes:
(I) Two successive discounts of 30% and 35%
(II) Buy 6, get 4 free
(III) Buy 5, get 6 free
Which scheme has the maximum discount percentage ?
Group D 01/09/2022 (Evening)
(a) Only III (b) Only I
(c) Only II (d) Both II and III

Q.21. A shopkeeper marks an article at ₹x and offers a discount of 20% on it. He sells it for ₹432 after charging VAT of 12.5% on the discounted price. What is the value of ₹x ?
Group D 02/09/2022 (Morning)
(a) ₹520 (b) ₹500 (c) ₹450 (d) ₹480

Q.22. A shopkeeper sells an item for ₹571.20 after giving two successive discounts of 20% and 15% on its marked price. Had he not given any discount, he would have earned a profit of 12%. What is the cost price (in ₹) of the item ?
Group D 05/09/2022 (Morning)
(a) 700 (b) 720 (c) 750 (d) 780

Q.23. The list price of a washing machine is ₹13,200. It is sold to a retailer after two successive discounts of 25% and 15%. The retailer wants to earn a profit of 20% on his cost after allowing a 25% discount (on its new list price) to the customer. At what price should he list the washing machine ?
Group D 05/09/2022 (Morning)
(a) 13,466 (b) 13,464
(c) 13,644 (d) 13,664

Q.24. A dealer buys two articles X and Y for ₹600 each. He marks each of them at the same price. He sells X by giving two successive discounts of 25% and 15% and still earns ₹216 as profit. If he sells Y at a single discount of 46%, then what is the profit percentage on Y ?
Group D 05/09/2022 (Afternoon)
(a) 15% (b) 14% (c) 14.5% (d) 15.2%

Q.25. A trader gains 25% by selling an article after two successive discounts of 25% and 10% on its marked price. If the cost price of the article is increased by 30%, then what single discount should he now give on the same marked price to get the same profit percentage as earlier ?
Group D 05/09/2022 (Evening)
(a) 10.5% (b) 12.5% (c) 10% (d) 12.25%

Q.26. A shopkeeper offers the following schemes on toys of same marked price.
(A) A successive discount of 12% and 15% on any number of toys purchased.
(B) successive discount of 15%, 10% and 2% on any number of toys purchased.
(C) 40% off on the first 3 toys, and 15% off on each subsequent toy.
(D) 2 toys free on purchase of 10 toys.
A lady customer wants to buy 10 toys. Which of the above schemes is most beneficial to her?
Group D 06/09/2022 (Morning)
(a) (A) (b) (C) (c) (D) (d) (B)

Q.27. The listed price of an article is ₹200. A customer purchases it at ₹150 after two successive discounts. If one discount is 10%, then the other discount percentage (rounded off to two decimal places) is:
Group D 09/09/2022 (Afternoon)
(a) 12.5% (b) 11.11% (c) 16.66% (d) 20%

Q.28. Which of the following two successive discounts are equivalent to a single discount of 84% ?
Group D 12/09/2022 (Afternoon)
(a) 30% and 70% (b) 20% and 80%
(c) 40% and 60% (d) 10% and 90%

Q.29. A bronze article having a marked price of ₹1,000 is sold during a festive season sale after three successive discounts of 20% and 30% and 10%. What will be the amount (in ₹) to be paid by a customer if she buys the article during the festival season ?
Group D 15/09/2022 (Morning)
(a) 564 (b) 496 (c) 508 (d) 504

Q.30. An article whose marked price is ₹ 800 is sold at a profit of 50% when there are successive discounts of 20%, 10%, and 5% offered by the shopkeeper. The selling price (rounded to the nearest rupee) when the article is sold at a profit of 60%, with the same cost price, is:
Group D 15/09/2022 (Afternoon)
(a) ₹504 (b) ₹604 (c) ₹584 (d) ₹684

Q.31. The marked price of an article is ₹400 and successive discounts of 10% and 12% are offered on its sale. The selling price of the article is:
Group D 18/09/2022 (Afternoon)
(a) ₹313.80 (b) ₹323.80
(c) ₹316.80 (d) ₹306.80

Q.32. What is the net discount, if two successive discounts of 10% and 12% are given ?
Group D 22/09/2022 (Morning)
(a) 21.4% (b) 20.8% (c) 23.2% (d) 22.0%

Q.33. Two successive discounts of 15% and X% on the sale of an item is equivalent to a single discount of 23.5%. What is the value of X% ?
Group D 22/09/2022 (Morning)
(a) 11% (b) 12% (c) 10% (d) 9%

Q.34. Find the single percentage discount equivalent to three successive discounts of 30%, 20% and 10% respectively.
Group D 26/09/2022 (Evening)
(a) 64.6% (b) 49.6% (c) 50.4% (d) 46.4%

Q.35. After two successive discounts, a tie with a list price of ₹120 is available at ₹90. If the second discount is 9%, what is the first discount percentage? [Give your answer correct to 2 places of decimal.]
Group D 27/09/2022 (Morning)
(a) 17.58% (b) 84.42%
(c) 71.58% (d) 63.33%

Q.36. Find the single percentage discount equivalent to three successive discounts of 30%, 20% and 10%.
Group D 27/09/2022 (Morning)
(a) 49.6% (b) 46.9% (c) 50.4% (d) 60%

Q.37. A tradesman allows a discount of 15% on the marked price. How much above the cost price must he mark his goods to gain 19% through the above transaction ?
Group D 28/09/2022 (Evening)
(a) 40% (b) 30% (c) 50% (d) 25%

Q.38. If a% is the first discount and b% is the second discount on the marked price of an article, then an equivalent single discount percentage is given by:
Group D 29/09/2022 (Afternoon)
(a) $a + b - \frac{ab}{100}$ (b) $a + b + \frac{ab}{100}$
(c) $a + b - \frac{a-b}{100}$ (d) $a + b - \frac{a+b}{100}$

Q.39. The marked price of a car is ₹5,00,000. Under a scheme successive discount of 10% and 8% are offered on it. Find the total discount offered while selling the car under the given scheme.
Group D 29/09/2022 (Afternoon)
(a) ₹90,000 (b) ₹76,000
(c) ₹86,000 (d) ₹82,000

Q.40. A shopkeeper sells a pair of shoes at a discount of 34% and still makes a profit of 10%. If the cost price of the pair of shoes is ₹480, find its marked price.
Group D 29/09/2022 (Evening)
(a) ₹850 (b) ₹820 (c) ₹800 (d) ₹700

Q.41. Goods are sold such that when a 5% discount is allowed, a profit of 33% is made. By what percentage is the list price more than the cost price ?
Group D 07/10/2022 (Afternoon)
(a) 25% (b) 30% (c) 35% (d) 40%

Q.42. During a sale, a TV shop owner offers four different types of successive discounts for any consumer to choose from. Which of the following options will give the best possible price to the shop owner as a percentage of the marked price of an item ?
Group D 11/10/2022 (Morning)
(a) 25% and 15% (b) 30% and 10%
(c) 35% and 5% (d) 20% and 20%

Q.43. The marked price of an article is ₹1,820 and its selling price is ₹1,420. Find the discount percentage. (Round the answer to the nearest whole number.)
Group D 11/10/2022 (Afternoon)
(a) 26% (b) 25% (c) 22% (d) 28%

Q.44. What is the discount percentage in the scheme of 'buy 5 get 3 free?
Group D 11/10/2022 (Evening)
(a) 60% (b) 39.25% (c) 37.5% (d) 36.5%

RRB NTPC CBT - 1 (28/12/2020 to 31/07/2021)

Q.45. To gain 25% after announcing a discount of 10%. the shopkeeper must mark the price of the article with cost price Rs 360 as:
RRB NTPC 07/01/2021 (Evening)
(a) Rs.500 (b) Rs.486
(c) Rs.450 (d) Rs.460

Q.46. Home Decor shop marked every item 30% higher than the actual cost price. The owner offers 10% discount on the marked price of each item. If a Sofa set is sold for Rs 23,400. How much profit did he earn ?
RRB NTPC 09/01/2021 (Evening)
(a) Rs.3,400 (b) Rs.3,978
(c) Rs.18,000 (d) Rs.20,000

Q.47. A company offers a 5% discount on cash purchase. How much would Darshan pay, in cash, for a bike purchased from the company, if the marked price is Rs. 75,200?
RRB NTPC 11/01/2021 (Morning)
(a) Rs.71,440 (b) Rs.74,000
(c) Rs.72,540 (d) Rs.70,450

Q.48. Anil buys an article with 20% discount on the market price and sells it at 8% discount on the market price. Find his profit/loss percent.
RRB NTPC 11/01/2021 (Evening)
(a) 12% loss (b) 12% profit
(c) 15% profit (d) 15% loss

Q.49. A dealer lists his goods at 40% above cost price and allows a discount of 20% . his profit is:
RRB NTPC 20/01/2021 (Evening)
(a) 10% (b) 20% (c) 40% (d) 12%

Q.50. If on a marked price, the difference between selling price with a discount of 45% and two successive discounts of 30% and 20% is Rs 84, then the marked price is _____.
RRB NTPC 30/01/2021 (Evening)
(a) Rs 8,400 (b) Rs 2,000
(c) Rs 3,000 (d) Rs 4,500

Q.51. Big Mart is offering a 5% discount on card payment. How much percentage above cost price should the marked price be so as to make a profit of 10%.
RRB NTPC 01/02/2021 (Evening)
(a) $14\frac{16}{19}\%$ (b) $16\frac{14}{19}\%$
(c) $15\frac{5}{19}\%$ (d) $15\frac{15}{19}\%$

Q.52. If the selling price of Rs 36 results in a 10% discount on a list price, what selling price will results in a 20% discount on the list price ?
RRB NTPC 03/02/2021 (Morning)
(a) Rs.36 (b) Rs.50 (c) Rs.32 (d) Rs.60

Q.53. A salesman offers 20% additional discount , after offering an initial discount of 25% on the labelled rate of a laptop. If the final sale price of the laptop is Rs 18,000, then what was its labelled rate ?
RRB NTPC 15/02/2021 (Evening)
(a) Rs 40,000 (b) Rs 28,000
(c) Rs 35,000 (d) Rs 30,000

Q.54. A man purchased a fan which had a printed price of Rs. 200. If he received two successive discounts of 30% and 20%, then how much did he pay for the fan ?
RRB NTPC 07/03/2021 (Morning)
(a) Rs.115 (b)Rs.108 (c) Rs.112 (d) Rs.90

Q.55. Ramu purchased a TV set with an additional 15% discount on the reduced price after deducting 25% discount on the labeled price. If the labeled price was Rs. 12,000, at what price did he purchase the TV set?
RRB NTPC 11/03/2021 (Morning)
(a) Rs. 7,650 (b) Rs. 7,000
(c) Rs. 7,560 (d) Rs. 7,600

RRB JE (22/05/2019 to 28/06/2019)

Q.56. A shopkeeper gives a discount of 10% once in 4 months. If a man purchases an article in this scheme for Rs.25515 in December, then what was the initial price in January ?
RRB JE 22/05/2019 (Evening)
(a) Rs.40000 (b) Rs.35000
(c) Rs.45000 (d) Rs.36000

Q.57. Two successive discounts of 10% and 20% are advertised in a sale. If there is an additional 5% discount on cash payment, what is the overall discount, if the purchase is done by cash ?
RRB JE 26/06/2019 (Morning)

(a) 40% (b) 35% (c) 31.6% (d) 32%

Q.58. Determine the actual profit per cent from the given details.
1. With no discount, the profit would have been 20%
2. However a 5% discount is offered
RRB JE 26/06/2019 (Morning)
(a) 15% (b) 12% (c) 14% (d) 20%

RPF S.I. (19/12/2018 to 16/01/2019)

Q.59. A shopkeeper gives a discount of 34% on the sale of an article after marking it 34% above the cost price. Then find the total percentage profit or loss made by him.
RPF S.I. 24/12/2018 (Morning)
(a) 11.56% (b) 10.24%
(c) 9.84% (d) 12.64%

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.60. The rate of discount on an article whose marked price is ₹170 and selling price is ₹130 is :
RRB ALP 17/08/2018 (Morning)
(a) 23.60% (b) 24.26%
(c) 23.53% (d) 22.45%

Answer Key :-

1.(b)	2.(c)	3.(d)	4.(a)
5.(d)	6.(d)	7.(d)	8.(b)
9.(d)	10.(d)	11.(b)	12.(c)
13.(d)	14.(a)	15.(d)	16.(c)
17.(c)	18.(b)	19.(a)	20.(a)
21.(d)	22.(c)	23.(b)	24.(d)
25.(d)	26.(a)	27.(c)	28.(b)
29.(d)	30.(c)	31.(c)	32.(b)
33.(c)	34.(b)	35.(a)	36.(a)
37.(a)	38.(a)	39.(c)	40.(c)
41.(d)	42.(d)	43.(c)	44.(c)
45.(a)	46.(a)	47.(a)	48.(c)
49.(d)	50.(a)	51.(d)	52.(c)
53.(d)	54.(c)	55.(a)	56.(b)
57.(c)	58.(c)	59.(a)	60.(c)

Solution:-

Sol.1.(b) Overall discount in Scheme 1
$= \frac{3}{8} \times 100 = 37.5\%$
Overall discount in Scheme 2 = $\frac{1}{6} \times 100$
$= 16.66\%$
Overall discount in Scheme
3 = 10 + 5 - $\frac{10 \times 5}{100} = 14.5\%$
So, the most beneficial Scheme is Scheme 1.

Sol.2.(c) After first discount, SP = 10000 × $\frac{60}{100}$ = 6000
Now, second discount = 6000 - 2400 = 3600
Required % = $\frac{3600}{6000}$ × 100 = 60 %

Sol.3.(d) 10% = $\frac{1}{10}$,15% = $\frac{3}{20}$, 20% = $\frac{1}{5}$
10 : 9
20 : 17
5 : 4
1000 : 612
Single discount = $\frac{388}{1000} \times 100 = 38.8\%$

Sol.4.(a) Equivalent discount
= 40 + 60 - $\frac{40 \times 60}{100}$ = 76%

Sol.5.(d) First discount = 5%
Second discount = $\frac{2}{16} \times 100 = 12.5\%$
Overall discount = $5 + 12.5 - \frac{5 \times 12.5}{100}$
$= 16.875\%$
C.P = (100 - 16.875) = 83.125
M.P = 100 + 33 = 133
Difference between CP and M P = 133 - 83.125 = 49.875
Required % = $\frac{49.875}{83.125} \times 100 = 60\%$

Sol.6.(d) According to the question,
500 × $\frac{75}{100}$ × $\frac{92}{100}$ × $\frac{100 - x}{100}$ = 303.6
⇒ $\frac{100 - x}{100}$ = 0.88 ⇒ So, x = 12%
Now, new discount = (33 + 12) = 45%
New SP = 500 × $\frac{55}{100}$ = ₹275

Sol.7.(d)
Successive discounts = 30% and 20%
Effective discount percentage
= 30 + 20 - $\frac{30 \times 20}{100}$ = 44%
Discount in another scheme = Buy 2 get 1 free
Effective discount = $\frac{1}{2+1} \times 100 = 33\frac{1}{3}\%$
Required difference = 44 - $33\frac{1}{3} = 10\frac{2}{3}\%$

Sol.8.(b) CP : SP = 100 : (100+8)
MP = 100 + 20 = 120
Discount = 120 - 108 = 12
% discount = $\frac{12}{120} \times 100 = 10\%$

Sol.9.(d) Let the C.P. of article be 100 , then M.P. of the article be 146
Now, S.P. = $\frac{146 \times 54}{100}$ = 78.84
Loss% = 100 - 78.84 = 21.16
Short Tricks :-
If markup (m%) and discount (d%) is same , Then Profit / Loss % = $\frac{m \times d}{100}$
⇒ $\frac{(+46\%)(-46\%)}{100}$ = -21.16%
Here (-) indicate Loss

Sol.10.(d) Discount = 25% = $\frac{1}{4}$
So MP : SP
4 : 3
3 units = ₹28,473
4 units = $\frac{28473}{3}$ × 4 = ₹ 37,964

Sol.11.(b) Discount % = $\frac{10490 - 9441}{10490}$
$\times 100 = \frac{1049}{10490} \times 100 = 10\%$

Sol.12.(c) Cost of item
= 5000 - 2000 = ₹3000
S.P of the item
= $\frac{90}{100} \times \frac{95}{100} \times 3000 = ₹2,565$

Sol.13.(d) Successive discounts of 20%
= $A + B - \frac{AB}{100}$
= $20 + 20 - \frac{20 \times 20}{100} = 36\%$
Now, $\frac{68x}{100} - \frac{64x}{100} = 25$
⇒ $\frac{4x}{100} = 25 \Rightarrow x = \frac{25 \times 100}{4} = ₹625$

Sol.14.(a)
Discount % = $\frac{2}{5} \times 100 = 40\%$

Sol.15.(d) Let the second discount = x %
After getting first discount (SP)
= 900 × $\frac{88}{100}$ = 792
Therefore (x) = $\frac{792 - 693}{792}$ × 100
⇒ $\frac{99}{792}$ × 100 = 12.5%

Sol.16.(c)

4% discount mean	25 : 24
5% discount mean	20 : 19
14% discount mean	50 : 43
	25000 : 19608
Overall discount	3125 : 2451
	674

Single discount = $\frac{674}{3125} \times 100$

= 21.57%

Sol.17.(c) Overall discount%

= $\frac{58000-42000}{58000} \times 100 = 27.58\%$

20 : 19

10 : 9

100 : 100 - x

20000 : 17100 - 171x

Now,

$\frac{20000-17100+171x}{20000} \times 100 = 27.58$

$\Rightarrow 2900 + 171x = 5516$

$\Rightarrow 171x = 5516 - 2900$

$\Rightarrow x = \frac{2616}{171} = 15.3\%$

Sol.18.(b)

M.P	S.P
10 :	9
20 :	19
200 :	171
X6	X6
1200	1026

Marked price of the article = 200 units

= ₹1200 ⇒1 unit = 6

S.P of the article = 171 units = 171 x 6

= ₹1,026

Sol.19.(a) S.P of 20 shirts after 20% discount = $\frac{80}{100} \times 20 \times 750 = ₹12,000$

Now,S.P. after another discount of Rs.500 for payment in cash

= 12000 - 500 = ₹11,500

S.P of each shirts = $\frac{11500}{20}$ = ₹575

Sol.20.(a) Successive discount of 30% and 35% = 30 + 35 – $\frac{30 \times 35}{100} = 54.5\%$

S.P = 6 , M.P = 10 then D%

= $\frac{4}{10} \times 100 = 40\%$

S.P = 5 , M.P = 11 then D%

= $\frac{6}{11} \times 100 = 54.54\%$

Only in third case , discount is maximum.

Sol.21.(d) 20% = $\frac{1}{5}$ *and* $12.5\% = \frac{1}{8}$

	M.P.	:	S.P.
- 20%	→ 5	:	4
+12.5%	→ 8	:	9
	40	:	36

So the final ratio of M.P. and S.P.

= $\frac{40}{36} = \frac{10}{9}$

9 units = ₹432 ⇒ 1 unit = 48

The marked price of the article = 10 units

= 10 x 48 = ₹ 480

Sol.22.(c)

	M.P.	S.P.
- 20%	→ 5	4
- 15%	→ 20	17
	100	68

Selling price of the item

= 68 units = 571.20

1 unit = 8.4

Marked price of the item = 100 units

= ₹840

Then C.P of the item = $\frac{100}{112} \times 840$ = ₹750

Sol.23.(b) List price of the washing machine = ₹13,200

S.P = $13200 \times \frac{75}{100} \times \frac{85}{100} = ₹8415$

New S.P after 20 % profit

= $\frac{120}{100} \times 8415 =$ ₹10098

Now , List price marked by the retailer

= $\frac{100}{75} \times 10098 = ₹13,464$

Sol.24.(d) Let the marked price ₹100 on both articles.

S.P of article X = $\frac{3}{4} \times \frac{17}{20} \times 100$

= ₹ 63.75

But, He earns a profit of ₹216 then ,

S.P = 600 + 216 = ₹816

Now, 63.75 corresponds to 816

Then 100 corresponds to $\frac{816}{63.75} \times 100$

= ₹1280

Now, Marked price for the Y article is also ₹ 1280

S.P for article Y = $\frac{54}{100} \times 1280 =$ ₹691.20

Now, C.P of article Y = ₹600 and S.P

= ₹691.20

Profit % = $\frac{691.2 - 600}{600} \times 100$

= $\frac{91.2}{600} \times 100 = 15.2\%$

Sol.25.(d) Let the CP = 100 unit

S.P. = $100 \times \frac{125}{100}$

So , MP = $100 \times \frac{125}{100} \times \frac{100}{75} \times \frac{100}{90}$

= 185.2

As per the question,

New CP = 130

And, New SP = $130 \times \frac{125}{100}$=162.5

Required discount =

$\frac{185.2 - 162.5}{185.2} \times 100 = 12.25\%$

Sol.26.(a) Scheme (A): Equivalent discount of 12% and 15%

= 12 + 15 - $\frac{12 \times 15}{100} = 25.2\%$

Scheme (B): Equivalent discount of 15% and 10% = $15 + 10 - \frac{15 \times 10}{100} = 23.5\%$

Equivalent discount of 15%, 10% and 2%

= $23.5 + 2 - \frac{23.5 \times 2}{100} = 25.03\%$

Scheme (C): Equivalent discount

= $\frac{40 \times 3 + 15 \times 7}{3+7} = 22.5\%$

Scheme(D): discount = $\frac{2}{2+10} \times 100$

$= 16.66\%$

Scheme (A) is most beneficial to her as it gives maximum discount.

Sol.27.(c) Price after first discount

= 200 × $\frac{90}{100}$ = 180

required discount = $\frac{180 - 150.}{180}$ × 100

=16.66%

Sol.28.(b) By observation options,

From option (b)

20 + 80 - $\frac{20 \times 80}{100}$ = 84%

It satisfies,

Option **(b)** is the correct answer

Sol.29.(d) marked price of a bronze article = ₹1,000

Therefore, cost price for the customer

= $1000 \times \frac{100-20}{100} \times \frac{100-30}{100} \times \frac{100-10}{100}$

= $1000 \times \frac{80}{100} \times \frac{70}{100} \times \frac{90}{100}$ = 504

Sol.30.(c) Marked price of the article = ₹800

Now, S.P after successive discounts

= $800 \times \frac{4}{5} \times \frac{9}{10} \times \frac{19}{20} = ₹547.20$

Original C.P of the article

= $\frac{100}{150} \times 547.20 = ₹364.80$

Now, New S.P = $\frac{160}{100} \times 364.80 = ₹584$

Sol.31.(c) Given, marked price of the article = ₹400

S.P = $\frac{90}{100} \times \frac{88}{100} \times 400 = ₹316.80$

Sol.32.(b) Net discount

= 10 + 12 - $\frac{10 \times 12}{100} \Rightarrow$ 22 - 1.2 = 20.8%

Alternet method:

SP		CP
10	:	9
25	:	22
250	:	198

Required percentage

= $\frac{250 - 198}{250}$ × 100 = 20.8%

Sol.33.(c)

Let the Marked price = 100 unit

According to the question,

$100 \times \frac{100-15}{100} \times \frac{100-x}{100}$

$\Rightarrow 100 \times \frac{100-23.5}{100}$

$\Rightarrow 85 \times (100 - x) = 7650$

$\Rightarrow$ 8500 - 85x = 7650 $\Rightarrow$ 85x = 850

Therefore, required percentage (x) = 10%

Sol.34.(b)

Original price	:	Discounted price
10	:	7
5	:	4
10	:	9
500	:	252

Overall discount = 500 - 252 = 248

Discounted percentage = $\frac{248}{500} \times 100$

= 49.6%

Sol.35.(a) Let the first discount be x%

ATQ ,

$120 \times \frac{100-x}{100} \times \frac{91}{100} = 90$

$\Rightarrow 4 \times \frac{100-x}{100} \times \frac{91}{100} = 3$

$\Rightarrow$ 9100 - 91x = 3 × 25 × 100

$\Rightarrow$ 91x = 1600

Therefore first discount (x) = 17.58 %

Sol.36.(a) Successive Discount

= 30 + 20 - $\frac{30 \times 20}{100}$ $\Rightarrow$ 50 - 6 = 44%

Now,

44 + 10 - $\frac{44 \times 10}{100}$ $\Rightarrow$ 54 - 4.4 = 49.6 %

Sol.37.(a) Let the cost price be 100 unit

ATQ,

MP × $\frac{100 - D\%}{100}$ = Selling Price

MP × $\frac{85}{100} = \frac{100 \times 119}{100}$ = 140

Required percentage = $\frac{140-100}{100}$ × 100

= 40%

Sol.38.(a) Equivalent discount

= a + b - $\frac{a \times b}{100}$

Sol.39.(c) Marked price = 5,00,000

Successive discounts = 10% and 8%

Selling price 5,00,000 × $\frac{90}{100} \times \frac{92}{100}$

= 4,14,000

Discounts = 5,00,000 - 4,14,000

= Rs.86,000

Sol.40.(c) Discount = 34%

Profit = 10%

Cost price = 480

Selling price = 480 × $\frac{110}{100}$ = 528

Marked price = 528 × $\frac{100}{66}$ = 800

Hence, Marked price = 800

Sol.41.(d) Discount = 5%

Profit = 33%

Cost price = 100

Selling price = 133

Marked price = 133 × $\frac{100}{95}$ = 140

Required percentage

= $\frac{140-100}{100} \times 100$ = 40%

Sol.42.(d)(a) 25% and 15%

Effective discount = 25 + 15 - $\frac{25 \times 15}{100}$ = 36.25%

(b) 30% and 10%

Effective discount = 30 + 10 - $\frac{30 \times 10}{100}$ = 37%

(c) 35% and 5%

Effective discount = 35 + 5 - $\frac{35 \times 5}{100}$ = 38.25%

(d) 20% and 20%

Effective discount = 20 + 20 - $\frac{20 \times 20}{100}$ = 36%

So, option (d) will be the best price.

Sol.43.(c) Marked price = 1820

Selling price = 1420

Discount = 1820 - 1420 = 400

Discount percentage = $\frac{400}{1820} \times 100$

= 21.97% or 22%

Sol.44.(c) Let the price of each article = 1 unit

Discount = 3

Total article = 5 + 3 = 8

Discount percent = $\frac{3}{8}$ × 100 = 37.5%

Sol.45.(a) Profit = 25%= $\frac{1}{4}$, Discount

= 10% = $\frac{1}{10}$

CP	SP	MP
4	5	
	9	10

4×9	5×9	5×10
36	45	50

The CP = 36 in ratio whose value is given Rs360

$\therefore$MP = $\frac{360}{36}$ × 50 = Rs500

Sol.46.(a) Let the CP = 100

MP = 130

10% discount is offered, therefore

SP = 117

And the SP is given Rs 23,400

$\Rightarrow$ 117 = 23,400, 1 = 200

Profit = 117 - 100 = 17 $\Rightarrow$ 17 × 200

= Rs. 3,400

Sol.47.(a)

SP of Bike = 75200 × $\frac{95}{100}$ = Rs 71,440

Sol.48.(c) Let the MRP of article = 100

D = 20% , C.P. for Anil = 80

D = 8%, SP = 92

Profit = 92 - 80 = 12

Profit% = $\frac{12}{80} \times 100$ = 15%

Sol.49.(d)

CP		SP		MP
100	:	112	:	140

Profit = $\frac{112-100}{100} \times 100$ =12%

Sol.50.(a) Let , MP = 100 , Discount % = 45% then SP = 55

ATQ , Two successive discounts of 30% and 20% = - 30 - 20 + $\frac{30 \times 20}{100}$ = 44%

Difference between two discount = 84 rs

45% - 44% = 84 Rs

1% = 84

100%(MP) = 8400 Rs

Sol.51.(d) 10% = $\frac{1}{10}$ and 5% = $\frac{1}{20}$

CP : SP = 10 : 11

SP : MP = 19 : 20

CP : SP : MP = 190 : 209 : 220

Difference between CP and MP = 30

Effective discount % = $\frac{30}{190} \times 100$ =15$\frac{15}{19}$%

Short Trick:

$\frac{C.P.}{M.P.} = \frac{100 - D\%}{100 + P\%}$

$\Rightarrow \frac{C.P.}{M.P.} = \frac{100-5}{100+10} = \frac{95}{110}$ = 15$\frac{15}{19}$%

Sol.52.(c) Let list price = 100

D = 10% = 10, SP = 90

D = 20% = 20, SP = 80

90 unit = Rs 36

80 unit = $\frac{36}{90} \times 80 = Rs\ 32$

Sol.53.(d) Let , labelled price = x

Initial discount = 25%

Price after initial discount = $\frac{75x}{100}$

Additional discount = 20%

Price after additional discount

= $\frac{75x}{100} \times \frac{80}{100} \Rightarrow \frac{75x}{100} \times \frac{80}{100}$ =18000

$\frac{6x}{10}$ = 18000 $\Rightarrow$ x = 30000 Rs

Alternate Method:

Successive Discount

= 20 + 25 − $\frac{20 \times 25}{100}$ = 40%

So, 60% = 18000

Now, 100% = $\frac{18000}{60} \times 100$ = Rs 30,000

Sol.54.(c) Equivalent discount = - 30 - 20 + $\frac{30 \times 20}{100}$ = - 30 - 20 + 6 = - 44%

SP = $\frac{200}{100} \times 56 = Rs\ 112$

Sol.55.(a) Equivalent discount = - 15 - 25 + $\frac{15 \times 25}{100}$ = - 40 + 3.75 = - 36.25%

If MP =100

D = 36.25

SP = 100 - 36.25 = 63.75

A/Q,

SP = $\frac{12000}{100} \times 63.75$ = Rs 7650

Alternate Approach:

25% = $\frac{1}{4}$

15% = $\frac{3}{20}$

Marked Price	:	selling Price
4	:	3
20	:	17
80	:	51

80 unit = 12000

1 unit = 150

So Selling Price is 51 unit = 51 × 150

= Rs 7650

Sol.56.(b) Initial price × $\frac{9}{10} \times \frac{9}{10} \times \frac{9}{10}$

= 25515 Rs.

Initial price = $\frac{25515}{729} \times 1000$

= 35,000 Rs.

Sol.57.(c)

Let the article mark price is 100, then

100 × $\frac{(100-10)}{100} \times \frac{(100-20)}{100}$

$= 100 \times \frac{90}{100} \times \frac{80}{100}$ = 72

then according to question , additional discount is 5%

$\Rightarrow 72 \times \frac{(100-5)}{100} = 72 \times \frac{95}{100}$

⇒ 68.40 (S.P.) ,

then discount is (100 - 68.40) = 31.6 %

Short Tricks :-

Net discount of (10% and 20%)

= 10 + 20 − $\frac{10 \times 20}{100}$ = 28%

Net equivalent discount of (28% and 5%)

= 28 + 5 − $\frac{28 \times 5}{100}$ = 33 −1.4 = 31.6%

Sol.58.(c) Let ,C.P. of an article is 100 then, Selling Price = 120 ,

Selling price after 5% discount

= 120 × $\frac{95}{100}$ = 114

Actual profit % = $\frac{114-100}{100}$ × 100 = 14%.

Sol.59.(a) Let the C.P. of article = 100 , then M.P. of the article = 134

Now, S.P. = $\frac{134 \times 66}{100}$ = 88.44

Loss = 100 - 88.44 = 11.56%

Short Trick :-

If markup (m%) and discount (d%) is same , Then Profit / Loss % = $\frac{m \times d}{100}$

$\Rightarrow \frac{(+34\%)(-34\%)}{100}$ = -11.56%

Here (-) indicates loss.

Sol.60.(c) Discount% = $\frac{170-130}{170}$ × 100

= $\frac{40}{170}$ × 100 = $\frac{400}{17}$ = 23.53%

Simple Interest

Key Points:-

1. Simple Interest on a sum (principal) of money at R% per annum for T years is given by:

$$SI = \frac{Principal \times Rate \times Time}{100} = \frac{PRT}{100}$$

2. Amount (A) = Principal + S.I.

3. Also, $P = \frac{SI \times 100}{R \times T}$, $T = \frac{SI \times 100}{R \times P}$, $R = \frac{SI \times 100}{P \times T}$

Example: A man lends Rs. 500 at 10% per annum for 2 years. His interest will be:

Solution: Here, P = Rs. 500, R = 10% and T = 2 years.

$$SI = \frac{PRT}{100} = \frac{500 \times 10 \times 2}{100} = Rs.\ 100$$

Important Note :

1) Notice that in the formula, $SI = \frac{PRT}{100}$, we are just calculating $(T \times R)\%$ of P.

2) Simple Interest increases linearly with the number of years i.e. to get SI for 1 year ,you can directly divide given interest by the number of years.

Example: If SI is Rs. 400 for 4 years, then it will be Rs. 200 for 2 years.

3) Annual Instalment in SI

$$= \frac{100A}{100t + \frac{rt(t-1)}{2}}$$

Where, A = Amount borrowed, t = Time period, r = Interest rate

Variety Questions

Q.1. Find the simple interest on 2,000 at 8.25% per annum for the period from 7 February 2022 to 20 April 2022.
Group D 17/08/2022 (Morning)
(a) 35 (b) 31 (c) 37 (d) 33

Q.2. At simple interest, a certain sum of money amounts to ₹1,250 in 2 years and to ₹2,000 in 5 years. Find the rate of interest per annum (rounded off to two places of decimal).
Group D 17/08/2022 (Afternoon)
(a) 11.11% (b) 33.33%
(c) 16.67% (d) 27.27%

Q.3. Two banks, A and B, offered loans at 4.5% and 5.5% per annum, respectively. Ramesh borrowed an amount of ₹ 2,00,000 from each bank. Find the positive difference in the amounts of simple interest paid to the two banks by Ramesh after 2 years.
Group D 25/08/2022 (Morning)
(a) ₹2,000 (b) ₹4,000
(c) ₹8,000 (d) ₹6,000

Q.4. Raghav's monthly salary is ₹18,000. Raghav took a loan of ₹30,000 on simple interest for 3 years at the rate of 5% per annum. The amount that he will be paying as simple interest in 3 years is what percentage of his monthly salary?
Group D 14/09/2022 (Evening)
(a) 35% (b) 20% (c) 30% (d) 25%

Q.5. How many years will it take for a certain sum to get doubled at the rate of $6\frac{1}{4}$% simple interest per annum?
Group D 15/09/2022 (Morning)
(a) 16 (b) 8.4 (c) 4 (d) 6.25

Q.6. Surbhi invested a total sum of ₹47,740 in three schemes A, B and C such that the simple interest received from scheme A at 10% p.a. after 3 years, from scheme B at 9% p.a. after 4 years and from scheme C at 8% p.a. after 5 years were the same. What is the positive difference (in ₹) between the sums invested in schemes C and A?
Group D 30/09/2022 (Afternoon)
(a) 4,620 (b) 3,080 (c) 1,540 (d) 3,840

Q.7. A sum increases by 75% in 10 years at a certain rate of simple interest per annum. By what percentage will the same sum increase in 6 years at the same rate of simple interest per annum ?
NTPC CBT II Level 6 (09/05/2022) Shift 1
(a) 42% (b) 45% (c) 38% (d) 48%

Q.8. Suresh borrows ₹80000 at 24% per annum simple interest and Ramesh borrows ₹91000 at 20% per annum simple interest. In how many years will their amounts of debts be equal ?
NTPC CBT II Level 2 (13/06/2022) Shift 2
(a) 22 (b) 20 (c) 11 (d) 10

Q.9. Rachel borrowed ₹10,000 at 10% simple interest per annum. She paid back ₹3,000 after Year 1, ₹ 2,800 after year 2 and the remaining amount due after Year 3. If interest was charged on reducing balance, what was the amount Rachel paid as the final installment ?
NTPC CBT II Level 5 (15/06/2022) Shift 2
(a) ₹7,200 (b) ₹6,600
(c) ₹4,620 (d) ₹5,850

Q.10. A person invested some amount at the rate of 12% per annum simple interest and another amount at the rate of 10% per annum simple interest. He received yearly interest of Rs 125 from both the investments. But if he had interchanged the amounts invested. He would have received Rs 3 more as interest. How much did he invest at 10% per annum simple interest originally ?
NTPC CBT II Level 2 (16/06/2022) Shift 3
(a) 650 (b) 500 (c) 700 (d) 600

Q.11. Ramesh sharma borrows Rs 8,000 for 3 years at 5% p.a. simple interest. He lends it to Manohar at 7% p.a. for 3 years. Find his gain?
NTPC CBT - I 08/01/2021 (Evening)
(a) Rs. 580 (b) Rs. 480
(c) Rs. 450 (d) Rs. 460

Q.12. Balaji invested $\frac{1}{7}$ of his total investment at 4%, $\frac{1}{2}$ at 5% and the rest at 6% for 1 year. He received a total interest of Rs.730. What was the total sum invested?
NTPC CBT - I 21/01/2021 (Evening)
(a) Rs.24,000 (b) Rs.14,000
(c) Rs. 7,000 (d) Rs, 38,000

Q.13. How much money (in Rs.) at compound interest will amount to Rs. 5,000 in 3 years if the rate of interest is 2% for the 1st year, 3% for the 2nd year and 4% for the 3rd year?
NTPC CBT - I 16/02/2021 (Morning)
(a) $\frac{5000}{1.2 \times 1.3 \times 1.4}$ (b) 5000
(c) $\frac{5000}{1.09}$ (d) $\frac{5000}{1.2\,4}$

Q.14. Mr Ram invests an amount of Rs. 12,200 at the rate of 2% per annum for 4 years to obtain a simple interest. Later he invests the principal as well as the amount obtained as simple interest for another 4 years at the same rate of interest. What amount of simple interest will he get at the end of the last 4 years?
NTPC CBT - I 23/02/2021 (Morning)
(a) Rs.1,054.00 (b) Rs.1,056.07
(c) Rs.1,054.08 (d) Rs.1,055.08

Q.15. A man invests money in three different schemes for 6 years, 10 years and 12 years, at 10%, 12% and 15% simple interest , respectively. If at the completion of each scheme, he gets the same interest then the ratio of the respective investments is:
NTPC CBT - I 01/03/2021 (Morning)
(a) 7:4:3 (b) 5:4:3 (c) 6:3:2 (d) 4:3:2

Q.16. A person invested $\frac{1}{4}$ of his capital at $3\frac{1}{2}$%, $\frac{1}{3}$ at $7\frac{1}{2}$% and the remaining

at 8% simple interest. If the amount of the yearly simple interest is Rs. 2,576 then what is the amount of the capital?
NTPC CBT - I 14/03/2021 (Morning)
(a) Rs. 36800 (b) Rs. 39500
(c) Rs. 38400 (d) Rs. 27600

Q.17. If a sum invested at simple interest triples itself in 8 years, how many times of itself will it be in 12 years?
NTPC CBT - I 15/03/2021 (Morning)
(a) 4 times (b) 3.5 times
(c) 3 times (d) 5 times

Q.18. A sum of money when invested for 7.2 years gives Rs5,768 as the amount on maturity. If the Simple rate of Interest was 2% per annum more than what it was, the amount on maturity would have been Rs 6,272. The original sum invested was:
NTPC CBT - I 23/07/2021 (Morning)
(a) Rs. 3,500 (b) Rs. 4,000
(c) Rs. 3,250 (d) Rs. 3,750

Q.19. The Simple Interest for the first 2 years is 6%, next 2 years is 7% and for any number of years exceeding 4 years is 8%. Find the total interest on a principal 'P' at the end of 7 years.
RRB JE 31/05/2019 (Afternoon)
(a) $\frac{3P}{2}$ (b) $\frac{P}{2}$ (c) P (d) 2P

Q.20. A sum of money was invested at the rate of 7.5% simple interest per annum for 4 years. If the investment was for 5 years, the interest earned would have been ₹ 375 more. What was the initial sum invested?
RRB ALP Tier - I 09/08/2018 (Afternoon)
(a) ₹4,500 (b) ₹5,000
(c) ₹4,750 (d) ₹3,750

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.21. A man invested Rs.75,000 at the rate of $7\frac{1}{2}$% per annum simple interest for 6 years. Find the amount he will receive after 6 years.
Group D 17/08/2022 (Evening)
(a) Rs. 69,600 (b) Rs. 75,000
(c) Rs. 1,12,500 (d) Rs. 1,08,750

Q.22. A sum, when invested at $12\frac{1}{2}$% simple interest per annum, amounts to ₹8,250 after 2 years. What is the simple interest ?
Group D 18/08/2022 (Evening)
(a) ₹1,910 (b) ₹1,650
(c) ₹1,700 (d) ₹1,820

Q.23. Rani borrowed an amount of Rs.2,00,000 from the bank to start a business. How much simple interest will she pay at the rate of 7% per annum after 2 years?
Group D 22/08/2022 (Morning)
(a) Rs. 26,000 (b) Rs. 28,500
(c) Rs. 28,000 (d) Rs. 24,000

Q.24. Ramesh invested ₹1,232 at 5% p.a. rate of simple interest in a bank. What amount will he get after 3 years?
Group D 22/08/2022 (Evening)
(a) ₹1,285.80 (b) ₹2,145.80
(c) ₹1,848.80 (d) ₹1,416.80

Q.25. If the simple interest on a certain sum for 18 months at 5.5% per annum exceeds the simple interest on the same sum for 14 months at 6% per annum by ₹ 62.50, then the sum is:
Group D 23/08/2022 (Afternoon)
(a) Rs.8,200 (b) Rs.5,000
(c) Rs.6,500 (d) Rs.7,000

Q.26. The simple interest received on a sum of money in 12 years is equal to $\frac{3}{5}$ of the principal. Find the annual interest rate.
Group D 24/08/2022 (Afternoon)
(a) 8% (b) 5% (c) 7% (d) 6%

Q.27. In how much time will a sum of money double itself at 10 percent per annum rate of simple interest?
Group D 25/08/2022 (Afternoon)
(a) 8 years (b) 12 years
(c) 5 years (d) 10 years

Q.28. A sum was invested at a certain rate of simple interest per annum for 2 years. Had it been Invested at 2% per annum more than the existing rate, the simple interest accrued in the 2 years would have been ₹240 more. Find the sum invested.
Group D 25/08/2022 (Evening)
(a) ₹6,000 (b) ₹8,000
(c) ₹24,000 (d) ₹16,000

Q.29. A trader owes a merchant ₹8,000 due in one year. The trader wants to settle the account after 2 months. If the rate of interest is 9% per annum, then how much should he pay (rounded off value)?
Group D 29/08/2022 (Evening)
(a) ₹7,442 (b) ₹4,774
(c) ₹7,244 (d) ₹ 7,424

Q.30. Bharat borrowed a sum of ₹10,000 at a certain rate of simple interest for 2 years. If he paid an interest of ₹2,000 at the end of the period, then find the rate of interest per annum.
Group D 30/08/2022 (Morning)
(a) 15% (b) 25% (c) 20% (d) 10%

Q.31. A trader owes a merchant ₹10,500 due in one year. The trader wants to settle the account after four months. If the rate of interest is 6% per annum, then how much should he pay (rounded off value)?
Group D 30/08/2022 (Evening)
(a) ₹11,069 (b) ₹11,096
(c) ₹10,069 (d) ₹10,096

Q.32. If the simple interest on ₹4,800 at 15% per annum for 'n' years is ₹2,160, then find the value of 'n'.
Group D 02/09/2022 (Morning)
(a) 4 (b) 5 (c) 3 (d) 6

Q.33. The simple interest on a certain sum for $4\frac{2}{5}$ years at the rate of 9.5% p.a. is ₹3,553. What will be the amount payable on the same sum at 8.4% p.a. simple interest in $7\frac{1}{2}$ years?
Group D 02/09/2022 (Afternoon)
(a) 13,950 (b) 13,855
(c) 14,855 (d) 13,850

Q.34. If the simple interest on a certain sum for 8 years is $\frac{11}{25}$ of the sum, then the rate of interest per annum is:
Group D 05/09/2022 (Morning)
(a) $7\frac{1}{2}$% (b) $6\frac{1}{2}$% (c) $8\frac{1}{2}$% (d) $5\frac{1}{2}$%

Q.35. At what annual rate of simple interest will a sum of ₹ 7,500 amount to ₹ 9,250 in 7 years?
Group D 06/09/2022 (Morning)
(a) $3\frac{1}{3}$% (b) $4\frac{1}{3}$% (c) $5\frac{1}{3}$% (d) $6\frac{1}{3}$%

Q.36. A sum of ₹5,800 is invested at 6% per annum simple interest. How much will the sum become after 4 years?
Group D 08/09/2022 (Morning)
(a) ₹9,192 (b) ₹8,192
(c) ₹6,192 (d) ₹7,192

Q.37. The sum lent at the rate of 25% per annum simple interest, that produces interest of ₹2.00 a day, for a year of 365 days, is:
Group D 12/09/2022 (Morning)
(a) ₹2,820 (b) ₹2,920
(c) ₹2,902 (d) ₹2,800

Q.38. The simple interest on a sum for 3 years is two-fifth of the sum. The rate of interest per annum is:
Group D 12/09/2022 (Evening)
(a) $\frac{3}{40}$% (b) $\frac{40}{3}$% (c) $\frac{10}{3}$% (d) $\frac{20}{3}$%

Q.39. How much annual instalment will discharge a debt of ₹9,600 in 5 years at 10% simple interest per annum?
Group D 13/09/2022 (Morning)
(a) ₹1,550 (b) ₹1,600
(c) ₹1,500 (d) ₹1,450

Q.40. Mohan borrows a sum of ₹2,20,000 at the rate of 8% per annum simple interest. At the end of the first year, he repays ₹27,600 towards return of principal amount borrowed. If Mohan clears all pending dues at the end of the second year. including interest payment that accrued during the first year, how much does he pay at the end of the second year?
Group D 13/09/2022 (Evening)
(a) ₹2,25,512 (b) ₹2,26,800
(c) ₹2,25,392 (d) ₹2,27,600

Q.41. If interest is ₹3,000, the rate of interest is 6% per annum simple interest, and time period is 4 years, then the principal sum is_____.
Group D 15/09/2022 (Afternoon)
(a) ₹13,500 (b) ₹12,500
(c) ₹18,000 (d) ₹17,500

Q.42. At what rate of simple interest per annum will a sum of money get doubled in 10 years?
Group D 15/09/2022 (Evening)
(a) 8.5% (b) 15% (c) 20% (d) 10%

Q.43. A sum of money was invested at a certain rate of simple interest per annum for a period of 4 years. Had the rate of simple interest per annum been 2% more, the sum invested would have earned a total of ₹640 more as interest in these 4 years. What was the sum (in₹) invested?
Group D 16/09/2022 (Evening)
(a) 7,500 (b) 9,000 (c) 8,000 (d) 9,500

Q.44. Ramesh invested a certain sum of money at 9% per annum simple interest. If he receives an interest of ₹20,250 after one year, the sum he invested is:
Group D 18/09/2022 (Afternoon)
(a) ₹2,25,000 (b) ₹2,00,000
(c) ₹2,75,000 (d) ₹2,50,000

Q.45. If the principal amount is ₹13,000, then the simple interest for 4 years at a rate of 5% per annum is _____.
Group D 19/09/2022 (Afternoon)
(a) ₹5,200 (b) ₹1,300
(c) ₹2,600 (d) ₹2750

Q.46. Johnny borrows ₹7,000 from a bank at simple interest. After 3 years he pays ₹4,000 to the bank, this amount being entirely adjusted as repayment of part of the principal borrowed. At the end of 5 years from the date of borrowing he pays ₹4,350 to the bank to settle the account. Find the rate of interest.
Group D 19/09/2022 (Evening)
(a) 7% (b) 4% (c) 6% (d) 5%

Q.47. If a sum of ₹2,000 amounts to ₹2,360 in 3 years at a certain rate of simple interest per annum, then what will the same sum amount to in 5 years, if the rate of simple interest per annum remains the same?
Group D 27/09/2022 (Morning)
(a) ₹2,500 (b) ₹2,600
(c) ₹2,605 (d) ₹2,650

Q.48. Azim borrowed a certain sum which amounted to ₹19,800 in 36 months at 12.5% per annum simple interest. What is the borrowed sum ?
Group D 28/09/2022 (Morning)
(a) ₹14,400 (b) ₹13,600
(c) ₹9,600 (d) ₹1,2800

Q.49. A certain sum under simple interest at a certain rate of interest per annum amounts to ₹1,200 in 2 years and to ₹1,500 in 3 years. The rate of interest per annum is:
Group D 28/09/2022 (Afternoon)
(a) 10% (b) 25% (c) 50% (d) 15%

Q.50. The simple interest for 6 years, at a certain rate of interest per annum, is one-sixth of the principal. At the same rate of simple interest, what sum of money will amount to ₹6,000 total in 3 years? [Give your answer correct to 2 decimal places.]
Group D 07/10/2022 (Morning)
(a) ₹6,539.65 (b) ₹6,565.39
(c) ₹5,538.46 (d) ₹5,565.39

Q.51. A sum of ₹7,250 is lent under simple interest at the beginning of a year at a certain rate of interest per annum. After 6 months, a sum of ₹3,625 more is lent under simple interest but at a rate that is twice the former. At the end of the year, ₹335 is earned as interest from both the loans taken together. What was the rate of interest per annum at which the initial ₹7,250 was lent? [Give your answer correct to 2 decimal places.]
Group D 11/10/2022 (Morning)
(a) 3.08% (b) 3.00%
(c) 3.10% (d) 3.12%

Q.52. A trader owes a merchant ₹9,000 due in one year. However, the trader wants to settle the amount after 4 months. If the rate of interest is 6% per annum, then, how much money should he pay? (Give your answer correct to the nearest whole number value.)
Group D 11/10/2022 (Afternoon)
(a) ₹8,686 (b) ₹8,654
(c) ₹8,645 (d) ₹8,688

Q.53. A sum of ₹5,000 is divided into two parts. One part is deposited in bank A at simple interest at 5% per annum, and the other part is deposited in bank B at simple interest at 10% per annum. If the total annual interest received is ₹325, then the money deposited in bank A was:
Group D 11/10/2022 (Afternoon)
(a) ₹5,000 (b) ₹3,500
(c) ₹4,000 (d) ₹1,500

Q.54. A sum was invested at a certain rate of simple interest per annum for 8 years. Had it been invested at a rate of simple interest per annum that is 8% higher than the rate at which the sum had been actually invested, it would have fetched ₹4,000 more as interest at the end of the 8-year period. What was the sum invested?
Group D 11/10/2022 (Evening)
(a) ₹6,250 (b) ₹6,750
(c) ₹6,925 (d) ₹6,500

RRB NTPC CBT - 2
(09/05/2022 to 17/06/2022)

Q.55. Out of a total sum of ₹5,000, Danish invested one part at 12% simple interest per annum and the remaining part at 10% simple interest per annum. If the total interest that accrued to Danish in two years equals ₹1072, what was the sum Danish invested at 12 % simple interest per annum ?
Level 6 (09/05/2022) Shift 1
(a) ₹2,150 (b) ₹1,750
(c) ₹1,800 (d) ₹2,000

Q.56. The amount payable on maturity after $5\frac{1}{2}$ years on a sum of ₹4,750, when invested at a certain rate percent of simple interest per annum, was ₹6,840. What was the per annum percent rate of simple interest paid ?
Level 6 (09/05/2022) Shift 2
(a) 9% (b) 8.5% (c) 8% (d) 7.5%

Q.57. The simple interest on a certain sum for $3\frac{1}{3}$ years at 15% p.a. is ₹1,840 less than the simple interest on the same

sum for $5\frac{1}{2}$ years at 12% p.a. The sum is:
Level 6 (09/05/2022) Shift 2
(a) 12,500 (b) 11,500
(c) 13,500 (d) 10,105

Q.58. A certain sum amounts to Rs 22,494 in 7 years at x% per annum on simple interest. if the rate of simple interest per annum had been (x + 4) % , the amount payable after 7 years would have been Rs 25,917. Find the sum invested.
Level 5 (12/06/2022) Shift 1
(a) 11,975 (b) 12,275
(c) 12,175 (d) 12,225

Q.59. The amount payable on maturity of a certain sum which is invested for 5 year at a certain rate per cent p.a. is Rs 9,800 and the amount payable on the same sum invested for 10 years at the same rate is Rs 12,600. If simple interest is offered in both cases. The rate of interest p.a. is ?
Level 5 (12/06/2022) Shift 1
(a) 10% (b) 7.8% (c) 8.5% (d) 8%

Q.60. The amount payable on maturity of a certain sum invested at a certain rate of interest per annum for one year was ₹1,484. If the rate of interest had been 2% higher, the amount would have been ₹26.50 more. What was the interest that was paid on the sum invested at the original rate ?
Level 5 (12/06/2022) Shift 2
(a) ₹152.50 (b) ₹ 161 (c) ₹ 157 (d) ₹ 159

Q.61. A sum of money was invested at simple interest at r% per annum for 3 years. Had the rate of interest been (r + 2)%, it would have fetched ₹84 more. Find the sum invested.
Level 2 (13/06/2022) Shift 2
(a) ₹1600 (b) ₹1500 (c) ₹1200 (d) ₹1400

Q.62. Determine the number of months required to get Rs 25.5 as simple interest on Rs 850 at 3.6% per annum.
Level 3 (14/06/2022) Shift 1
(a) 10 months (b) 9 months
(c) 8 months (d) 11 months

Q.63. On simple interest a certain sum becomes 160% of itself in 5 years at a certain rate of interest per annum. In how many years will the sum double itself under the same rate of interest ?
Level 5 (15/06/2022) Shift 2
(a) 7 year (b) 10 year
(c) $8\frac{1}{3}$ *year* (d) $9\frac{1}{2}$year

Q.64. At certain rate of simple interest per annum a sum of money amounts to $\frac{13}{8}$ of itself in 10 years. What is the rate of simple interest per annum ?
Level 5 (15/06/2022) Shift 3
(a) 6.25 % (b) 7.5% (c) 5% (d) 7.25%

Q.65. A sum of ₹9200 was lent partly at 5% p.a. and the rest at 8% p.a., both earning simple interest. Total interest received after 3 years was ₹1812. The sum (in ₹) lent at 5% p.a. Was .
Level 2 (16/06/2022) Shift 1
(a) ₹5200 (B) ₹4,600 (c) ₹4400 (d) ₹4200

Q.66. Find the simple interest on Rs 48750 at 16% per annum for 73 days of a non-leap year.
Level 2 (16/06/2022) Shift 2
(a) 1560 (b) 1600 (c) 1860 (d) 1500

Q.67. A sum of money, when invested at 14.5% p.a. simple interest amounts to ₹ 13,464 after 6 years. What was the sum invested ?
Level 3 (17/06/2022) Shift 1
(a) ₹ 7,600 (b) ₹ 70,800
(c) ₹ 7,200 (d) ₹ 7,450

Q.68. A sum of ₹ 14,500 was invested at 9 % per annum simple interest for few years. The interest accrued during this period was ₹ 7,830. What was the period of investment ?
Level 3 (17/06/2022) Shift 2
(a) 5 year (b) 7 year (c) 6 year (d) 4 year

RRB NTPC CBT - 1
(28/12/2020 to 31/07/2021)

Q.69. A sum of money of Rs. 2600.00 was lent out in two parts in such a way that the simple interest on the first part at 10% per annum for 5 years is the same as the interest of the second part at 9% per annum for 6 years. The part lent out at 10% is
RRB NTPC 28/12/2020 (Evening)
(a) Rs. 1150.00 (b) Rs. 1250.00
(c) Rs. 1350.00 (d) Rs. 1450.00

Q.70. A sum of Rs.5,000 was lent partly at 5% simple interest per annum and partly at 10% simple interest per annum. Total interest received after 5 years was Rs.1,750. Find the amount of money that was lent out at 10% simple interest per annum.
RRB NTPC 29/12/2020 (Morning)
(a) Rs.3,000 (b) Rs.3,500
(c) Rs.2,000 (d) Rs.2,500

Q.71. A sum of Rs. 5,000 is invested at 10% simple interest per annum. In how many years will the amount of interest become Rs.1,500?
RRB NTPC 29/12/2020 (Evening)
(a) 3 (b) 5 (c) 6 (d) 8

Q.72. Anil Kumar took a loan of 24,000 with simple interest for as many years as the rate of interest. If he paid 19,440 as interest at the end of the loan period, what was the rate of interest?
RRB NTPC 30/12/2020 (Evening)
(a) 8% (b) 9% (c) 8.5% (d) 10%

Q.73. Anil lent Rs. 7,200 to Dubey for 3 years and Rs.8,400 to Raghav for 4 years on simple interest at the same rate of interest and received Rs 4,968 in total from them as interest. Find the rate of interest p.a.
RRB NTPC 04/01/2021 (Evening)
(a) 8% (b) 12% (c) 9% (d) 10%

Q.74. Which of the following is correct, when a formula has its symbolic meaning
(A - Amount, P- Principal, SI - simple interest)?
RRB NTPC 05/01/2021 (Evening)
(a) A = P + SI (b) P = A + SI
(c) A + P = SI (d) P - A = 2SI

Q.75. Bhawna borrowed Rs 4,500 from a lender at the rate of 15% per annum, simple interest on 26 March 2018 and cleared the loan on 7 June of the same year. What amount did she pay to clear her loan?
RRB NTPC 07/01/2021 (Evening)
(a) Rs. 53,775 (b) Rs. 4,635
(c) Rs. 135 (d) Rs. 49,275

Q.76. Rahim invested a certain sum at 5% simple interest for 3 years. His friend Hiralal invested the same sum for 2 years at 7% simple interest. Rahim got Rs.30 more interest than Hiralal. What was the amount invested by them?
RRB NTPC 08/01/2021 (Morning)
(a) Rs. 3,000.00 (b) Rs. 2,000.00
(c) Rs. 5,000.00 (d) Rs. 7,000.00

Q.77. Dalip Rai borrowed Rs 24,000 from Amarjeet at a simple interest of 9% per annum. Find the sum he will have to return after 3 years.
RRB NTPC 09/01/2021 (Morning)
(a) Rs. 4,800 (b) Rs. 28,800
(c) Rs. 30,480 (d) Rs. 6,480

Q.78. Lalit gave a loan of Rs 12000 to his friend Tarun at simple interest for 2 years and got Rs 1200 as interest. Find the rate of interest per annum.
RRB NTPC 10/01/2021 (Morning)

(a) 10% per annum
(b) 5% per annum
(c) 500 % per annum
(d) $5\frac{5}{9}$% per annum

Q.79. How long will it take a sum of money invested at 6% p.a. On simple interest to increase its value by 50%?
RRB NTPC 11/01/2021 (Morning)
(a) $3\frac{1}{8}$years (b) $8\frac{1}{3}$years
(c) 8 years (d) 3 years

Q.80. A sum of Rs800 becomes Rs 920 in 3 years at simple interest. If interest is increased by 4%, then the amount will increase to:
RRB NTPC 12/01/2021 (Evening)
(a) Rs 1,050 (b) Rs 999
(c) Rs 216 (d) Rs 1,016

Q.81. Ravi took a loan from a bank at the rate of 8% p.a. simple interest. After 5 years, he had to pay an interest of Rs 6,400 for the period. Find the principal amount borrowed by Ravi.
RRB NTPC 13/01/2021 (Evening)
(a) Rs.16,000 (b) Rs.15,000
(c) Rs. 18,000 (d) Rs. 10,000

Q.82. At what rate percent per annum will the simple interest in 15 years on a sum of money be $\frac{3}{4}$of the sum invested?
RRB NTPC 16/01/2021 (Morning)
(a) 3% `(b) 5% (c) 4% (d) 6%

Q.83. Vikas took a loan of Rs. 1,200 on simple interest for as many years as the rate of interest. If he paid Rs. 768 as interest as the end of the loan period, then what was the rate of interest?
RRB NTPC 21/01/2021 (Morning)
(a) 8.5% (b) 7.8% (c) 7.5% (d) 8.0%

Q.84. A sum of money amounts to Rs. 12,000 after 6 years and Rs. 15,000 after 9 years at the same rate of simple interest. What is the rate of interest per annum?
RRB NTPC 21/01/2021 (Morning)
(a) $16\frac{1}{3}$% (b) 16%
(c) $16\frac{2}{3}$% (d) $18\frac{2}{3}$%

Q.85. If the simple interest on a certain sum of money for 3 years at 8% per annum is half the compound interest on Rs.4,000 for 2 years at 10% p.a., then the sum placed on simple interest is:
RRB NTPC 21/01/2021 (Evening)
(a) Rs.1,550 (b) Rs.1,650
(c) Rs.2,000 (d) Rs.1,750

Q.86. At what rate per cent of simple interest does a sum of money double itself in 12 years?
RRB NTPC 23/01/2021 (Morning)
(a) $8\frac{2}{3}$ % (b) $9\frac{2}{3}$ % (c) $8\frac{1}{3}$ % (d) $9\frac{1}{3}$ %

Q.87. A man purchases a washing machine for Rs. 12,000. He pays Rs. 2000 while purchasing and the rest after 1 year, on which he is charged a simple interest at the rate of 10% per year. The total amount he pays for the washing machine is:
RRB NTPC 23/01/2021 (Evening)
(a) Rs. 13000 (b) Rs. 15000
(c) Rs. 12000 (d) Rs. 16000

Q.88. The simple interest on a given sum of money for two years would have been Rs. 240 more if the rate of interest per annum had been 3% higher. Find the sum invested.
RRB NTPC 25/01/2021 (Morning)
(a) Rs. 3,600 (b) Rs. 8,000
(c) Rs. 4,000 (d) Rs. 3,000

Q.89. A sum of money at simple Interest doubles itself in 4 years 4 months. In how much time will it triple itself?
RRB NTPC 27/01/2021 (Morning)
(a) $8\frac{1}{3}$ years (b) 8 years
(c) $3\frac{1}{8}$ years (d) $8\frac{2}{3}$ years

Q.90. Some amount out of Rs. 7,000 was lent at 6% p.a. and the remaining at 4% p.a. If the total simple interest received on the amount of Rs. 7,000 in 5 years was Rs. 1,600, then find the amount that was lent at 6% p.a.
RRB NTPC 27/01/2021 (Evening)
(a) Rs. 3,000 (b) Rs. 5,000
(c) Rs. 4,000 (d) Rs. 2,000

Q.91. The simple interest on a certain sum for 3 years at 8% per annum is Rs 96 more than the simple interest on the same sum for 2 years at 9% per annum. Find the sum?
RRB NTPC 28/01/2021(Morning)
(a) Rs 1,800 (b) Rs 1,600
(c) Rs 1,500 (d) Rs 1,700

Q.92. A sum of Rs. 800 is invested for 3 years at simple interest rate. The rates of interest for the 3 years are 6%, 8% and 10% per annum. Find the total amount of interest earned at the end of 3 years.
RRB NTPC 28/01/2021 (Evening)
(a) Rs. 185 (b) Rs. 195
(c) Rs. 188 (d) Rs. 192

Q.93. A sum of money amounts to 3 times the original sum in 15 years. In how many years will the original sum amount to 5 times of itself at the same rate of simple interest.
RRB NTPC 29/01/2021 (Morning)
(a) 25 (b) 35 (c) 20 (d) 30

Q.94. A sum of Rs 10,000 is borrowed on simple interest at a rate of 15% per annum. Find the interest to be paid at the end of two years.
RRB NTPC 29/01/2021 (Morning)
(a) Rs. 3,500 (b) Rs. 2,500
(c) Rs. 3,000 (d) Rs. 2,000

Q.95. If Rs 5,000 becomes Rs 5,900 in one year, what will Rs 8,000 become at the end of 5 years at the same rate of simple interest.
RRB NTPC 29/01/2021 (Morning)
(a) Rs. 15,000 (b) Rs. 16,200
(c) Rs. 16,000 (d) Rs. 15,200

Q.96. If simple interest is offered per annum on a sum of money invested for five years, the amount of money payable on maturity after the five years is Rs 2,340. However, if the sum was invested for only two years, the amount payable on maturity would be Rs 2016. What was the original sum invested?
RRB NTPC 31/01/2021 (Morning)
(a) Rs 1600/- (b) Rs 2000/-
(c) Rs 1750/- (d) Rs 1800/-

Q.97. If the simple interest for 7 years is equal to 56% of the principal, it will be equal to the principal after:
RRB NTPC 01/02/2021 (Morning)
(a) 7 years 6 months
(b) 10 years 9 months
(c) 12 years 6 months
(d) 9 years 8 months

Q.98. An amount becomes eight-fifth of the original amount in 5 years at what percentage rate of simple interest per annum ?
RRB NTPC 01/02/2021 (Evening)
(a) 11 (b) 15 (c) 12 (d) 13

Q.99. The rate at which a sum becomes 2 times of itself in 10 years at simple interest is:
RRB NTPC 02/02/2021 (Morning)
(a) 10% (b) 25% (c) 20% (d) 15%

Q.100. A sum of money, invested for 8 years on 5% per annum simple interest, amounted to Rs. 175 on maturity. What was the sum invested?
RRB NTPC 02/02/2021 (Evening)
(a) Rs. 120 (b) Rs. 125
(c) Rs. 140 (d) Rs. 175

Q.101. The difference between the simple interest recovered from two different sources on Rs 1200 for 3 years is Rs 10.80. The difference between the rates of interest is:
RRB NTPC 03/02/2021 (Morning)
(a) 0.03% (b) 0.6% (c) 0.3% (d) 1%

Q.102. A person invested $\frac{2}{3}$ of the capital at the rate of 6% , $\frac{1}{5}$ at the rate of 10%, and the remainder at the rate of 15%. If his annual income is Rs 6,00. The capital will be :
RRB NTPC 03/02/2021 (Morning)
(a) Rs 4,500 (b) Rs 5,000
(c) Rs 2,500 (d) Rs 7,500

Q.103. A woman borrowed some money on simple interest. After 4 years she returned $\frac{6}{5}$ of money to the lender. What was the rate of interest?
RRB NTPC 09/02/2021 (Evening)
(a) 3% p.a. (b) 5% p.a.
(c) 4% p.a. (d) 2% p.a.

Q.104. A sum of money lent at simple interest amounts to Rs. 720 after 2 years and to Rs. 1020 after a further period of 5 years. What is the sum of money?
RRB NTPC 11/02/2021 (Morning)
(a) Rs. 600 (b) Rs. 500
(c) Rs. 200 (d) Rs. 400

Q.105. A sum of money doubles itself in 10 years. In how many years will it be triple at the same rate of simple interest?
RRB NTPC 12/02/2021 (Morning)
(a) 20 (b) 15 (c) 23 (d) 10

Q.106. What will be the simple interest on a sum of Rs. 2,000 for 4 years at a rate of 1 paisa per rupee per month?
RRB NTPC 15/02/2021 (Morning)
(a) Rs. 960 (b) Rs. 609
(c) Rs. 690 (d) Rs. 900

Q.107. A sum of money increases to Rs 7, 500 after 5 years and Rs 9, 200 after 7 years respectively at the same rate of simple interest. Find the approximate rate of interest per annum.
RRB NTPC 15/02/2021 (Evening)
(a) 28.3% (b) 27.4% (c) 25.3% (d) 26.2%

Q.108. A sum of money invested at x% simple interest per annum amounts to Rs. 2,368 in 6 years and to Rs. 3,008 in 11 years. Find the value of x.
RRB NTPC 17/02/2021 (Evening)
(a) 5 (b) 6 c) 8 (d) 7.5

Q.109. A sum of money lent out at simple interest amounts to Rs.600 after two years and to Rs.900 after a further period of 5 years. The interest rate is:
RRB NTPC 22/02/2021 (Evening)
(a) 12% (b) 13% (c) 12.5% (d) 10%

Q.110. The capital required to earn a monthly interest of Rs 1,500 at 12% per annum simple interest is:
RRB NTPC 27/02/2021 (Morning)
(a) Rs 1 lakh (b) Rs 1.5 lakhs
(c) Rs 25 lakhs (d) Rs 15 lakhs

Q.111. A certain sum of money at simple interest amounts to Rs. 1,512 in 3 years and to Rs. 1,668 in 4.5 years. The rate of interest on this sum of money is:
RRB NTPC 01/03/2021 (Morning)
(a) $\frac{26}{3}$% (b) $\frac{24}{3}$% (c) $\frac{28}{3}$% (d) 10%

Q.112. If an amount gets tripled in $12\frac{1}{2}$ years, the rate of simple interest is...
RRB NTPC 02/03/2021 (Morning)
(a) 12% (b) 16% (c) 10% (d) 8%

Q.113. How long will it take a sum of money invested at 10% per annum at simple interest to increase its value by 40%?
RRB NTPC 02/03/2021 (Morning)
(a) 6 years (b) 9 years
(c) 4 years (d) 8 years

Q.114. If the simple interest for 8 years is equal to 40% of the principal amount, it will be equal to the principal amount at the same interest rate after:
RRB NTPC 02/03/2021 (Evening)
(a) 16 years (b) 15 years
(c) 18 years (d) 20 years

Q.115. A sum of Rs. 480 amounts to Rs.600 in 5 years at simple interest. If the interest rate was 2% higher, by how much would the interest amount increase?
RRB NTPC 04/03/2021 (Morning)
(a) Rs.64 (b) Rs.50 (c) Rs.48 (d) Rs.85

Q.116. A invests two equal amounts in two banks giving rates of simple interest as 10% per annum and 12% per annum respectively. At the end of the year, the interest earned is Rs. 1650. The amount invested in each bank is:
RRB NTPC 05/03/2021 (Morning)
(a) 1650 (b) 750 (c) 7500 (d) 15000

Q.117. The ratio of simple interest earned on a certain amount at the rate of 5% and 8% for 6 years and 3 years respectively is:
RRB NTPC 07/03/2021 (Evening)
(a) 5:4 (b) 4:5 (c) 2:3 (d) 3:2

Q.118. A sum becomes its double in 8 years. The annual rate of simple interest is:
RRB NTPC 08/03/2021 (Evening)
(a) 10% (b) 8% (c) $9\frac{1}{2}$% (d) $12\frac{1}{2}$%

Q.119. Manvi borrowed some money on simple interest, at the rate of 6% p.a. for the first three years, at the rate of 9% p.a. for the next five years and at the rate of 13% p.a. for the period beyond eight years. If the total interest paid by him at the end of eleven years is Rs. 8,160, how much money did he borrow?
RRB NTPC 11/03/2021 (Morning)
(a) Rs. 11,000 (b) Rs. 8,000
(c) Rs. 12,000 (d) Rs. 10,000

Q.120. The simple interest on a certain sum of money at the rate of 6% p.a. for 7 years is Rs. 840. At what rate of interest can the same amount of interest be received on the same sum of money after 5 years?
RRB NTPC 11/03/2021 (Evening)
(a) 6.6% (b) 10.8% (c) 8.4% (d) 9.6%

Q.121. If a certain sum at interest rate 6 $\frac{1}{4}$% per annum, compounded yearly, for 3 years, amounts to Rs. 4913 then find the simple interest on the same sum at the same rate of interest for the same period.
RRB NTPC 12/03/2021 (Morning)
(a) Rs. 764 (b) Rs. 756
(c) Rs. 768 (d) Rs. 766

Q.122. Calculate the approximate simple interest on Rs. 73,000 at $13\frac{1}{3}$% per annum for 10 months.
RRB NTPC 12/03/2021 (Evening)
(a) Rs. 7,500 (b) Rs. 8,111
(c) Rs. 6,112 (d) Rs. 9,000

Q.123. The ratio of simple interest earned by a certain amount at the rate of 5% for 6 years and 8% for 3 years is:
RRB NTPC 13/03/2021 (Evening)
(a) 5:4 (b) 3:2 (c) 2:3 (d) 4:5

Q.124. The simple interest on Rs. 10,000 for 6 months at the rate of 5 paise per rupee per month is:
RRB NTPC 13/03/2021 (Evening)
(a) Rs. 3,000 (b) Rs. 1,000
(c) Rs. 2,000 (d) Rs. 1,500

Q.125. If the annual rate of simple interest increases from 8% to $12\frac{1}{2}$%, a person's yearly income from interest increases by Rs. 369 then what is the

principal amount of his investment?
RRB NTPC 14/03/2021 (Morning)
(a) Rs. 8,100 (b) Rs. 8,500
(c) Rs. 8,200 (d) Rs. 8,150

Q.126. If at simple interest, an amount doubles in 5 years, how many times of the original amount, will it be after 8 years at the same rate of simple interest?
RRB NTPC 14/03/2021 (Morning)
(a) $3\frac{2}{5}\ times$ (b) $2\frac{1}{5}\ times$
(c) $3\frac{3}{5}\ times$ (d) $2\frac{3}{5}\ times$

Q.127. A sum of Rs. 2700 is lent out in two parts in such a way that, the simple interest on one part at 15% for 4 years is equal to the simple interest on the second part at 10% for 6 years. The part of the sum lent out at 15% is..
RRB NTPC 14/03/2021 (Evening)
(a) Rs. 1150 (b) Rs. 1250
(c) Rs. 1350 (d) Rs. 1450

Q.128. Find the simple interest on Rs. 3000 at $6\frac{1}{4}$% p.a. for the period from 5 Feb 2005 to 18 April 2005, both dates included.
RRB NTPC 14/03/2021 (Evening)
(a) Rs. 40 (b) Rs. 37.50
(c) Rs. 35.50 (d) Rs. 42.80

Q.129. A sum of money doubles at simple interest in 5 years. In how many years, will it become four times itself?
RRB NTPC 19/03/2021 (Evening)
(a) 11 (b) 12 (c) 15 (d) 14

Q.130. A sum was invested at a simple interest at a certain rate for 2 years. Had it been invested at a 3% higher rate. it would have fetched Rs.300 more. Find the sum invested.
RRB NTPC 21/03/2021 (Morning)
(a) Rs.4500 (b) Rs.5200
(c) Rs.6000 (d) Rs.5000

Q.131. A certain sum of money, invested on simple interest, amounts to Rs. 756 in 2 years and to Rs.873 in 3.5 years.Find the sum (in Rs.)
RRB NTPC 21/03/2021 (Evening)
(a) 500 (b) 700 (c) 600 (d) 400

Q.132. A person lent a certain sum of money at the rate of 4% simple interest per annum. In 8 years, the interest amounted to Rs. 340 less than the sum lent. Find the sum lent.
RRB NTPC 27/03/2021 (Morning)
(a) Rs. 600 (b) Rs. 800
(c) Rs. 500 (d) Rs. 400

Q.133. A man lent a part of Rs. 30,000 at the rate of 10% per annum and the remaining at the rate of 8% per annum simple interest. The total interest he received after 3 years is Rs. 8,280. Find the amount he lent at 10% per annum.
RRB NTPC 27/03/2021 (Morning)
(a) Rs. 16,000 (b) Rs. 20,000
(c) Rs. 19000 (d) Rs. 18000

Q.134. The interest on a sum of money at 10% p.a. for 2 years with interest being compounded annually is Rs. 630. Find the simple interest (in Rs.) on the sum at the same rate of interest for 3 years.
RRB NTPC 03/04/2021 (Morning)
(a) 850 (b) 900 (c) 650 (d) 950

Q.135. A sum of money amounts to Rs.850 in 3 years and Rs.925 in 4 years on simple interest. What is the sum?
RRB NTPC 03/04/2021 (Evening)
(a) Rs.625 (b) Rs. 700
(c) Rs. 850 (d) Rs.925

Q.136. The simple interest on a sum of money borrowed is Rs. 10 at the rate of 10% p.a. for 10 years. How much is the sum of money borrowed?
RRB NTPC 05/04/2021 (Morning)
(a) Rs. 100 (b) Rs. 10
(c) Rs. 10,000 (d) Rs. 1,000

Q.137. Kumar lent an amount to Arif at a simple interest rate of 10% p.a. for 3 years, and Arif lent this amount to Naresh at a simple interest rate of 20% p.a. for 3 years. If Arif gained Rs.1,560 in this process, then what was the amount that Kumar had lent to Arif?
RRB NTPC 07/04/2021 (Evening)
(a) Rs.6,200 (b) Rs.5,600
(c) Rs.5,400 (d) Rs.5,200

RRB JE
(22/05/2019 to 28/06/2019)

Q.138. The Simple Interest on some amount of money for 2 years is Rs.400. If rate of interest, is 4% more, then the Simple Interest will be Rs.400 more. What is the original amount of money?
RRB JE 22/05/2019 (Afternoon)
(a) Rs.5000 (b) Rs.4000
(c) Rs.10000 (d) Rs.12000

Q.139. If Rs.64 amounts to Rs.83.20 in 2 years, what will Rs.86 amount to in 4 years at the same rate of Simple Interest ? RRB JE 22/05/2019 (Evening)
(a) Rs.124.70 (b) Rs.137.60
(c) Rs.114.8 (d) Rs.127.40

Q.140. A person borrows Rs.5000 for 2 years at 4% per annum Simple Interest. He immediately lends it to another person at 6.25% per annum for 2 years. Find his annual gain in the transaction ?
RRB JE 22/05/2019 (Evening)
(a) Rs.167.50 (b) Rs.112.50
(c) Rs.125 (d) Rs.150

Q.141. If a sum of money doubles itself in 4 years at a certain rate, when will it become 16 time itself at the same rate of Simple Interest?
RRB JE 23/05/2019 (Evening)
(a) 25 years (b) 16 years
(c) 12 years (d) 60 years

Q.142. If Simple Interest is 12.5% more than the principal and number of years(n), rate(r) are numerically in the ratio 2: 1, then find the values of n, r.
RRB JE 24/05/2019 (Morning)
(a) n=12, r=6% (b) n=15; r=$7\frac{1}{2}$%
(c) n=20, r=10% (d)n = 14; r = 7%

Q.143. If a sum becomes 4 times in 20 years ,what is the rate of simple interest ?
RRB JE 24/05/2019 (Evening)
(a) $13\frac{1}{3}$% (b) 20% (c) 15% (d) 10%

Q.144. At what rate per cent will a sum of money double itself in 30 years?
RRB JE 26/05/2019 (Evening)
(a) $3\frac{1}{4}$% (b) 3 % (c) $3\frac{1}{3}$% (d) $3\frac{1}{2}$%

Q.145. Rs.800 becomes Rs.956 in 3 years at a certain rate of Simple Interest. If the rate of interest is increased by 4%, what will Rs.800 become in 3 years?
RRB JE 27/05/2019 (Afternoon)
(a) Rs.1052 (b) Rs.1025
(c) Rs.1020.80 (d) Rs.1054

Q.146. Rs.16500 is split into two fixed deposits for 2 years at 10% and 12% Simple Interest. If the total interest received from the deposits is Rs.3620, how much was invested in the 12% scheme ?
RRB JE 28/05/2019 (Morning)
(a) Rs.10500 (b) Rs.10000
(c) Rs.8500 (d) Rs.8000

Q.147. P1, P2, P3 are invested at 4%, 6%, 8% respectively such that the Simple Interests from all the three at the end of the year are equal. If the sum of three investments is Rs.2600, then find the values of P1, P2 and P3 respectively.
RRB JE 28/05/2019 (Afternoon)
(a) Rs.1200, Rs.600, Rs.800
(b) Rs.1200, Rs.800, Rs.600

(c) Rs1000, Rs.900, Rs.700
(d) Rs.1100, Rs.800, Rs.700

Q.148. If a loan grew 3 times in 6 years at Simple Interest, then how much time will it take to grow 8 times?
RRB JE 29/05/2019 (Afternoon)
(a) 15 years (b) 22 years
(c) 20 years (d) 21 years

Q.149. If the Simple Interest on a certain sum for 15 months at 7.5% per annum exceeds the Simple Interest on the same sum for 8 months at 12.5% per annum by Rs.32.50, then find the sum.
RRB JE 29/05/2019 (Afternoon)
(a) Rs.3000 (b) Rs.3060
(c) Rs.3120 (d) Rs.2900

Q.150. If a certain sum becomes Rs.20720 in 4 years and Rs.24080 in 6 years, find the sum and rate of Simple Interest.
RRB JE 30/05/2019 (Afternoon)
(a) Rs.16000, 8% (b) Rs.14000, 10%
(c) Rs.14000, 12% (d) Rs.16000, 12%

Q.151. Rs.800 becomes Rs.956 in 3 years at a certain rate of Simple Interest. What is the rate?
RRB JE 31/05/2019 (Evening)
(a) 8.2% (b) 8% (c) 7.5% (d) 6.5%

Q.152. The repayment amount of a loan after 6 years at a rate of 24% Simple Interest is Rs.73200. What is the amount borrowed?
RRB JE 01/06/2019 (Morning)
(a) Rs.42000 (b) Rs.30000
(c) Rs.45000 (d) Rs.30800

Q.153. The difference between the Simple Interest on some principal at 8% for 8 months and 6% for 14 months is Rs.200. What is the principle ?
RRB JE 01/06/2019 (Morning)
(a) Rs. 14400 (b) Rs. 24000
(c) Rs.12000 (d) Rs. 12800

Q.154. A sum of money was put at Simple Interest at a certain rate for 10 years. Had it been put at a 5% higher rate, the interest would be Rs. 1200 more. What was the sum?
RRB JE 26/06/2019 (Morning)
(a) Rs.2500 (b) Rs.2000
(c) Rs.3000 (d) Rs.2400

Q.155. Find the Simple Interest on Rs.5000 at 6.25% per annum from 5th February 2017 to 19th April 2017.
RRB JE 26/06/2019 (Evening)
(a) Rs. 62.50 (b) Rs. 48.50
(c) Rs. 64 (d) Rs. 80

Q.156. If a sum becomes 4 times in 7 years, in what time will it become 16 times at the same rate of Simple Interest?
RRB JE 27/06/2019 (Evening)
(a) 25 years (b) 28 years
(c) 20 years (d) 35 years

Q.157. A sum of Rs.800 becomes Rs.956 in 3 years at some rate of Simple Interest. If the rate is increased by 4%, then what will be the gain in the investment?
RRB JE 28/06/2019 (Evening)
(a) Rs. 1052 (b) Rs. 96
(c) Rs. 72 (d) Rs.108

RRB ALP Tier - 2
(21/01/2019 to 08/02/2019)

Q.158. The total simple interest received on a certain sum at the rate of 12% per annum in 5 years is Rs 4,800. What is the principal amount?
ALP Tier II 08/02/2019 (Morning)
(a) ₹ 15,000 (b) ₹ 20,000
(c) ₹ 8,000 (d) ₹ 18,000

RPF Constable
(17/01/2019 to 19/02/2019)

Q.159. Interest earned after investing in a simple interest for 5 years at a rate of 12% per annum is Rs. 3720. find the amount invested (in rupees) ?
RPF Constable 17/01/2019 (Morning)
(a) 6300 (b) 6500 (c) 6400 (d) 6200

Q.160. Calculate the amount of money received (in rupees) after investing Rs. 7400 on a simple interest at the rate of 12% per annum for 4 years .
RPF Constable 17/01/2019 (Morning)
(a) 10952 (b) 10852 (c) 10752 (d) 10652

Q.161. An amount invested at 12% per annum in 5 years yields an interest of Rs 4,500. What was the amount invested? (in Rs.)
RPF Constable 17/01/2019 (Evening)
(a) 7,400 (b) 7,600 (c) 7,500 (d) 7,300

Q.162. What will the Rs 8,700 amount to if it was invested at the annual interest rate of 12% for 4 years? (In rupees)
RPF Constable 17/01/2019 (Evening)
(a) 12,876 (b) 13,876
(c) 15,876 (d) 14,876

Q.163. Vinith invested Rs.4,860 and received an amount of Rs.5,832 after two years . Find the rate of interest, if he has invested in simple interest.
RPF Constable 18/01/2019 (Morning)
(a) 15% (b) 12.5% (c) 10% (d) 8%

Q.164. Interest earned on a certain sum at 12% simple interest for 5 Years is Rs 4080. find the amount invested in rupees.
RPF Constable 18/01/2019 (Afternoon)
(a) 6900 (b) 6800 (c) 6400 (d) 6600

Q.165. Find the final amount when a sum of Rs 8000 was invested at 12% per year for 4 years.
RPF Constable 18/01/2019 (Afternoon)
(a) 12840 (b) 11840 (c) 14840 (d) 13840

Q.166. After investing an amount at 12% per annum on the simple interest for 5 years, Rs. 3900 is received as interest. Find the amount invested. (In rupees)
RPF Constable 18/01/2019 (Evening)
(a) 6400 (b) 6200 (c) 6500 (d) 6300

Q.167. Rs.7700 is invested at simple interest then find the amount received after 4 years at the rate of 12% per annum. (in Rs.)
RPF Constable 18/01/2019 (Evening)
(a) 11396 (b) 12396
(c) 13396 (d) 14396

Q.168. Vijay invested Rs. 4350 and received the amount of Rs. 5220 after two years. If he had invested on simple interest, then calculate the interest rate.
RPF Constable 19/01/2019 (Morning)
(a) 12.5% (b) 8% (c) 15% (d) 10%

RPF S.I.
(19/12/2018 to 16/01/2019)

Q.169. ₹4600 was invested at 8% per annum simple interest. If after 5 years that amount is withdrawn and half of the amount is invested in the stock market, then what will be the remaining amount (in ₹)?
RPF S.I. 19/12/2018 (Morning)
(a) 2880 (b) 4220 (c) 3220 (d) 3660

Q.170. The amount of 6800 rupees is given at an annual rate of 8% on simple interest. If after 5 years the amount was withdrawn and half of the total amount was invested in the stock market, then find the remaining amount?
RPF S.I. 10/01/2019 (Morning)
(a) Rs. 4,560 (b) Rs. 4,460
(c) Rs. 4,760 (d) Rs. 4,660

RRB ALP Tier - 1
(09/08/2018 to 31/08/2018)

Q.171. A sum of money invested for 2 years and 9 months at the rate of 8% simple interest per annum became ₹732

at the end of the period. What was the sum that was initially invested?
RRB ALP 10/08/2018 (Evening)
(a) ₹ 600 (b) ₹ 575 (c) ₹ 550 (d) ₹ 585

Q.172. At 6% simple interest per annum a sum of money became ₹ 834 in $6\frac{1}{2}$ years. The sum initially invested was:
RRB ALP 13/08/2018 (Morning)
(a) ₹ 650 (b) ₹ 600 (c) ₹ 675 (d) ₹ 626

Q.173. The interest earned on ₹ 2250 at the rate of 3% simple interest per annum for 2 years will be:
RRB ALP 13/08/2018 (Afternoon)
(a) ₹225 (b) ₹135 (c) ₹202.50 (d) ₹67.50

Q.174. At 8% simple interest per annum, a sum of money becomes ₹ 300 in $2\frac{1}{2}$ years. What was the sum invested?
RRB ALP 14/08/2018 (Afternoon)
(a) ₹275 (b) ₹240 (c) ₹250 (d) ₹260

Q.175. Rahi deposited ₹600 in a bank that promised 8% simple interest per annum. If Rahi kept the money with the bank for 5 years, she will earn an interest of:
RRB ALP 14/08/2018 (Afternoon)
(a) ₹480 (b) ₹240 (c) ₹280 (d) ₹200

Q.176. At 5% simple interest per annum, a certain sum yields a total amount of ₹ 2,790 at the end of $3\frac{1}{4}$ years. The sum invested was:
RRB ALP 17/08/2018 (Afternoon)
(a) ₹2,400 (b) ₹2,350 (c) ₹2,600 (d) ₹2,550

Q.177. The interest on ₹ 1250 for 6 years at the rate of 4% simple interest per annum will be:
RRB ALP 17/08/2018 (Afternoon)
(a) ₹350 (b) ₹300 (c) ₹360 (d) ₹375

Q.178. Saathi deposited ₹825 in a bank that promised 8% simple interest per annum. If Saathi kept the money with the bank for 5 years, she will earn an interest of:
RRB ALP 20/08/2018 (Morning)
(a) ₹330 (b) ₹290 (c) ₹480 (d) ₹280

Q.179. ₹x invested at 8% simple interest per annum for 5 years yields the same interest as that of ₹y invested at 7.5% simple interest per annum for 6 years. Find x: y.
RRB ALP 21/08/2018 (Morning)
(a) 16 : 15 (b) 40 : 45 (c) 9 : 8 (d) 5 : 6

Q.180. ₹x invested at 9% simple interest per annum for 5 years yields the same interest as that of ₹ y invested at 7.5% simple interest per annum for 4 years. Find x : y.
RRB ALP 29/08/2018 (Afternoon)
(a) 45 : 30 (b) 8 : 9 (c) 16 : 15 (d) 2 : 3

Q.181. What sum will yield ₹491.68 as simple interest at 8% per annum for 1 year and 2 months?
RRB ALP 29/08/2018 (Evening)
(a) ₹4364 (b) ₹4906 (c) ₹4758 (d) ₹5268

Q.182. The simple interest on a certain sum for 3 years at 8% p.a is ₹90 more than simple interest at 9% p.a for 2 years on the same sum. The sum is (in rupees):
RRB ALP 30/08/2018 (Afternoon)
(a) ₹1900 (b) ₹1500 (c) ₹1850 (d) ₹2250

Q.183. At 8% simple interest per annum a sum of money becomes ₹ 608 in $3\frac{1}{2}$ years. What was the sum invested ?
RRB ALP 30/08/2018 (Evening)
(a) ₹450 (b) ₹475 (c) ₹440 (d) ₹460

Q.184. The interest earned on ₹ 3,675 at the rate of 4% simple interest per annum for 2 years will be?
RRB ALP 31/08/2018 (Afternoon)
(a) ₹289.50 (b) ₹288.50 (c) ₹294 (d) ₹292

Q.185. A sum of ₹ 2,000, invested at the rate of 8.5% simple interest per annum for 6 years will yield an interest of:
RRB ALP 31/08/2018 (Evening)
(a) Rs 1275 (b) Rs 1020
(c) Rs 510 (d) Rs 935

Q.186. ₹x invested at 9% simple interest per annum for 5 years yields the same interest as that of ₹ y invested at 6.25% simple interest per annum for 8 years. Find x : y.
RRB ALP 31/08/2018 (Evening)
(a) 45 : 50 (b) 10 : 9 (c) 16 : 15 (d) 5 : 8

Answer key:-

1.(d)	2.(b)	3.(b)	4.(d)
5.(a)	6.(a)	7.(b)	8.(c)
9.(b)	10.(a)	11.(b)	12.(b)
13.(c)	14.(c)	15.(c)	16.(c)
17.(a)	18.(a)	19.(b)	20.(b)
21.(d)	22.(b)	23.(c)	24.(d)
25.(b)	26.(b)	27.(d)	28.(a)
29.(a)	30.(d)	31.(d)	32.(c)
33.(b)	34.(d)	35.(a)	36.(d)
37.(b)	38.(b)	39.(b)	40.(c)
41.(b)	42.(d)	43.(c)	44.(a)
45.(c)	46.(d)	47.(b)	48.(a)
49.(c)	50.(c)	51.(a)	52.(b)
53.(b)	54.(a)	55.(c)	56.(c)
57.(b)	58.(d)	59.(d)	60.(d)
61.(d)	62.(a)	63.(c)	64.(a)
65.(c)	66.(a)	67.(c)	68.(c)
69.(c)	70.(c)	71.(a)	72.(b)
73.(c)	74.(a)	75.(b)	76.(a)
77.(c)	78.(b)	79.(b)	80.(d)
81.(a)	82.(b)	83.(d)	84.(c)
85.(d)	86.(c)	87.(a)	88.(c)
89.(d)	90.(d)	91.(b)	92.(d)
93.(d)	94.(c)	95.(d)	96.(d)
97.(c)	98.(c)	99.(a)	100.(b)
101.(c)	102.(d)	103.(b)	104.(a)
105.(a)	106.(a)	107.(d)	108.(c)
109.(c)	110.(b)	111.(a)	112.(b)
113.(c)	114.(d)	115.(c)	116.(c)
117.(a)	118.(d)	119.(b)	120.(c)
121.(c)	122.(b)	123.(a)	124.(a)
125.(c)	126.(d)	127.(c)	128.(b)
129.(c)	130.(d)	131.(c)	132.(c)
133.(c)	134.(b)	135.(a)	136.(b)
137.(d)	138.(a)	139.(b)	140.(b)
141.(b)	142.(b)	143.(c)	144.(c)
145.(a)	146.(d)	147.(b)	148.(d)
149.(c)	150.(c)	151.(d)	152.(b)
153.(c)	154.(d)	155.(a)	156.(d)
157.(b)	158.(c)	159.(d)	160.(a)
161.(c)	162.(a)	163.(c)	164.(b)
165.(b)	166.(c)	167.(a)	168.(d)
169.(c)	170.(c)	171.(a)	172.(b)
173.(b)	174.(c)	175.(b)	176.(a)
177.(b)	178.(a)	179.(c)	180.(d)
181.(d)	182.(b)	183.(b)	184.(c)
185.(b)	186.(b)		

Solution:-

Sol.1.(d) Principal = ₹2000
Rate = 8.25%
Time =7 February to 20 April = 73 days
$= \frac{73}{365} = \frac{1}{5}$ year
S.I. = $\frac{PRT}{100} = \frac{2000 \times 8.25 \times 1}{100 \times 5}$ = ₹ 33

Sol.2.(b) Let the principal = P and rate of percent = R%
Amount for 5 years = ₹2000 .....(1)
Amount for 2 years = ₹1250.....(2)
S.I for 3 years = 2000 - 1250 = ₹750

Then, S.I for 2 years = ₹500
Now, Principal = A - S.I = 1250 - 500 = ₹750
Hence, rate % = $\frac{S.I \times 100}{P \times T}$
$= \frac{500 \times 100}{750 \times 2} = \frac{100}{3} = 33.33\%$

Sol.3.(b) S.I for 2 years of bank A
$= \frac{200000 \times 4.5 \times 2}{100} = 18000$
S.I for 2 years of bank B
$= \frac{200000 \times 5.5 \times 2}{100} = 22000$
Difference in S.I = 22000 - 18000 = ₹4000

Sol.4.(d)
S.I for 3 years = $\frac{30000 \times 5 \times 3}{100}$ = 4500
Now, required % = $\frac{4500}{18000} \times 100 = 25\%$

Sol.5.(a) Given, rate = 6.25 % and n (number of times) = 2
Time = $\frac{(n-1)\,100}{rate} = \frac{(2-1) \times 100}{6.25}$
= 100/6.25 $= 16\ years$

Sol.6.(a) Total sum = 47,740
Effective interest rate in 3 years
= 3 × 10 = 30%
Effective interest rate in next 4 years
= 4× 9 = 36%
Effective interest rate in next 5 years
= 5 × 8 = 40%
According to the question,
30A = 36B = 40C
A : B = 6 : 5, B : C = 10 : 9
On balancing the ratio,
A : B : C = 12 : 10 : 9
Total = 12 + 10 + 9 = 31 unit
Difference between sums invested in C and A = 12 - 9 = 3 unit
Now,
31 unit = 47,740 ⇒ 3 unit = 4620
So, Required difference = 4,620

Sol.7.(b) Rate of interest = $\frac{75}{10}$ = 7.5%
Interest earned in 6 years = 7.5 × 6 = 45%

Sol.8.(c) As per question,
$80{,}000 + \frac{80{,}000 \times 24 \times T}{100}$
$= 91{,}000 + \frac{91{,}000 \times 20 \times T}{100}$
$\frac{80{,}000 \times 24 \times T}{100} - \frac{91{,}000 \times 20 \times T}{100}$
= 11000
19,200T - 18200T = 11,000
1000T = 11,000 ⇒ T = 11

Sol.9.(b)
Given, Sum = ₹10,000 and rate% = 10%
Amount after 1st year = 10000 + 10% × 10000 = ₹11000
Principal after paying the 1st installment = 11000 - 3000 = ₹8000
Amount after 2nd year = 8000 + 10% × 8000 = ₹8800
Principal after paying the 2nd installment = 8800 - 2800 = ₹6000
Amount after 3rd year = 6000 + 10% × 6000 = ₹6,600

Sol.10.(a) Let the amount invested at 12% be x and amount invested at 10% be y.
$\frac{x \times 12 \times 1}{100} + \frac{y \times 10 \times 1}{100} = 125$
12x + 10y = 12500.....(1)
$\frac{y \times 12 \times 1}{100} + \frac{x \times 12 \times 1}{100} = 128$
12y + 10x = 12800.....(2)
By solving eq .(1) and (2),we get
X = ₹500 , y = ₹650
Hence, the amount invested at 10% = ₹650

Sol.11.(b)
SI for Ramesh = $\frac{8000 \times 5 \times 3}{100}$ = 1200
SI for Manohar = $\frac{8000 \times 7 \times 3}{100}$ = 1680
Gain = 1680 - 1200 = Rs 480

Sol.12.(b) Let , Total amount = 14x
Then ratio of the amount = 2x : 7x : 5x
Now , A/Q
$2 \times \frac{4x}{100} + 7 \times \frac{5x}{100} + 5 \times \frac{6x}{100} = 730$
$\rightarrow \frac{8x}{100} + \frac{35x}{100} + \frac{30x}{100} = 730$
$\rightarrow \frac{73x}{100} = 730 \rightarrow 73x = 73000$
→ X = 1000
Hence , Total amount
= 14x = 14 × 1000 = 14000 Rs.

Sol.13.(c) Let the Principal = 100%
Total interest in 3 years = 2% + 3% + 4% = 9%
Amount = Principal + Interest
A = 100 % + 9% , A = 109%
According to question,
109% = 5000
$100\% = \frac{5000}{109} \times 100 = \frac{5000}{1.09}$

Sol.14.(c)
SI for 4 years = $\frac{12200 \times 2 \times 4}{100} = 976$
New principal for next 4 year
= 12200 + 976 = 13176
SI for next 4 year = $\frac{13176 \times 2 \times 4}{100}$
$= 1054.08$ Rs.

Sol.15.(c) If SI received is equal in all cases
$P_1 : P_2 : P_3 = \frac{1}{R_1T_1} : \frac{1}{R_2T_2} : \frac{1}{R_3T_3}$
$= \frac{1}{10 \times 6} : \frac{1}{12 \times 10} : \frac{1}{15 \times 12}$
$= \frac{1}{60} : \frac{1}{120} : \frac{1}{180}$ = 6 : 3 : 2

Sol.16.(c) Ratio of SI obtained from all parts = $\frac{1}{4} \times \frac{7}{2} : \frac{1}{3} \times \frac{15}{2} : \frac{5}{12} \times 8$
$= \frac{7}{8} : \frac{5}{2} : \frac{10}{3}$
Total SI = $\frac{7}{8} + \frac{5}{2} + \frac{10}{3}$
$= \frac{21 + 60 + 80}{24} = \frac{161}{24}\%$
A/Q,
$\frac{161}{24}\% = 2576$
P= 100% = $\frac{2576}{161} \times 24 \times 100$
$= Rs\ 38400$

Sol.17.(a) Let , P = 1 , A = 3 , SI = 2 , time = 8 yrs
SI = $\frac{PRT}{100} \Rightarrow 2 = \frac{1 \times R \times 8}{100}$
⇒ R = 25%
Now , for 2nd condition
P = 1 , Time = 12 yrs , R = 25%
SI = $\frac{PRT}{100} \Rightarrow$ SI= $\frac{1 \times 25 \times 12}{100} \Rightarrow$ SI = 3
A = P + SI = 1+ 3
A = 4 Times

Sol.18.(a) If the rate of interest is 2% higher then the SI obtained is 2% more
Extra SI = 6272 - 5768 = 504 Rs.
A/Q,
$\frac{P \times 2 \times 7.2}{100} = 504 \rightarrow$ P = 3500 Rs.

Sol.19.(b) Total rate of interest
$= (2 \times 6\%) + (2 \times 7\%) + (3 \times 8\%)$
= 50%
Total S.I. in 7 years → $P \times \frac{50}{100} = \frac{P}{2}$

Sol.20.(b) Let the principal be 100%
Extra SI earned for 1 year i.e. (5 - 4) year at the rate of 7.5% = 7.5% which corresponds to ₹375
Then, 100% corresponds to
$\frac{375}{7.5} \times 100$ = ₹5,000

Sol.21.(d) Given, Principal = ₹75000 , rate = 7.5% and time = 6 years
Effective rate of interest = 7.5 × 6 = 45%
Amount after 6 years = $\frac{145}{100} \times 75000$
$= ₹1,08,750$

Sol.22.(b) Let the principal be ₹ x
Principal + S.I = Amount

$x + \frac{x \times 2 \times 12.5}{100} = 8250$

$\Rightarrow \frac{5x}{4} = 8250$

$\Rightarrow x = \frac{8250 \times 4}{5} = 6600$

Now,S.I = $\frac{x \times 2 \times 12.5}{100} = \frac{6600 \times 2 \times 12.5}{100}$

$= ₹1,650$

Sol.23.(c) Interest = $\frac{200000 \times 7 \times 2}{100}$

= ₹28000

Sol.24.(d) Principal = ₹1232 , Rate% = 5% , Time = 3 years

S.I = $\frac{1232 \times 5 \times 3}{100} = ₹184.80$

Amount = P + S.I = 1232 + 184.80

= ₹1,416.80

Sol.25.(b) Let the sum be ₹x

$\frac{x \times 5.5 \times 18}{100 \times 12} - \frac{x \times 6 \times 14}{100 \times 12} = 62.5$

$\Rightarrow \frac{33x}{400} - \frac{7x}{100} = 62.5$

$\Rightarrow \frac{5x}{400} = 62.5 \Rightarrow x = \frac{62.5 \times 400}{5}$

$= ₹5000$

Sol.26 .(b) Let the principal be x.

Rate % = $\frac{3x \times 100}{5x \times 12} = 5\%$

Sol.27.(d) Time = $\frac{(n-1) \times 100}{r}$

$= \frac{(2-1) \times 100}{10}$ = 10 Years

Sol.28.(a) Let the rate per annum be x %

S.I for 2 years at x % = 2x %

S.I for 2 years at (x + 2) % = 2 (x + 2)%

difference in simple interest = 2 (x + 2)% - 2x % = 4%

$4\% \rightarrow 240 \Rightarrow 1\% \rightarrow 60 \Rightarrow 100\% \rightarrow 6000$

So, the sum invested = ₹6,000

Sol.29.(a) according to given question 8000 due in one year .but trader want to settle after two months

P.W. (present wealth) = $\frac{100 \times Amount}{100 + (R \times T)}$

$= \frac{100 \times 8000}{100 + (9 \times \frac{10}{12})} = \frac{100 \times 8000}{107.5}$

$= 7441.86 \approx 7442$

Sol.30.(d) Principal =₹10,000 , time = 2 years , S.I = ₹ 2000

Rate % = $\frac{2000 \times 100}{10000 \times 2} = 10\%$

Sol.31.(d) Required amount = Present worth of Rs. 10500 due in 8 months hence

Present worth(p.w) = $\frac{100 \times Amount}{100 + (R \times T)}$

where R = rate of interest

T = time (in year)

According to question, trader wants to settle after 4 months . And the given amount is due in one year.

So T = 12 - 4 = 8 months = $\frac{8}{12}$ year

Now P.W. = $\frac{100 \times 10500}{100 + (6 \times \frac{8}{12})}$

$= \frac{100 \times 10500}{100 + (4)} = \frac{1050000}{104}$ = 10,096

Sol.32.(c) Principal = ₹4,800 ,Rate = 15% and S.I = ₹2,160

Time = $\frac{2160 \times 100}{4800 \times 15} = 3\ years.$

Sol.33.(b) S.I = ₹3553, Rate = 9.5%, Time = 4.4 years

Then, P = $\frac{S.I. \times 100}{R \times T} = \frac{3553 \times 100}{9.5 \times 4.4}$

$= 8,500$

Now, New S.I = $\frac{8500 \times 7.5 \times 8.4}{100} = 5355$

Amount = P + S.I = 8500 + 5355

= ₹13,855

Sol.34.(d) Let the principal be ₹x

Then S.I = ₹$\frac{11x}{25}$, Time = 8 years

Rate % = $\frac{11x \times 100}{25 \times x \times 8} = 5\frac{1}{2}\%$

Sol.35.(a) Interest for 7 years

= 9250 - 7500 = ₹ 1750

So, interest for 1 year = $\frac{1750}{7}$ = ₹ 250

Therefore, rate of interest = $\frac{S.I. \times 100}{P \times T}$

$= \frac{250}{7500} \times 100 = 3\frac{1}{3}\%$

Sol.36.(d) Effective rate of interest for 4 year = 4 × 6 = 24%

Therefore amount = 5800 × $\frac{124}{100}$

= ₹7192

Sol.37.(b) Interest for 1 year (365 days) = 365 × 2= 730

Simple interest = $\frac{P \times R \times T}{100}$

$\Rightarrow 730 = \frac{P \times 25 \times 1}{100}$

So, P = ₹2920

Sol.38.(b) ATQ,

Principal : interest

5 : 2

Now, $\Rightarrow 2 = \frac{5 \times R \times 3}{100}$

So, R = $\frac{40}{3}\%$

Sol.39.(b) let annual installment = 100 unit

Amount in first year = 100

Amount in 2nd year = (100 + 10 ×1) = 110

Amount in 3rd year= (100 + 10 ×2)= 120

Amount in 4th year = (100 + 10 ×3) = 130

Amount in 5th year = (100 + 10 ×4) = 140

Total Amount = 100 + 110 + 120 + 130 + 140 = 600 unit

Now , 600 unit = 9600

Then , 100 unit = ₹ 1600

Short trick : Annual Instalment in SI = $\frac{100A}{100t + \frac{rt(t-1)}{2}}$

$\Rightarrow \frac{100 \times 9600}{100 \times 5 + \frac{10 \times 5(5-1)}{2}} = 1600$

Sol.40.(c) Given, P = ₹220000, rate 8 %

S.I for the first year = $\frac{220000 \times 8 \times 1}{100}$

$= ₹17600$

Now, principal after giving 27600, P

= 220000 - 27600 = 192400

S.I for the 2nd year = $\frac{192400 \times 8 \times 1}{100}$

$= ₹15392$

Now, S.I for two years = 17600 + 15392

= ₹32992

So, Amount = 32992 + 192400

= ₹2,25,392

Sol.41.(b) Given, S.I = ₹3,000 , rate = 6% and time = 4 years.

P = $\frac{S.I \times 100}{R \times T} = \frac{3000 \times 100}{6 \times 4}$ = ₹12,500

Sol.42.(d) Required rate %

$= \frac{(n-1)\ 100}{time} = \frac{(2-1) \times 100}{10}$

$= \frac{100}{10} = 10\%$

Sol.43.(c) Let the sum invested be P and rate be R%.$\frac{P \times R \times 4}{100} + 640$

$= \frac{P \times (R+2) \times 4}{100} \Rightarrow \frac{P \times R \times 4 + 64000}{100}$

$= \frac{P \times (R+2) \times 4}{100}$

$\Rightarrow 4PR + 64000 = 4PR + 8P$

$\Rightarrow 8P = 64000 \Rightarrow P = 8,000$

Hence, the amount invested = ₹8,000

Sol.44.(a) Given, S.I = ₹20,250

rate% = 9 % and time = 1 year

$P = \frac{S.I \times 100}{R \times T} = \frac{20250 \times 100}{9}$

$= ₹2,25,000$

Sol.45.(c) Given, Principal = ₹13,000 , time = 4 years and rate = 5 %

S.I = $\frac{PRT}{100} = \frac{13000 \times 4 \times 5}{100} = ₹2,600$

Sol.46.(d) Total amount returned to the Bank = ₹4000 + ₹4350 = ₹8350

Loan amount = ₹7000
Interest =₹8350 -₹7000 = ₹ 1350.
Here we have two time spans: 7000 for 3 years and 3000 for 2 years

$1350 = \frac{(7000 \times 3 \times R) + (3000 \times 2 \times R)}{100}$

= 210R + 60R = 270R

Therefore, Rate of Interest = $\frac{1350}{270}$ = 5%

Sol.47.(b) SI = $\frac{P \times R \times T}{100}$

⇒ SI = 2360 - 2000

⇒ SI = Rs. 360 ⇒ 360 = $\frac{2000 \times R \times 3}{100}$

⇒ 360 = 60 R ⇒ R = 6%

Now, Principal is same and rate is 6% and time is 5 year

SI = $\frac{2000 \times 6 \times 5}{100}$ → SI = Rs.600

Amount = Rs. 2000 + Rs.600
Amount = Rs.2600

Sol.48.(a) Let the sum borrowed be ₹x.
Effective rate % = 12.5 × 3 = 37.5%

$\frac{137.5}{100} x = 19800 \Rightarrow x = ₹14,400$

Sol.49.(c)
S.I for 1 year = (1500 - 1200) = 300
S.I for 2 years = 600
So Principal = 1200 - 600 = 600

Now, Rate % = $\frac{S.I \times 100}{P \times T} = \frac{600 \times 100}{600 \times 2}$

$= 50\%$

Sol.50.(c) Let the principal = 6 unit

Simple interest = $\frac{1}{6}$ × principal

Time = 6 year

SI = $\frac{6 \times R \times 6}{100} \Rightarrow 1 = \frac{6 \times R \times 6}{100}$

⇒ R = $\frac{100}{36} = \frac{25}{9}$

According to question,

(6000 - P) = $\frac{P \times 25 \times 3}{100 \times 9}$

72,000 - 12P = P ⇒ 13P = 72000
⇒ P = 5538.46

Sol.51.(a)

$\frac{7250 \times 1 \times R}{100} + \frac{3625 \times 2R \times 6}{100 \times 12} = 335$

⇒ 72.5R + 36.25R = 335
⇒ 108.75R = 335 ⇒ R = 3.08%

Sol.52.(b) Present worth (p.w)

= $\frac{100 \times Amount}{100 + (R \times T)}$

where R = rate of interest
T = time (in year)

According to the question, the trader wants to settle after 4 months . And the given amount is due in one year.

So T = 12 - 4 = 8 months = $\frac{8}{12}$ year

Now P.W. = $\frac{100 \times 9000}{100 + (6 \times \frac{8}{12})}$

= $\frac{100 \times 9000}{104}$ = 8653.84 ≅ 8654

Sol.53.(b) Overall interest rate per annum = $\frac{325}{5000} \times 100 = 6.5\%$

By alligation method,

Part A	Part B
5%	10%
6.5%	
3.5	1.5

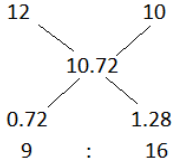
Ratio of A : B = 3.5 : 1.5 or 7 : 3
According to question,
10 unit = 5000 ⇒ 7 unit = 3500
Money deposited in bank A = 3500

Sol.54.(a) If rate is 8% higher for 8 years period, then overall percentage increase = 64%
According to question,
⇒ 64% = 4000 ⇒ 100% = 6250
So, Invested sum = 6,250

Sol.55.(c)
Total interest in two years = ₹1,072
So, interest for one year = ₹536
Effective interest rate on entire sum

= $\frac{536}{5000} \times 100 = 10.72\%$

Using alligation method on rate,



So, sum invested at 12% interest rate = $\frac{9}{25} \times 5000$ = ₹1,800

Sol.56.(c)
Let interest earned each year be "x"

$4750 + 5\frac{1}{2}x = 6840$

$\frac{11}{2}x = 6840 - 4750 = 2090$

$x = 2090 \times \frac{2}{11} = 380$

Interest rate = $\frac{380}{4750} \times 100 = 8\%$

Sol.57.(b) Let principal = 100 units.

Interest earned in first case = $3\frac{1}{3}$ × 15% of 100 = 50 units.

Interest earned in second case = $5\frac{1}{2}$ × 12% of 100 = 66 units.
ATQ, 66 - 50 = 16 units = ₹1840
1 unit = ₹115
Principal = 100 units = ₹11,500

Sol.58.(d)
Amounts at x% in 7 years = 22494
Amount at (x + 4)% in 7 years = 25917
Difference in amount = 25917 - 22494 = 3,423
As per question,
4% × 7 = 3423 ⇒ 28% = 3423
100% = 12225
So, sum invested = 12,225

Sol.59.(d)
Amount after 5 years = 9800
Amount after 10 years = 12,600
Interest in 5 years = 12600 - 9800 = 2800
Interest in 1 year = 560
Principal = 9800 - 2800 = 7000

Rate = $\frac{560}{7000} \times 100 = 8\%$

Sol.60.(d)
Amount is 26.5 more, if rate is 2% higher
So,
2% = 26.5 ⇒ 100% = 1325
Principal = 1325
Amount = 1484
Interest = 1484 - 1325 = 159

$159 = \frac{1325 \times R \times 1}{100} \Rightarrow R = 12\%$

Required interest = $\frac{1325 \times 12 \times 1}{100} \Rightarrow$ ₹159

Sol.61.(d) Rate is 2% higher,
Effective rate percent in 3 years = 6%
As per question,
6% = 84 ⇒ 100% = 1400
So, sum invested = 1400

Sol.62.(a) $25.5 = \frac{850 \times 3.6 \times T}{100 \times 12}$

T = 10 months

Sol.63.(c)

160% means principal becomes $\frac{8}{5}$ times

Rate % = $\frac{(n-1) \times 100}{time}$

$= \frac{(\frac{8}{5} - 1) \times 100}{5} = 12\%$

Time = $\frac{(n-1) \times 100}{rate} = \frac{(2-1) \times 100}{12}$

$= 8\frac{1}{3} years.$

Sol.64.(a) Rate % = $\frac{(n-1) \times 100}{time}$

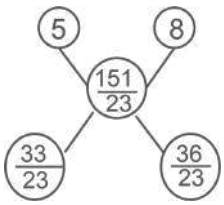
$= \frac{(\frac{13}{8} - 1) \times 100}{10} = \frac{500}{80} = 6.25\%$

Sol.65.(c) 3 years S.I. = Rs.1812

1 year S.I. = $\frac{1812}{3}$ = Rs.604

Rate = $\frac{604}{9200} \times 100 = \frac{151}{23}\%$

Using alligation method on rate,



Now ratio = 11:12

Amount lent at 5%

= $\frac{11}{23} \times 9200 = ₹4400$

Sol.66.(a)

S.I = $\frac{48750 \times 16 \times 73}{100 \times 365} = ₹1560$

Sol.67.(c) Let the invested money be x

Now, $13464 = x + \frac{x \times 6 \times 14.5}{100}$

$\Rightarrow x = ₹7,200$

Sol.68.(c) Let the period be T years.

Time = $\frac{7830 \times 100}{14500 \times 9} = 6\ years$

Sol.69.(c) Let the part lent out at 10% is x,

According to the question,

$\Rightarrow \frac{x \times 10 \times 5}{100} = \frac{(2600 - x) \times 9 \times 6}{100}$

$\Rightarrow x = \frac{2600 \times 9 \times 6}{104} \Rightarrow x = 1350$

So, The part lent out at 10% is 1350.00 Rs.

Short Tricks:-

According to question '

50% of x = 54% of y

Now, $\frac{x}{y} = \frac{54}{50} = \frac{27}{25}$

52 units = 2600 Rs. ⇒ 1 unit = 50 Rs.

The part lent out at 10% = 27 units

= 27 × 50 = 1350 Rs.

Sol.70.(c) Let the amount of money that was lent out at 10% simple interest per annum = x

$\Rightarrow \frac{T}{100} \times (P_1R_1 + P_2R_2) = 1750$

$\Rightarrow \frac{5}{100} \times (10x + (5000 - x)5) = 1750$

$\Rightarrow$ x = 7000 - 5000 $\Rightarrow$ x = 2000

Sol.71.(a) As we know, Simple Interest (S.I.) = $\frac{PRT}{100}$

Now let the interest will become 1500 in t years.

$\Rightarrow \frac{5000 \times 10 \times t}{100} = 1500 \Rightarrow$ t = 3

Sol.72.(b) As we know, simple interest

$= \frac{PRT}{100}$

Here P = 24000, R = t and S.I. = 19440

$\Rightarrow 19440 = \frac{24000 \times R \times R}{100}$

$\Rightarrow R^2 = 81 \Rightarrow R = 9$

So, the rate of interest was 9%.

Sol.73.(c) Let the rate of interest = R%

SI obtained from Dubey

= $\frac{7200 \times R \times 3}{100}$ = 216R

SI obtained from Raghav

= $\frac{8400 \times R \times 4}{100}$ = 336R

Total SI = 216R + 336R= 552R

Interest obtained is Rs 4,968

So, 552R = 4968 $\Rightarrow$ R = $\frac{4968}{552}$ = 9%

Sol.74.(a) Amount = Principal + simple interest , A = P + SI

Sol.75.(b)

Rate of interest = 15% per annum

Time duration from 26 March 2018 to 7 June 2018 = 73 days

For 365 days ------ Rate of interest= 15%

73 days ------- rate of interest =

$\frac{15 \times 73}{365}$ = 3%

3% of 4,500 = 135

Amount = P + SI = 4,500 + 135 = Rs 4,635

Sol.76.(a) Let the principal invested = 100

SI obtained by Rahim = $\frac{100 \times 5 \times 3}{100}$ = 15

And SI obtained by Hiralal = $\frac{100 \times 7 \times 2}{100}$

= 14

Difference of SI = 1 which is equal to Rs 30,

$\therefore$ P = 100 × 30 = Rs 3000

Sol.77.(c) Dalip Rai borrowed Rs 24,000 from Amarjeet at a simple interest of 9% per annum.

So, the sum he will have to return after 3 years,

A = P(1 + $\frac{R \times T}{100}$)

= 24000 × (1 + $\frac{9 \times 3}{100}$) = 30,480 Rs.

Sol.78.(b)

Let the rate of interest per annum = R%, at which Lalit gave a loan of Rs 12000 to his friend Tarun at simple interest for 2 years.

According to the question :

$\Rightarrow \frac{12000 \times R \times 2}{100} = 1200 \Rightarrow R = 5$

So, the rate of interest per annum is 5 %.

Sol.79.(b) Let P = 100

A = 150 , R = 6% , SI = 50

50 = $\frac{100 \times 6 \times T}{100}$

$\Rightarrow$ 6T = 50 $\Rightarrow$ T = $\frac{25}{3} = 8\frac{1}{3}$ years

Sol.80.(d)

Extra SI obtained due to increased rate = $\frac{800 \times 4 \times 3}{100}$ = Rs 96

New Amount = 920 + 96 = Rs 1,016

Sol.81.(a)

rate of interest = 8% p.a, Time = 5 years.

S.I. = Rs 6,400 .

Let the principal amount borrowed by Ravi = P

$\Rightarrow \frac{PRT}{100} = 6400$

$\Rightarrow P = \frac{6400 \times 100}{8 \times 5} \Rightarrow P =$ Rs. 16000

Sol.82.(b) Let the principle = P, rate = R

SI = $\frac{P \times R \times T}{100} = \frac{P \times R \times 15}{100}$

given SI = $\frac{3}{4}$ × P

$\Rightarrow \frac{P \times R \times 15}{100} = \frac{3}{4} \times P \Rightarrow$ R = 5%

Sol.83.(d) When R = T

R = $\sqrt{\frac{SI \times 100}{P}}$

= $\sqrt{\frac{768 \times 100}{1200}} = \sqrt{64} = 8\%$

Sol.84.(c) In 3 year SI = 15000 - 12000 = 3000

In 6 years SI will be = 6000

$\therefore$ P = 12000 - 6000 = 6000

SI = $\frac{PRT}{100}$

$\Rightarrow 3000 = \frac{6000 \times R \times 3}{100}$

$\Rightarrow R = \frac{3000 \times 100}{6000 \times 3} = \frac{50}{3} = 16\frac{2}{3}\%$

Sol.85.(d) Let , Principal = X

SI = $\frac{PR\,T}{100} \Rightarrow$ SI = $\frac{P \times 8 \times 3}{100}$

$\Rightarrow$ SI = $\frac{6x}{25}$

For CI ,

P = 4000

R % = 10%

10 : 11

10 : 11

(P)100 : 121(A)

And CI = A - P

Now , 100 unit = 4000 Rs

So 21 unit = 840

A/Q ,

SI = $\frac{CI}{2}$

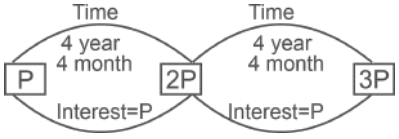
$\frac{6x}{25} = \frac{840}{2} \Rightarrow x$ = 1750 Rs

Sol.86.(c) Let the Principal = 100
A= 200
SI = A - P = 200 - 100 = 100
Given that, T = 12 years
SI = $\frac{PRT}{100}$
$\Rightarrow 100 = \frac{100 \times R \times 12}{100}$
$\Rightarrow R = \frac{100}{12} \frac{25}{3} = 8\frac{1}{3}\%$

Sol.87.(a) P = 12000 - 2000 = 10000
SI = $\frac{10000 \times 10 \times 1}{100} = 1000$
Total amount paid by man = 12000 + 1000 = Rs 13000

Sol.88.(c) Time = 2 year
Amount =240 Rs
Two years SI percentage difference = 2×3 = 6%
6% of amount = 240
1%.....40
100%.....4000

Sol.89.(d) Let Principal = P and Interest in 4 year 4 month = P



Total time required to triple the principal at same rate → (4 years 4 months) x 2
= 8 years and 8 months = $8\frac{2}{3}$years

Sol.90.(d) Let the amount lent at 6% per annum = 100x
And the amount lent at 4% per annum = 100y
A/Q,
100x + 100y = 7000
$\Rightarrow x + y = 70 \quad ------ \quad (1)$
SI obtained from 100x in 5 years
$= \frac{100x \times 6 \times 5}{100} = 30x$
SI obtained from 100y in 5 years
$= \frac{100y \times 4 \times 5}{100} = 20y$
A/Q,
$30x + 20y = 1600$
$\Rightarrow 3x + 2y = 160 \quad ------ \quad (2)$
On solving equation (1) and (2), we get
$x = 20 \; and \; y = 50$
Amount lent at 6% per annum = $100 \times 20 = Rs\; 2000$

Sol.91.(b) we know that,
$SI = \frac{P \times T \times R}{100}$
According to question,
$(SI)_1 = \frac{P \times 8 \times 3}{100}$
Now , for time = 2 yrs. And R = 9%
$(SI)_2 = \frac{P \times 2 \times 9}{100}$
Then, difference between $(SI)_1$ and $(SI)_2$
$= \{\frac{24P}{100} - \frac{18P}{100}\}$
$96 = \{\frac{24P}{100} - \frac{18P}{100}\}$
$96 = P\{\frac{24}{100} - \frac{18}{100}\} \Rightarrow$ P = 1600

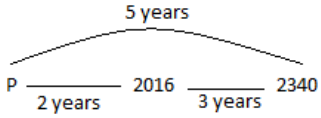
Sol.92.(d)
P = 800 , Time = 3 year ,Rate - 6% , 8% and 10% per annum respectively
I = $\frac{800 \times 6 \times 1}{100} + \frac{800 \times 8 \times 1}{100} + \frac{800 \times 10 \times 1}{100}$ = 48 + 64 + 80 = Rs.192

Sol.93.(d) Let the P = 100
100 ---------- 300 ---------- 500
15 years
SI = 300 - 100 = 200
In 15 years we get interest of 200, so in the next 15 years we get 200 as interest.
Therefore in 30 years the principal becomes 500 from 100.

Sol.94.(c)
SI = $\frac{PRT}{100} = \frac{10000 \times 15 \times 2}{100} = Rs\; 3000$

Sol.95.(d) SI = $\frac{PRT}{100}$
$\Rightarrow 900 = \frac{5000 \times R \times 1}{100}$
$\Rightarrow R = \frac{90000}{5000} = 18\%$
Now, SI = $\frac{8000 \times 18 \times 5}{100} = 7200$
Amount after 5 years = 8000 + 7200
= Rs 15200

Sol.96.(d)



SI for 3 years = 2340 - 2016 = 324
SI for 1 year = $\frac{324}{3} = 108$
SI for 2 years = $108 \times 2 = 216$
P = 2016 -216 = Rs 1800

Sol.97.(c) Given , SI at end of 7 years = 56% of Principal
Rate = 8%
Time = $\frac{100}{8}$ = 12 years 6 months

Sol.98.(c) An amount becomes eight-fifth of the original amount, it means that If P = 500 then A = 800
SI = 800 - 500 = 300
Given that, T = 5 years
Rate of interest = $\frac{SI \times 100}{P \times T} = \frac{300 \times 100}{500 \times 5}$
$= 12\%$
Short Trick:
An amount becomes eight-fifth of the original amount, it means that
$\frac{8}{5} = \frac{Amount}{Principal}$
So, Simple Interest = 8 - 5 = 3
Rate = $\frac{S.I. \times 100}{Principal \times Time} = \frac{3 \times 100}{5 \times 5}$
= 12 years

Sol.99.(a) Let the P = 100
A = 200
SI = A - P = 200 - 100 = 100
SI = $\frac{PRT}{100}$
$\Rightarrow 100 = \frac{100 \times R \times 10}{100} \Rightarrow$ R = 10%

Sol.100.(b)
Given, R = 5 % , A = 175 , T= 8 years
Amount = Principal (1 + $\frac{RT}{100}$)
175 = P (1+$\frac{5 \times 8}{100}$) = P = 125

Sol.101.(c) Let the rate of interest = r %
SI = $\frac{1200 \times r \times 3}{100} = 36r$
Let the 2nd rate of interest = R%
SI = 36R
DIfference of SI = 36(R -r) = 10.80
(R - r) = $\frac{10.80}{36} = 0.3\%$

Sol.102.(d) Let the capital = 100x
SI from 1st part = $\frac{2 \times 100x \times 6 \times 1}{3 \times 100} = 4x$
SI from 2nd part = $\frac{20x \times 10 \times 1}{100} = 2x$
Remaining capital = 100x - 20x - $\frac{200x}{3}$
= 80x - $\frac{200x}{3} = \frac{40x}{3}$
SI from 3rd part = $\frac{40x \times 15 \times 1}{3 \times 100} = 2x$
Total SI = 4x + 2x +2x = 8x = 600
$\Rightarrow x = 75$
P = $100 \times 75 = Rs\; 7500$

Sol.103.(b) After 4 years she returned $\frac{6}{5}$ of borrowed money .
If P = 5 then A = 6
SI = 6 - 5 = 1
SI = $\frac{PRT}{100}$
$\Rightarrow 1 = \frac{5 \times R \times 4}{100} \Rightarrow R = \frac{100}{20} = 5\%$
Short Trick:
Amount : principal
6 : 5

Total interest rate = $\frac{1}{5}$ = 20% for 4 year

Then annual rate of interest = $\frac{20}{4}$ = 5%

Sol.104.(a)
The SI for 5 years = 1020 - 720 = 300
SI for 1 year = $\frac{300}{5}$ = Rs.60
SI for 2 year = Rs 120
P = A - SI = 720 - 120 = Rs 600

Sol.105.(a)
+P +P
P----------2P----------3P
10 yr 10 yr
Total time = 10+10 = 20 years

Sol.106.(a)
Rate = 1 paisa per rupee per month i.e. 12 paise in 1 year
R = $\frac{12}{100} \times 100 = 12\%$
SI = $\frac{2000 \times 12 \times 4}{100} = Rs\ 960$

Sol.107.(d)
Let the principal and simple interest for one year be X and Y respectively
7500 = X + 5Y ---------(i)
9200 = X + 7Y --------(ii)
From equation (i)&(ii)
2Y = 1700
Y = 850
Putting the value of Y in equation (i)
X = 3250
850 = $\frac{(3250 \times R \times 1)}{100}$ = R = 26 .2%

Sol.108.(c)
Amount after 6 years = Rs 2,368
Amount after 11 years = Rs 3,008
SI of 5 years = 3008 - 2368 = 640
SI of 1 year = $\frac{640}{5} = 128$
SI of 6 years = 640 + 128 = 768
P = A - SI = 2368 - 768 = 1600
SI = $\frac{PRT}{100}$
$\Rightarrow 128 = \frac{1600 \times R \times 1}{100}$
R = $\frac{128}{16} = 8\%$

Sol.109.(c) Amount after 2 years = 600
Amount after 7 year = 900
SI of 5 year = 900 - 600 = 300
SI of 1 year = 60
SI of 2 year = 120
P = A - SI = 600 - 120 = 480
R = $\frac{60}{480} \times 100 = 12.5\%$

Sol.110.(b) SI = $\frac{PRT}{100}$
$\Rightarrow 1500 = \frac{P \times 12 \times \frac{1}{12}}{100}$
$\Rightarrow P = 150000 = 1.5\ lakhs$

Sol.111.(a)
In 3 years Principal becomes Rs1,512
And in 4.5 years principal becomes RS 1,668
SI of 1.5 years = 1668 - 1512 = 156
SI of 3 years = Rs 312
P = A - SI
P = 1512 - 312 = 1200
SI = $\frac{PRT}{100}$
$\Rightarrow 312 = \frac{1200 \times R \times 3}{100}$
$\Rightarrow R = \frac{31200}{1200 \times 3} = \frac{26}{3}\%$

Sol.112.(b) Given , time = 12.5 yrs
Let , P = 100 , A = 300 , SI = 200
SI = $\frac{P \times R \times T}{100}$
200 = $\frac{100 \times R \times 12.5}{100}$
(R) = $\frac{200}{12.5}$ = R = 16%

Sol.113.(c)
Let , P = 100 , A = 140 , SI = 40 , R = 10%
SI = $\frac{P \times R \times T}{100}$
$\Rightarrow 40 = \frac{100 \times 10 \times T}{100}$
$\Rightarrow$ T = $\frac{4000}{1000}$ = 4 Yrs

Sol.114.(d) Let the P = 100
SI = 40
Rate of interest = $\frac{40}{8} = 5\%$
If we want SI = P = 100
SI = $\frac{PRT}{100} \Rightarrow 100 = \frac{100 \times 5 \times T}{100}$
T = 20 years

Sol.115.(c) P = 480
If Rate of interest is 2% higher , we will receive 2% more interest yearly
Extra SI in 5 years = 10%
10% of 480 = Rs 48

Sol.116.(c)
Let the amount invested in each bank = P
Total interest
=($\frac{P \times 12 \times 1}{100} + \frac{P \times 10 \times 1}{100}$)
1650 = P ($\frac{12}{100} + \frac{10}{100}$)
1650 = P $\frac{22}{100}$
P = $\frac{1650 \times 100}{22}$ $\Rightarrow$ P = 7500 Rs.

Sol.117.(a) The ratio of simple interest earned on a certain amount at the rate of 5% and 8% for 6 years and 3 years respectively = $(5 \times 6) : (8 \times 3) = 5 : 4$

Sol.118.(d) Given , P = 1 , A = 2 , SI = 1 , Time = 8 years
We know that , SI = $\frac{P \times R \times T}{100}$
1 = $\frac{1 \times R \times 8}{100}$
100 = 8 R $\Rightarrow$ R = $\frac{100}{8} = 12\frac{1}{2}\%$

Sol.119.(b) Let P = 100
SI for first 3 years = $6 \times 3 = 18$
SI for next 5 years = $9 \times 5 = 45$
SI for last 3 years = $13 \times 3 = 39$
Total SI = 18 + 45 +39 = 102
A/Q,
102 unit = Rs 8,160
P = 100 unit = $\frac{8160}{102} \times 100 = Rs\ 8000$

Sol.120.(c) SI = $\frac{P \times R \times T}{100}$
A/Q, $\frac{P \times 6 \times 7}{100} = \frac{P \times R \times 5}{100}$
42 = 5R
R = $\frac{42}{5}$ = 8.4%

Sol.121.(c) R = $\frac{25}{4}\% = \frac{1}{16}$
P : A
16 : 17
16 : 17
16 : 17
P : A = 4096 : 4913
A/Q,
4913 unit = Rs. 4913
P = 4096 unit = Rs 4096
SI for 3 year = $\frac{4096 \times 6.25 \times 3}{100} = Rs\ 768$

Sol.122.(b)
Given , P = 73000 , R = $13\frac{1}{3}\% = \frac{40}{3}$,
T = 10 months = $\frac{10}{12}$
SI = $\frac{P \times R \times T}{100} = \frac{73000 \times 40 \times 10}{100 \times 3 \times 12}$
= Rs. 8111 (approx)

Sol.123.(a) Given , P is same for both
For $(SI)_1$,R = 5 % and Time = 6 Yrs and
For $(SI)_2$, R = 8% and Time = 3 Yrs
Ratio of the SI is $(SI)_1 : (SI)_2$
= $\frac{P \times 5 \times 6}{100} : \frac{P \times 8 \times 3}{100}$
$(SI)_1 : (SI)_2$ = 30 : 24
$(SI)_1 : (SI)_2$ = 5 : 4

Sol.124.(a) SI = $\frac{P \times R \times T}{100}$
SI = $\frac{10000 \times 60 \times 1/2}{100}$ $\Rightarrow$ SI = 3,000

Sol.125.(c) If the annual rate of simple interest increases from 8% to $12\frac{1}{2}$%,
He would get extra interest of =12.5 - 8 = 4.5%
A/Q, 4.5% = 369
P = 100% = $\frac{369}{4.5} \times 100 = Rs\ 8,200$

Sol.126.(d) Let the P = 100
A = 200 (in 5 years)
SI = 200 - 100 = 100
R = $\frac{100}{5} = 20\%$
In 8 years,
SI = $20 \times 8 = 160$
New Amount after 8 years = 100 + 160 = 260
Now, $\frac{260}{100} = 2\frac{3}{5}\ times$

Sol.127.(c) Let the sum lent at 15% = 100x
And the sum lent at 10% = 100y
A/Q,
100x + 100y = 2700
$\Rightarrow x + y = 27$ ___(1)
SI of 1st part = $\frac{100x \times 15 \times 4}{100} = 60x$
SI of 2nd part = $\frac{100y \times 10 \times 6}{100} = 60y$
A/Q, 60x = 60y $\Rightarrow x = y$
From equation (1)
x = y = 13.5
The part of sum lent at 15% = $100 \times 13.5 = Rs.1350$

Sol.128.(b)
Rate of interest = $\frac{25}{4}\%\ per\ annum$
Time period = 73 days
Total SI = $\frac{3000 \times 25 \times 73}{100 \times 4 \times 365} = Rs\ 37.50$

Sol.129.(c) Let the principal = 100
A = 200
SI = 200- 100= 100 = SI = $\frac{PRT}{100}$
$\Rightarrow 100 = \frac{100 \times R \times 5}{100}$
$\Rightarrow R = \frac{100}{5} = 20\%$
New amount = 400
New SI = 400 - 100 = 300
$\frac{100 \times 20 \times T}{100} = 300$ $\Rightarrow$ T = 15 years

Sol.130.(d) Let R_1 = x % , R_2 = (x + 3)%, principal = P
SI = $\frac{P\,R\,T}{100}$
$\frac{P \times R_2 \times 2}{100} - \frac{P \times R_1 \times 2}{100} = 300$
On solving P = 5000 Rs

Sol.131.(c) Let SI of 1 year = x
A/Q,
P + $2x = 756$___(1)
P + $3.5x$ =873 ___(2)
On subtracting equation (1) from (2)
$\Rightarrow 1.5x = 117 \Rightarrow x = 78 \Rightarrow 2x = 156$
P = 756 - 156 = Rs 600

Sol.132.(c) Let the sum = x
SI = x - 340
$\Rightarrow \frac{PRT}{100} = x - 340$
$\Rightarrow \frac{x \times 4 \times 8}{100} = x - 340$
$\Rightarrow 32x$ = 100x - 34000
$\Rightarrow 68x = 34000 \Rightarrow x = \frac{34000}{68} = 500$

Sol.133.(d) Let the amount lent at 10% = 100x
The amount lent at 8% = 100y
100x +100 y = 30,000
x + y = 300 ___(1)
Interest obtained from both part = $\frac{100x \times 10 \times 3}{100} + \frac{100y \times 8 \times 3}{100}$
8280 = 30x + 24y
5x + 4y = 1380 __ (2)
On solving equation (1) and (2), we get
x = 180 and y = 120
Amount lent at 10% per annum = $100 \times 180 = Rs\ 18000$

Sol.134.(b) Let the P = 100
10% of 100=10 = a
10% of 10 = 1= b
CI of 2 years = 2a +b = $2 \times 10 + 1 = 21$
A/Q,
21 unit = Rs 630
SI of 3 years on same rate = $3 \times 10 = 30$
30 unit = $\frac{630}{21} \times 30 = Rs\ 900$

Sol.135.(a) Difference between the amount of 3 years and 4 years = 925 - 850 = 75
Interest in one year = 75
Hence , in 3 years amount will increase by = $75 \times 3 = 225$
Principle = (amount) - (SI)
Principle = 850 - 225 = 625 Rs

Sol.136.(b) SI = $\frac{PRT}{100}$
$\Rightarrow 10 = \frac{P \times 10 \times 10}{100} \Rightarrow P = Rs\ 10$

Sol.137.(d) Let P = 100 unit
SI obtained by Kumar = $10 \times 3 = 30$ unit
SI obtained by Arif = $20 \times 3 = 60$ unit
Remaining SI for Arif = 60 - 30 = 30 unit
A/Q,
30 unit = 1560
P = 100 unit = $\frac{1560}{30} \times 100 = Rs\ 5,200$

Sol.138.(a) Let the principal be Rs.P and rate be r%.
$\frac{P(r+4)\times2}{100} - \frac{P(r+4)\times2}{100}$ = 400
$P(r + 4) \times 2 - 2Pr = 400 \times 100$
$\Rightarrow 2Pr + 8P - 2Pr = 400 \times 100$
$\Rightarrow 8P = 40000 \Rightarrow P = 5000$
Hence, the original amount of money = Rs. 5000

Sol.139.(b) Given, P = Rs. 64 , time = 2 years , Amount = Rs. 83.20
S.I → 83.20 - 64 = Rs. 19.2
Rate% = $\frac{S.I \times 100}{P \times time} = \frac{19.2 \times 100}{64 \times 2}$ = 15%
Now, New S.I.
= $\frac{PRT}{100} = \frac{86 \times 15 \times 4}{100} = Rs.51.6$
Amount = P + S.I → 86 + 51.6
= Rs. 137.60

Sol.140.(b) Given, P = Rs. 5000 , rate = 4% and time = 2 years
S.I = $\frac{PRT}{100} = \frac{5000 \times 4 \times 2}{100} = 400$ Rs.
Now, P = Rs. 5000 , rate = 6.25% and time = 2 years
New S.I = $\frac{PRT}{100} = \frac{5000 \times 6.25 \times 2}{100} = 625$ Rs.
His overall gain in the transaction per year → $\frac{625-400}{2} = \frac{225}{2} = Rs.112.50$

Sol.141.(b) Rate = $\frac{(n-1)\times100}{time}$
Rate = $\frac{(2-1)\times100}{4} = \frac{(16-1)\times100}{t}$
$\Rightarrow \frac{100}{4} = \frac{15\times100}{t}$ $\Rightarrow$ t = 60 years

Sol.142.(b) Fractional value of $12.5\% = \frac{1}{8}$, $\frac{SI}{principal} = \frac{9}{8}$ and $\frac{time}{rate} = \frac{2x}{x}$
S.I = $\frac{Principal \times Rate \times Time}{100}$
$9 = \frac{8 \times 2x \times 1x}{100}$
$x^2 = \frac{900}{16} \Rightarrow$ x = $\frac{30}{4}$ = 7.5
So, time = 15 years , rate % = 7.5%

Sol.143.(c) Formula $\Rightarrow$ n - 1 = $\frac{rt}{100}$
where n = number of times and r = rate,
4 - 1 = $\frac{r \times 20}{100}$, 3 = $\frac{r}{5} \Rightarrow$ r = 15 %

Sol.144.(c) Formula $\Rightarrow$ n - 1 = $\frac{rt}{100}$
where n = number of times and r = rate,
2 - 1 = $\frac{r \times 30}{100} \Rightarrow 1 = \frac{3r}{10} \Rightarrow r = 3\frac{1}{3}$%

Sol.145.(a) A.T.Q,
P = 800, SI= (956 − 800) = 156, T = 3yr

156 = $\frac{800 \times R \times 3}{100}$ → R= 6.5%

Then the new rate = (6.5 + 4)= 10.5%

Therefore, new amount → 800 + $\frac{800 \times 21 \times 3}{2 \times 100}$ = 800+ 252= 1052 Rs

Sol.146.(d)

$\frac{x \times 2 \times 10}{100} + \frac{(16500-x) \times 2 \times 12}{100}$ = 3620

20x + 24(16500-x) =362000 ⇒ x = ₹ 8500

8500 is invested at 10% and 8000 is invested at 12%

Sol.147.(b)

$\frac{P_1 \times 4 \times 1}{100} = \frac{P_2 \times 6 \times 1}{100} = \frac{P_3 \times 8 \times 1}{100}$

$4P_1 = 6P_2 = 8P_3 \Rightarrow P_1 : P_2 : P_3 =$ 6 : 4 : 3

13 units = 2600 ⇒ 1 unit = 200 Rs.

Value of P_1 , P_2 and P_3 are 1200, 800,600 respectively .

Sol.148.(d) Let the principal = P and S.I. = 2P and time = 6 years

According to question,

R = $\frac{2P \times 100}{P \times 6} = \frac{100}{3}$%

Time required to become 8 times of principal → $\frac{7P \times 100 \times 3}{P \times 100}$ = 21 Year

Sol.149.(c) Let the principal = P

According to question ,

S.I. for 15 months − S.I.for 8 months = Rs.32.50

$\frac{P \times 7.5 \times 15}{100 \times 12} - \frac{P \times 8 \times 12.5}{100 \times 12}$ = 32.50

112.5P − 100P = 39000 Rs.

P → $\frac{39000}{12.5}$ = 3120 Rs.

Sol.150.(c) S.I. for 2 year

= 24080 − 20720 = 3360 Rs.

S.I. for 1 year = 1680 Rs.

S.I. for 4 year = 1680 × 4 = 6720 Rs.

Principal = Amount - S.I. = 20720 - 6720 = 14000 Rs.

Rate = $\frac{S.I. \times 100}{P \times T} = \frac{6720 \times 100}{14000 \times 4}$ = **12%**

Sol.151.(d) Simple interest in 3 years = 956 - 800 = 156

$\frac{800 \times R \times 3}{100} = 156 \Rightarrow$ **R =** 6.5%

Sol.152.(b) Let,the principal = P

S.I. = $\frac{P \times R \times T}{100} = \frac{P \times 24 \times 6}{100} = \frac{144P}{100}$

According to question ,

S.I. + P = 73200

→ $\frac{144P}{100}$ +P = 73200

$\frac{244P}{100}$ = 73200

→ P = $\frac{73200 \times 100}{244}$ = 30000 Rs.

Sol.153.(c) A.T.Q,

Let, the principal P

$\frac{P \times 6 \times 14}{12 \times 100} - \frac{P \times 8 \times 8}{12 \times 100}$ = 200

$\frac{7P}{100} - \frac{16P}{300}$ = 200

$\frac{21P - 16P}{300}$ = 200 → 5P = 60000

P = 12000 Rs.

Sol.154.(d) Let the sum be P

Given that rate is 5% higher than previous rate(R) then SI is 1200 more.

According to the question, we have

1200=P×$\frac{10}{100}$(5+R-R)

P= $\frac{1200}{50} \times 100 = 2400$

Sol.155.(a) P= 5000,

R=6.25%= $\frac{1}{16}$ per annum ,

T = $\frac{73}{365} = \frac{1}{5}$yr.

∴ SI= $\frac{5000 \times 1 \times 1}{16 \times 5}$ = 62.50 Rs

Sol.156.(d) Let, principal ⇒ P ,

Amount = 4P , then S.I. of 7 years = 3P

S.I. = $\frac{P \times R \times T}{100}$

⇒ 3P = $\frac{P \times R \times 7}{100}$, R = $\frac{300}{7}$%

Time required to become 16 times the principal ,

Time(T) = $\frac{S.I. \times 100}{P \times R}$

T = $\frac{15P \times 100 \times 7}{P \times 300}$ = 35 Years

Sol.157.(b) According to given question ,

156 = $\frac{800 \times 3 \times R}{100} \Rightarrow$ R=6.5%

Now if rate is increased by 4% so new rate become = 10.5% = $\frac{21}{2}$%

So the new S.I. = $\frac{800 \times 3 \times 21}{2 \times 100}$

⇒ 84 × 3 = 252

Therefore, gain in investment

=new S.I - previous S.I ⇒ 252-156= 96.

Sol.158.(c) Rate = 12%, Time = 5yr,

Simple Interest = 4800 Rs.

Therefore,

Principal = $\frac{100 \times Simple\ Interest}{Time \times Rate}$

→ $\frac{100 \times 4800}{5 \times 12}$ = 8000

Sol.159.(d) Simple Interest = $\frac{P \times R \times T}{100}$

⇒ $\frac{P \times 12 \times 5}{100}$ = 3720

P = $\frac{3720 \times 10}{6}$ = 6200

Sol.160.(a) Simple interest = $\frac{P \times R \times T}{100}$

= $\frac{7400 \times 12 \times 4}{100}$ = 3552

Now , amount = P + S.I. = 7400 + 3552 = 10952

Sol.161.(c) Simple Interest = $\frac{P \times R \times T}{100}$

⇒ $\frac{P \times 12 \times 5}{100}$ = 4500

P = $\frac{4500 \times 10}{6}$ = 7500

Sol.162.(a) Simple Interest = $\frac{P \times R \times T}{100}$

⇒ $\frac{8700 \times 12 \times 4}{100}$ = 4176

Amount = principal + S.I. ⇒ 8700 + 4176 = 12876

Sol.163.(c) Amount = principal + interest

Interest = 5832 - 4860 = 972

Simple Interest = $\frac{P \times R \times T}{100} \Rightarrow$

972 = $\frac{4860 \times R \times 2}{100}$

⇒ R = $\frac{972 \times 100}{4860 \times 2} \Rightarrow$ R = $\frac{972 \times 5}{486}$

⇒ R = 10%

Sol.164.(b) Simple interest = $\frac{P \times R \times T}{100}$

⇒ 4080 = $\frac{P \times 12 \times 5}{100}$

⇒ P = $\frac{4080 \times 100}{12 \times 5}$ = 6800

Sol.165.(b) Simple Interest = $\frac{P \times R \times T}{100}$

⇒ Simple Interest = $\frac{8000 \times 12 \times 4}{100}$

⇒ Simple Interest = 80 × 48

⇒ Simple Interest = 3840

Amount = principal + interest

Amount = 8000 + 3840 = 11840 Rs.

Sol.166.(c) Simple Interest = $\frac{P \times R \times T}{100}$

⇒ 3900 = $\frac{P \times 12 \times 5}{100}$

⇒ P = $\frac{3900 \times 100}{12 \times 5}$

= $\frac{325 \times 100}{5}$ = 6500

Sol.167.(a) Simple Interest = $\frac{P \times R \times T}{100}$

⇒ $\frac{7700 \times 12 \times 4}{100}$ = 3696

Amount = principal + S.I. ⇒ 7700 + 3696 = 11396

sol.168.(d) Amount = principal + interest

Interest = 5220 - 4350 = 870

Simple Interest = $\frac{P \times R \times T}{100} \Rightarrow 870$

$= \frac{4350 \times R \times 2}{100} \Rightarrow R = \frac{870 \times 100}{4350 \times 2}$

$\Rightarrow R = \frac{870 \times 5}{435} \Rightarrow R = 10\%$

Sol.169. (c) Simple Interest = $\frac{P \times R \times T}{100}$

$= \frac{4600 \times 8 \times 5}{100} = 1840$

Total amount = 4600 + 1840 = 6440

Amount invested in share market

$= \frac{6440}{2} = 3220$

Remaining amount = 6440 - 3220 = 3220

Sol.170.(c) Simple Interest = $\frac{P \times R \times T}{100}$

$= \frac{6800 \times 8 \times 5}{100} = 2720$

Total amount = 6800 + 2720 = 9520

Amount invested in share market

$= \frac{9520}{2} = 4760$

Remaining amount = 9520 – 4760 = 4760

Sol.171.(a) Let the principal be 100%

SI on the certain sum for $(\frac{11}{4})$yrs at the rate of 8% = $\frac{11}{4} \times 8\% = 22\%$

Here , Amount = 100% + 22% = 122%

$\rightarrow$ ₹732

Then, principal (100%) $\rightarrow \frac{732}{122} \times 100$

= ₹600

Sol.172.(b) Let the principal be 100%

SI on certain sum at 6% for $\frac{13}{2}$ yrs = $\frac{13}{2} \times 6\% = 39\%$

ATQ, 139% $\rightarrow$ ₹ 834

Then, principal (100%) $\rightarrow \frac{834}{139} \times 100$

= ₹600

Sol.173.(b)

Required SI = $\frac{2250 \times 3 \times 2}{100}$ = ₹135

Sol.174.(c) Let the principal be x

SI on certain sum at 8% for $\frac{5}{2}$ yrs

$= 8 \times \frac{5}{2} = 20\%$

120% of x = ₹ 300

Therefore x = $\frac{300}{120} \times 100$ = ₹ 250

Sol.175.(b)

Required SI = $\frac{600 \times 5 \times 8}{100} = 240$

Sol.176.(a) Let the principal be 100%

SI on certain sum at 5% for $\frac{13}{4}$ yrs

$= \frac{13}{4} \times 5\% = \frac{65}{4}\%$

Amount = 100% + $\frac{65}{4}\% = \frac{465}{4}\%$

ATQ, $\frac{465}{4}\%$ = ₹2,790

Then, 100% = $\frac{2790 \times 4}{465} \times 100$ = ₹ 2400

Sol.177.(b)

Required SI = $\frac{1250 \times 6 \times 4}{100}$= ₹300

Sol.178.(a)

Required SI = $\frac{825 \times 8 \times 5}{100}$ = ₹330

Sol.179.(c) According to question,

x × 5 × 8% = y × 6 × 7.5%

$\Rightarrow$ x × 40% = y × 45%

$\frac{x}{y} = \frac{45}{40} = \frac{9}{8}$

Sol.180.(d) According to question,

x × 5 × 9% = y × 4 × 7.5%

45x = 30y

$\frac{x}{y} = \frac{30}{45} = \frac{2}{3}$

Sol.181.(d) Let the principal be x

SI on certain sum for 1 yr 2 months($\frac{7}{6}$ yrs) at the rate of 8% = $\frac{7}{6} \times 8\% = \frac{28}{3}\%$

ATQ,

$x \times \frac{28}{300}$ = ₹491.68

Therefore, x = ₹ 5268

Sol.182.(b) Let the principal = x

According to the question,

$\frac{x \times 3 \times 8}{100} - \frac{x \times 9 \times 2}{100} = 90$

$\Rightarrow$ 6x = 9000

Now , x = ₹1500

Sol.183.(b) Given, Rate% = 8%,

Time = $3\frac{1}{2}$ years and Amount = Rs. 608

Let the principal be Rs. x

Amount = P + S.I

$\Rightarrow x + \frac{x \times 8 \times 7}{200} = 608$

$\Rightarrow x + \frac{7x}{25} = 608$

$\Rightarrow \frac{32x}{25} = 608 \Rightarrow x = 475$

Hence, the invested sum = ₹ 475

Sol.184.(c) Given, Principal = Rs.3,675, rate% = 4% and time = 2 years.

S.I = $\frac{PRT}{100} = \frac{3675 \times 2 \times 4}{100} = Rs.294$

Sol.185.(b) Given, Principal = Rs.2,000, rate% = 8.5% and time = 6 yrs.

S.I = $\frac{PRT}{100} = \frac{2000 \times 8.5 \times 6}{100} = Rs.1,020$

Sol.186.(b)

S.I for 5 years = $\frac{PRT}{100} = \frac{x \times 9 \times 5}{100}$

S.I for 8 years = $\frac{PRT}{100} = \frac{y \times 6.25 \times 8}{100}$

ATQ, $\frac{x \times 9 \times 5}{100} = \frac{y \times 6.25 \times 8}{100}$

$\Rightarrow \frac{x}{y} = \frac{8 \times 6.25}{9 \times 5} = \frac{50}{45}$ *or* $\frac{10}{9}$

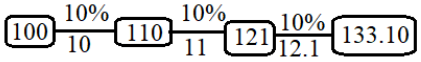
Compound Interest

Key-Points:

1. For one year or one term simple interest and compound interest are the same.

2. In simple interest you divide the simple interest by the number of years to calculate one year interest but in compound interest this is not applicable.

3. Compound Interest is the interest on amount (principal + Interest); Symbol we will use 'CI'.
Let us say one person borrows Rs.100 for 3 years at the rate of 10% annually. What amount should he have to return after 3 years?
Here is the approximation technique to solve this problem:



Compound interest will be
= 133.10 − 100 = 33.1 Rs.
The above concept can also be written as:

Amount = $\frac{100 \times 110 \times 110 \times 110}{100 \times 100 \times 100}$

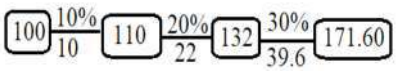
$= 133.10$; CI = Amount − Principal
= 133.10 − 100 = 33.10
Or, Amount = Principal

$(1 + \frac{r}{100})^t = 100\ (1 + \frac{10}{100})^3$

$= 100 \times \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10} = 133.10;$

CI = 33.10
So all the above concepts have the same result, but if you want to solve questions quickly and without using formulas then it is advised to develop mastery on approximation technique.
Note: Notice that in CI, interest is calculated on the amount at the end of every year while in SI interest for each year is calculated on the Principal amount.

4. If rate of interest is different for different year, let us say 10% for 1st year, 20% for 2nd year, and 30% for 3rd year then amount will be calculated as follows:



We can also do it as: Amount = $\frac{100 \times 110 \times 120 \times 130}{100 \times 100 \times 100} = 171.60\ Rs.$

Important formulas :
Amount = A
Principal = P
Compound Interest = CI
Rate of interest = R
Time = no. of cycles = n

1. CI = Amount - Principal

2. When interest is compounded annually :

A (in CI) = $P(1 + \frac{R}{100})^n$

3. When interest is compounded half-yearly :

A (in CI) = $P(1 + \frac{R/2}{100})^{2n}$

4. When interest is compounded quarterly :

A (in CI) = $P(1 + \frac{R/4}{100})^{4n}$

5. When interest is compounded monthly :

A (in CI) = $P(1 + \frac{R/12}{100})^{12n}$

6. When the interest is compounded annually and time period is given in fraction, say for $3\frac{2}{5}$ years :

A (in CI) =

$P(1 + \frac{R}{100})^3 \times (1 + \frac{\frac{2}{5}R}{100})$

7. When different interest rates for different years are given, say $R_1\%$, $R_2\%$, $R_3\%$, and $R_4\%$ for 1st, 2nd, 3rd and 4th year respectively :
A (in CI) =

$P(1 + \frac{R_1}{100})(1 + \frac{R_2}{100}) \times (1 + \frac{R_3}{100}) \times (1 + \frac{R_4}{100})$

8. Equated monthly instalment (EMI) concept :

Amount borrowed = $\frac{x}{(1 + \frac{R}{100})^n}$

where x = Instalment (EMI)
Example : Find the amount which is needed to be paid each year to clear the debt of ₹2,10,000 in 2 years at 10% interest rate.
Soln :

$210000 = \frac{x}{(1 + \frac{10}{100})^2} + \frac{x}{(1 + \frac{10}{100})}$

$210000 = \frac{x}{(\frac{11}{10})^2} + \frac{x}{(\frac{11}{10})}$

$\Rightarrow 210000 = \frac{100x}{121} + \frac{10x}{11}$

$\Rightarrow 210000 = \frac{100x + 110x}{121}$

$\Rightarrow 210000 = \frac{210x}{121} \Rightarrow x$ = ₹1,21,000

9. When the interest is compounded 8 monthly, time period is 2 years and the interest rate is 12% p.a., then
For 12 months, interest rate = 12%, so for 8 months, interest rate = $\frac{8 \times 12}{12}$ = 8%
Here, time period = 2 years = 24 months
So, $\frac{24}{8}$ = 3 , so we need to conduct 3 cycles each of interest rate 8% in order to calculate required CI.

10. Effective C.I. rate for two interest rates = (a + b + $\frac{ab}{100}$)%, where a and b are interest rates.

11. Effective C.I. rate for three interest rates = (a + b + c + $\frac{ab + bc + ca}{100}$ + $\frac{abc}{10000}$)% , where a, b and c are interest rates.

12. Effective rates :-

Years → Rate ↓	2nd	3rd	4th
5%	10.25%	15.7625%	21.550625%
10%	21%	33.1%	46.41%
20%	44%	72.8%	107.36%

Variety Questions

Q.1. If a sum of money doubles itself in 10 years at compound interest, then in how many years will it become 16 times of itself at the same rate ?
Group D 23/08/2022 (Morning)
(a) 30 (b) 20 (c) 40 (d) 10

Q.2. The compound interest paid when a sum of ₹20,000 is invested for 1 year 4 months at $7\frac{1}{2}$% compound interest per annum, compounded annually, is:
Group D 30/08/2022 (Afternoon)
(a) ₹ 2,171.25 (b) ₹2,037.50
(c) ₹2,185.75 (d) ₹2,210.40

Q.3.A certain sum amounts to ₹98,494 at the rate of 15% per annum in 2 years, interest compounded 8-monthly. What will be the amount payable (in ₹) on the same sum at the same rate and at the same time, if the interest is compounded yearly ?
Group D 05/09/2022 (Evening)
(a) 97,865 (b) 97,685
(c) 96,578 (d) 96,785

Q. 4. The amount obtained on principal

of ₹ x at 12% per annum in $2\frac{1}{2}$ years, compounded 10 - monthly , is ₹50,578. Find the value of x.
Group D 06/09/2022 (Afternoon)
(a) 38,000 (b) 40,000
(c) 42,000 (d) 36,000

Q.5. Rajani borrowed an amount of 11,550 at an interest rate of 10% per annum, compounded annually. She repaid the entire amount with interest in two equal installments, the installments being paid at the end of the first and the second years from the date of borrowing. What is the value of each installment, if interest is computed on reducing balance ?
Group D 12/09/2022 (Afternoon)
(a) ₹5,775 (b) ₹7,755
(c) ₹6,655 (d) ₹4,455

Q.6. At what rate per annum would a sum of ₹8,000 amount to ₹9,261 in $1\frac{1}{2}$ years, interest being compounded half - yearly ?
Group D 22/09/2022 (Morning)
(a) 10% (b) 15% (c) 20% (d) 5%

Q.7. A person borrows ₹20,000 at 25% compound interest per year, compounded annually. At the end of every year, he pays ₹2,500 as part payment. How much does he still owe after two such installments ?
Group D 30/09/2022 (Morning)
(a) ₹25,625 (b) ₹25,725
(c) ₹25,825 (d) ₹25,925

Q.8. If the interest earned during the 2nd year on a certain sum is ₹2,761, and the rate of interest is 10% per annum compounded annually, then the sum is :
Group D 06/10/2022 (Afternoon)
(a) ₹25,150 (b) ₹26,100
(c) ₹21,500 (d) ₹25,100

Q.9. A bank offers 7.5% compound interest per annum calculated on a half-yearly basis. A customer deposits ₹3,600 each on 1 January and 1 July of a year. At the end of the year, the amount he would have gained by way of interest is_____. [Give your answer correct to 2 decimal places.]
Group D 07/10/2022 (Afternoon)
(a) ₹405.06 (b) ₹410.06
(c) ₹272.25 (d) ₹415.06

Q.10. A sum of ₹7800 amounts to ₹10381.80 at x% p.a. In 2 years when the interest is compounded- 8monthly. What will be the compound interest on the same sum at (x + 5)% p.a. In one year, if the interest is compounded half yearly ?
NTPC CBT II Level 6 (09/05/2022) Shift 2
(a) ₹1654 (b) ₹1638 (c) ₹1660 (d) ₹1560

Q.11. Ram and Dipti each invested a sum of ₹8000 for a period of two years at 30% compound interest per annum. However, while for Ram the interest was compounded annually, for Dipti it was compounded every eight months. How much more will Dipti receive as interest compared to Ram at the end of the two year period ?
NTPC CBT II Level 4 (10/05/2022) Shift 1
(a) ₹312 (b) ₹320 (c) ₹304 (d) ₹296

Q.12. Khan lends an amount of Rs 10,000 to Irfan at 10% per annum compound interest for 5 years, compounded annually. What is the compound interest accrued for the 4^{th} year ?
NTPC CBT II Level 3 (14/06/2022) Shift 1
(a) 1762 (b) 1331 (c) 1745 (d) 1540

Q.13. A sum of Rs 22,100 was divided between Timir and Monali in such a way that if both invested their shares at 10% compound interest per annum, the amount payable on maturity to Monali after 18 years would be the same as the amount payable on maturity to Timir after 20 years. What was the share of Monali in the initial sum ?
NTPC CBT II Level 5 (15/06/2022) Shift 1
(a) 12,050 (b) 12,180
(c) 12,150 (d) 12,100

Q.14. A certain sum at compound interest amounts to ₹ 3,025 in 2 years and to ₹ 3,327.5 in 3 years, interest compounded annually. The sum and the rate of interest p.a. are respectively -
NTPC CBT II Level 3 (17/06/2022) Shift 1
(a) ₹2,800 and 9% (b) ₹2,200 and 10%
(c) ₹2,000 and 8.5% (d) ₹2,500 and 10%

Q.15. The difference between the simple interest and the compound interest on Rs.5000/- at 10% per annum for 3 years is :
NTPC CBT - I 04/01/2021 (Morning)
(a) Rs. 155 (b) Rs. 235
(c) Rs. 480 (d) Rs. 233

Q.16. A and B borrowed the same amount for the same period. A borrowed at Simple interest at the rate of 8% yearly.B borrowed on compound interest of 5% half yearly. At the end of one year, the ratio of B's interest to that of A's interest is :
NTPC CBT - I 10/01/2021 (Evening)
(a) 41 : 32 (b) 40 : 41 (c) 32 : 41 (d) 4 : 3

Q.17. A sum is invested at compound interest payable annually. The interest in two successive years was Rs 225 and Rs 236.25. Find the rate of interest ?
NTPC CBT - I 28/01/2021(Morning)
(a) 4.5% (b) 4% (c) 5% (d) 5.5%

Q.18. What will be the amount (in Rs) of annual payment that will discharge a debt of Rs 1,025 due in 2 years at the rate of 5% compound interest per annum ?
NTPC CBT - I 09/02/2021 (Morning)
(a) 551.60 (b) 551.25
(c) 549.23 (d) 550.0

Q.19. Rafique and Pritam invested identical parts of money for two years at interest rates that compound annually at 15% per annum and 10% per annum respectively. If Rafique earns Rs. 2,250 more as interest than Pritam during these two years. Then how much did of them invest annually ?
NTPC CBT - I 12/03/2021 (Evening)
(a) Rs. 18,000 (b) Rs. 20,000
(c) Rs. 20,250 (d) Rs. 22,500

Q.20. What will be the interest on the amount of Rs. 25,000 compounded annually at the rate of 4%, 5% and 6% per annum for the first, second and third year respectively ?
NTPC CBT - I 13/03/2021 (Morning)
(a) Rs. 3938 (b) Rs. 3939
(c) Rs. 3838 (d) Rs. 3839

Q.21. HDFC lends Rs. 1 million to HUDCO at 10% p.a simple interest for three years and HUDCO lends the same amount to Sahara States Housing Corporation at 10% p.a compound interest for three years. What is the earning of HUDCO in this way ?
NTPC CBT - I 23/07/2021 (Evening)
(a) Rs. 31,000 (b) Rs. 33,100
(c) Rs. 32,100 (d) Rs. 1,33,100

Q.22. Find the difference between the Simple Interest and Compound Interest on Rs.10000 for 3 years at the rate of 3% per annum.
RRB JE 02/06/2019 (Evening)
(a) Rs.27.27 (b) Rs.21.54
(c) Rs.17.82 (d) Rs.16.25

Q.23. Divide Rs.3364 between A and B so that the share of A after 5 years may be equal to the share of B after 7 years at 5% rate compounded annually. Find the share of A.
RRB JE 27/06/2019 (Morning)
(a) Rs.1564 (b) Rs.1600
(c) Rs.1764 (d) Rs.1864

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.24. In how many years will a sum of ₹10,000 become ₹13,310 at 10% compound interest per annum, compounded annually ?
Group D 18/08/2022 (Afternoon)
(a) 5 (b) 2 (c) 4 (d) 3

Q.25. A certain sum of money invested at compound interest becomes Rs 13,380 after 3 years and Rs 20,070 after 6 years, when the interest is compounded annually. Find the amount.
Group D 23/08/2022 (Evening)
(a) ₹ 8,505 (b) ₹7,020
(c) ₹8,920 (d) ₹7,007

Q.26. If the simple interest on a sum of money at 8% per annum for 2 years is ₹1,000, find the compound interest on the same sum for the same period at the same rate in case of annual compounding.
Group D 24/08/2022 (Morning)
(a) ₹1,140 (b) ₹1,260
(c) ₹1,040 (d) ₹1,060

Q.27. If 2 years ago Ravi borrowed an amount of ₹ 3,000 from Monu at 4% compound interest per annum, then what is the total amount Ravi has to pay to Monu to repay it ?
Group D 24/08/2022 (Evening)
(a) ₹3,453.90 (b) ₹2,344.80
(c) ₹4,321 (d) ₹3,244.80

Q.28. If a sum of ₹3,500 is invested at 5% compound interest per annum, compounded annually, then what is the period for which the compound interest is ₹358.75 ?
Group D 26/08/2022 (Morning)
(a) 20 months (b) 24 months
(c) 18 months (d) 15 months

Q.29. Raghu invests ₹ 5,00,000 in a scheme in the name of his 16 years old daughter, paying compound interest at 5% per annum compounded annually. What will be the total amount received when the daughter is 18 years old ?
Group D 26/08/2022 (Evening)
(a) ₹5,15,250 (b) ₹5,51,520
(c) ₹5,52,150 (d) ₹5,51,250

Q.30. If T denotes the sum of money, M denotes the number of years and P denotes the rate of interest, then the compound interest is given by:
Group D 29/08/2022 (Morning)
(a) $T(1+\frac{P}{100})^M - T$ (b) $T(1+\frac{P}{100})^M$
(c) $M(1+\frac{T}{100})^P - T$ (d) $M(1+\frac{M}{100})^M$

Q.31. Find the compound interest on ₹12,500 at 3% per annum for 3 years when interest is compounded annually (correct to nearest rupees).
Group D 29/08/2022 (Afternoon)
(a) ₹1,140 (b) ₹1,170
(c) ₹1,159 (d) ₹1,180

Q.32. Raj invested ₹14,000 at 10% p.a. for 1 year at compound interest, compounded half-yearly. The amount received by him is:
Group D 29/08/2022 (Evening)
(a) ₹15,435 (b) ₹13,542
(c) ₹14,354 (d) ₹14,765

Q.33. Arun borrowed a sum of ₹9,000 from Jayanthi at 10% rate of compound interest per annum, compounded annually. Find the total amount paid by Arun after 2 years to clear all dues.
Group D 01/09/2022 (Morning)
(a) ₹10,089 (b) ₹10,890
(c) ₹10,098 (d) ₹10,980

Q.34. A sum of ₹36,000 deposited at a certain rate of compound interest, compounded annually, becomes three times itself after 6 years. How much will it become after 18 years at the same rate of compound interest ?
Group D 01/09/2022 (Evening)
(a) ₹10,72,000 (b) ₹7,72,000
(c) ₹9,72,000 (d) ₹8,72,000

Q.35. The amount on a sum of ₹2,400 at 5% per annum compound interest, compounded annually, in 2 years will be:
Group D 05/09/2022 (Afternoon)
(a) ₹5,646 (b) ₹4,646
(c) ₹3,646 (d) ₹2,646

Q.36. If the interest is compounded half-yearly, what will a sum of ₹ 16,000 become after one year at 20% per annum compounded annually ?
Group D 06/09/2022 (Evening)
(a) ₹19,480 (b) ₹19,720
(c) ₹19,360 (d) ₹19,200

Q.37. If a certain sum becomes two times itself in 6 years at compound interest in case of annual compounding, then the number of years in which it will become eight times of itself at the same rate of interest under annual compounding is:
Group D 09/09/2022 (Morning)
(a) 18 years (b) 36 years
(c) 24 years (d) 12 years

Q.38. Suman invested a sum of ₹20,000 at 10% per annum compound interest. If she received an amount of 26,620 after n years, the value of n is :
Group D 09/09/2022 (Afternoon)
(a) 2.8 years (b) 2.5 years
(c) 3 years (d) 2 years

Q.39. If the interest on a sum of ₹ y at 4% per annum compounded annually for 2 years is ₹612, then the total amount payable at the end of the two-year period will be _____.
Group D 14/09/2022 (Afternoon)
(a) ₹8,262 (b) ₹7,812
(c) ₹8,112 (d) ₹8,002

Q.40. The difference between the compound interest (when interest is compounded annually) and the simple interest if ₹10,000 is deposited at 5% rate of interest per annum for 2 years is :
Group D 15/09/2022 (Evening)
(a) ₹25 (b) ₹15 (c) ₹50 (d) ₹35

Q.41. What will be the total amount payable on a sum of ₹12,500 after two years at the rate of 10% per annum if the interest is compounded annually ?
Group D 16/09/2022 (Morning)
(a) ₹18,500 (b) ₹17,790
(c) ₹15,125 (d) ₹25,000

Q.42. Manish deposited a certain sum of money at 5% rate of interest per annum, compounded annually At the end of 3 years. Manish received a total amount of ₹92,610. What was the sum of money deposited by Manish ?
Group D 16/09/2022 (Afternoon)
(a) ₹82,610 (b) ₹80,000
(c) ₹80,530 (d) ₹79,460

Q.43. ₹3,903 is divided between A and B, so that A's share at the end of 7 years will be equal to B's share at the end of 9 years, with interest being compounded annually at the rate of 4% per annum. The share of A is :
Group D 20/09/2022 (Morning)
(a) ₹1,828 (b) ₹1,875
(c) ₹2,028 (d) ₹2,075

Q.44. A sum is borrowed for two years at the rate of 5% compound interest per annum, compounded annually. If it is paid back in two equal annual installments of ₹882 , then the sum borrowed is :
Group D 20/09/2022 (Afternoon)
(a) ₹1,560 (b) ₹1,740
(c) ₹1,640 (d) ₹1,680

Q.45. What will ₹80,000 amount to in one year at 12% per annum, if the interest is compounded half - yearly ?
Group D 22/09/2022 (Evening)

(a) ₹88,888 (b) ₹92,450
(c) ₹1,00,352 (d) ₹89,888

Q.46. If a sum of ₹80,000 is invested for a year at 4% per annum compounded half yearly, then find the compound interest.
Group D 26/09/2022 (Afternoon)
(a) ₹3,232 (b) ₹2,525
(c) ₹5,252 (d) ₹2,323

Q.47. A sum of ₹10,000 amounts to ₹11,025 in 2 years at a certain rate of interest per annum, compounded annually. The rate of interest per annum is:
Group D 26/09/2022 (Evening)
(a) 3% (b) 6% (c) 5% (d) 4%

Q.48. What annual equal payment (in ₹) will discharge a debt of ₹28,700 due in 2 years at 5% p.a., interest compounded annually ?
Group D 29/09/2022 (Morning)
(a) 15,534 (b) 15,435
(c) 15,543 (d) 15,345

Q.49. The total amount payable at maturity on a certain sum invested at simple interest at 8% p.a. for $3\frac{1}{2}$ years exceeds the simple interest payable on the same sum at 10.5% p.a.for 12 years by ₹156. The sum (in ₹) is:
Group D 30/09/2022 (Evening)
(a) 7,800 (b) 8,000 (c) 7,500 (d) 8,200

Q.50. A sum of money triples itself at a certain rate of compound interest in 10 years. In how many years will it amount to 9 times of itself ?
Group D 06/10/2022 (Morning)
(a) 15 years (b) 20 years
(c) 30 years (d) 25 years

Q.51. A trader owes a merchant ₹12,500 due in one year. However, the trader wants to settle the amount after 6 months. If the rate of interest is 8% per annum, then how much money should he pay ? (Give your answer correct to the nearest whole number value.)
Group D 06/10/2022 (Afternoon)
(a) ₹12,091 (b) ₹10,291
(c) ₹10,219 (d) ₹12,019

Q.52. The difference between the compound interest and the simple interest, compounded annually, on a certain sum of money for 4 years at 8% per annum is ₹20. Find the sum. [Give your answer correct to 2 decimal places.]
Group D 06/10/2022 (Evening)
(a) ₹473.83 (b) ₹463.83
(c) ₹493.96 (d) ₹483.83

RRB NTPC CBT - 2
(09/05/2022 to 17/06/2022)

Q.53. A certain sum on compound interest becomes ₹56,180 when compounded annually after 2 years and ₹59,550.80 after 3 years. Find the sum (in ₹).
Level 6 (09/05/2022) Shift 1
(a) 48,700 (b) 50,000
(c) 52,500 (d) 45,000

Q.54. The difference between the interest payable on a sum invested for three years at 20% compound interest per annum compounded annually and 20% simple interest per annum for the same period is ₹448. What is the value of the sum invested ?
Level 6 (09/05/2022) Shift 1
(a) ₹3,750 (b) ₹4,000
(c) ₹3,500 (d) ₹3,000

Q.55. A sum of Rs 98,00 was invested for a year at 10% interest per annum, compounded half - yearly. What would been the interest payable at the end of the year ?
Level 5 (12/06/2022) Shift 1
(a) 1,003.50 (b) 1,004.50
(c) 1,005.60 (d) 980

Q.56. A sum of money at certain rate of interest when compounded annually becomes Rs 625 in 3 years and Rs 675 in 4 year. What is the rate of interest per annum ?
Level 5 (12/06/2022) Shift 1
(a) 8% (b) 4% (c) 7% (d) 6%

Q.57. Rahul invested a certain sum for two years at 60% p.a. compound interest, compounded annually. If at the end of two years he received interest of ₹ 11,700, then how much did he initially invest ?
Level 5 (12/06/2022) Shift 2
(a) ₹ 7,750 (b) ₹ 8,000
(c) ₹ 7,500 (d) ₹ 7,250

Q.58. A certain sum was invested at 40% p.a. compound interest for two years and the interest was compounded annually. If the interest was compounded half yearly, the amount payable on maturity after two years would have been ₹4,544 more. What was the sum invested ?
Level 5 (12/06/2022) Shift 2
(a) ₹37,500 (b) ₹42,000
(c) ₹42,500 (d) ₹40,000

Q.59. If interest is compounded annually at 10% per annum , then what would be the total amount payable on maturity when a sum of Rs 5700 is invested for a period of two years ?
Level 2 (13/06/2022) Shift 1
(a) 6887 (b) 6897 (c) 6997 (d) 6987

Q.60. A sum of ₹400 lent at compound interest amounts to ₹484 in 2 years, interest compounded yearly. What is the rate of interest p.a ?
Level 3 (14/06/2022) Shift 2
(a) 10% (b) 16% (c) 11% (d) 12%

Q.61. Kiran lent ₹40,000 to Kishore on compound interest for 2 years, compounded annually. The rate of interest is 20%. What is the Compound interest that Kiran will receive after 2 years ?
Level 3 (14/06/2022) Shift 2
(a) ₹12,350 (b) ₹17,600
(c) ₹14,560 (d) ₹16,780

Q.62. A sum of money invested at a certain rate of compound interest per annum amounts to Rs 96,800 in 2 years and to Rs 1,06,480 in 3 years. Find the rate of compound interest per annum.
Level 5 (15/06/2022) Shift 1
(a) 10.5% (b) 10% (c) 12% (d) 11%

Q.63. On compound interest, a certain sum becomes ₹19,360 after 2 years and ₹21,296 after 3 years. Find the simple interest on the same sum at the same rate of interest for 3 years.
Level 5 (15/06/2022) Shift 2
(a) ₹4,760 (b) ₹4,675
(c) ₹4,725 (d) ₹4,800

Q.64. A sum of ₹10,000 was invested on compound interest in two parts. One part at 10% p.a. and the other at 20% p.a. compounded yearly for two years. If the total amount received on maturity after two years was ₹12,928, then find the sum that was invested at 10% compound interest p.a .
Level 5 (15/06/2022) Shift 3
(a) 7200 (b) 6000 (c) 6400 (d) 6500

Q.65. The difference between the compound interest and the simple interest earned on a certain sum of money in two years at 9% interest per annum is Rs 97.2. Find the sum invested ?
Level 5 (15/06/2022) Shift 3
(a) 10000 (b) 15000 (c) 12500 (d) 12000

Q.66. Find the compound interest on ₹100000 at 20% per annum for 3 years 3 months, compounded annually.
Level 2 (16/06/2022) Shift 1
(a) ₹82360 (b) ₹81440
(c) ₹65000 (d) ₹71650

Q.67. What is the compound interest (in Rs) on a sum ₹31,600 for $1\frac{1}{3}$ years at 9% p.a. , when the interest is compounded 8-monthly ?(Nearest to a ₹)
Level 2 (16/06/2022) Shift 2
(a) 3906 (b) 3896 (c) 3928 (d) 3916

Q.68. A part of Rs 55,800 was invested in scheme A for 2 years at 20% per annum compound interest , compounded annually, and the rest of the money was invested in Scheme B at 20% per annum simple interest for 4 years. Both the schemes earned equal interests. How much was invested in Scheme A ?
Level 2 (16/06/2022) Shift 2
(a) 36000 (b) 28300 (c) 40100 (d) 32400

Q.69. If ₹5000 is invested for a period of three years at 20% compound interest per annum, compounded annually, what will be the amount received after 3 years ?
Level 2 (16/06/2022) Shift 3
(a) 8640 (b) 8000 (c) 8680 (d) 8480

Q.70. What would be the interest payable on a sum of ₹ 15,000 after 2 years if the interest is compounded yearly at 2% per annum ?
Level 3 (17/06/2022) Shift 1
(a) ₹ 606 (b) ₹ 604 (c) ₹ 600 (d) ₹ 608

Q.71. A sum of money invested at 10% compound interest per annum amounts to ₹10,164 in 2 years interest compounded annually. What was the sum invested ?
Level 3 (17/06/2022) Shift 2
(a) ₹8,800 (b) ₹8,200
(c) ₹8,300 (d) ₹ 8,400

Q.72. If the rate of interest is 20% per annum and interest is compounded half yeary, then in $\frac{3}{2}$ years a sum of ₹ 4000 will amount to:
Level 3 (17/06/2022) Shift 3
(a) ₹ 5224 (b) ₹ 5234
(c) ₹ 5324 (d) ₹ 5334

Q.73. A sum of ₹ 14000 amounts to ₹ 18515 in 2 years at a certain rate percent p.a. Interest compounded yearly. What will be the compound interest on the same sum , in the same time and at the same rate, if the interest is compounded 8 -monthly ?
Level 3 (17/06/2022) Shift 3
(a) ₹ 4494 (b) ₹ 4620
(c) ₹ 4634 (d) ₹ 3234

RRB NTPC CBT - 1
(28/12/2020 to 31/07/2021)

Q.74. The simple interest on a sum of amount for 2 years at 10% per annum is Rs.500. The compound interest on the same sum at the same rate for the same time is :
RRB NTPC 28/12/2020 (Morning)
(a) Rs. 515 (b) Rs. 525
(c) Rs. 510 (d) Rs. 520

Q.75. A sum of money amounts to Rs.12,100 in 2 years and Rs.13,310 in 3 years, when compounded annually. Find the rate of interest.
RRB NTPC 29/12/2020 (Morning)
(a) 9% (b) 12% (c) 8% (d) 10%

Q.76. A sum of money amounts to Rs.1600 in two years and Rs.1700 in three years, at compounded interest, compounded annually. What is the rate of interest ?
RRB NTPC 30/12/2020 (Morning)
(a) 6% (b) 7% (c) 6.25% (d) 6.5%

Q.77. Find the rate of interest for a sum that becomes $\frac{14641}{10000}$ times of itself in 4 years compounded annually.
RRB NTPC 04/01/2021 (Evening)
(a) 15% (b) 12% (c) 20% (d) 10%

Q.78. A sum of Rs.12,000.00 deposited at compound interest becomes double at the end of 5 years. At the end of 15 years the sum will be :
RRB NTPC 07/01/2021 (Morning)
(a) Rs. 1,08,000.00 (b) Rs. 1,20,000.00
(c) Rs. 84,000.00 (d) Rs. 96,000.00

Q.79. The difference between the compound interest compounded annually and the simple interest on a certain sum of money for 2 years at 4% per annum is Rs. 20.00. The sum is :
RRB NTPC 07/01/2021 (Morning)
(a) Rs.11,500.00 (b) Rs. 8,500.00
(c) Rs. 12,500.00 (d) Rs. 10,500.00

Q.80. A sum of money becomes Rs. 10648 after 3 years and Rs. 9680 after 2 years of compound interest computed yearly. What is the rate of interest ?
RRB NTPC 08/01/2021 (Morning)
(a) 12% (b) 8% (c) 9% (d) 10%

Q.81. The compound interest on a certain sum of money at the rate of 11% per annum for 2 years is Rs 4,642. Find its simple interest at the same rate and for the same period.
RRB NTPC 08/01/2021 (Evening)
(a) Rs.4400 (b) Rs.3500
(c) Rs.4200 (d) Rs.4500

Q.82. Zaved borrowed Rs 10,000 for 2 years on compound interest, compounded annually and paid Rs. 12,544 at the end of 2 years. If he had borrowed the amount on simple interest, then how much money he would have saved ?
RRB NTPC 09/01/2021 (Morning)
(a) Rs. 144 (b) Rs. 12,400
(c) Rs. 4,944 (d) Rs. 2,400

Q.83. Rajpal borrowed a certain amount at 10% per annum simple interest for $1\frac{1}{2}$ years. He gave the same amount as a loan to a friend and charged compound interest (compounded semi-annually) at the same rate for the same period. In this way he earned Rs. 305. Find the sum of the money.
RRB NTPC 09/01/2021 (Evening)
(a) Rs 40,305 (b) Rs 40,000
(c) Rs 30,500 (d) Rs 30,000

Q.84. Kumud borrowed some amount at simple interest of 10% per annum for $1\frac{1}{2}$ year. Sneha borrowed the same amount at the same rate on compound interest (compounded semiannually) for the same period. If Sneha paid Rs.61 more than Kumud as interest, then how much money did each of them borrow ?
RRB NTPC 11/01/2021 (Evening)
(a) Rs.$\frac{61}{80}$ (b) Rs. $\frac{1261}{80}$
(c) Rs. 4,000 (d) Rs. 8,000

Q.85. There is 60% increase in an amount in 6 years at simple interest. What will be the compound interest of Rs 10,000 after 3 years at the same rate ?
RRB NTPC 12/01/2021 (Evening)
(a) Rs 13,310 (b) Rs 13,500
(c) Rs 3,500 (d) Rs 3310

Q.86. Calculate the compound interest on Rs. 15,000 in one year at 4% per annum, if the interest is compounded half yearly.
RRB NTPC 16/01/2021 (Morning)
(a) Rs. 600 (b) Rs. 606
(c) Rs. 5606 (d) Rs. 6060

Q.87. The difference between compound interest and simple interest, at the same rate, on an amount of Rs. 15000 for 2 years is Rs. 24. What is the rate of interest per annum ?
RRB NTPC 17/01/2021 (Morning)
(a) 6% (b) 10% (c) 4% (d) 8%

Q.88. The rate of compound interest p.a. at which a sum of Rs.1,200 will become Rs.1,348.32 in 2 years is:

RRB NTPC 21/01/2021 (Evening)
(a) 6% (b) 7% (c) 8% (d) 5%

Q.89. The production in a factory increased from 6600 tons to 7986 tons in 2 years. Find the rate of increase if compounded annually.
RRB NTPC 25/01/2021 (Morning)
(a) 8% (b) 12% (c) 14% (d) 10%

Q.90. A man deposits Rs16,000 on fixed deposit terms of 2 years at 10% compounding interest. If the interest is payable half yearly, how much amount (in Rs) would be receive on maturity ?
RRB NTPC 25/01/2021 (Evening)
(a) 19,445.1 (b) 19,447.1
(c) 19,446.1 (d) 19,448.1

Q.91. Find the compound interest on a sum Rs.25,000, for three years, if the rate of interest is 4% p.a. for the first year, 5% p.a. For the second year and 6% p.a. for the third year.
RRB NTPC 27/01/2021 (Evening)
(a) Rs.5,938 (b) Rs.3,938
(c) Rs.6,038 (d) Rs.4,938

Q.92. Simple interest on a sum of money, at 5% per annum for 2 years , is Rs. 50 . The compound interest on the same sum for the same period at the same interest rate is :
RRB NTPC 28/01/2021 (Evening)
(a) Rs. 51.40 (b) Rs. 51.25
(c) Rs. 51.35 (d) Rs. 51.30

Q.93. Find the interest (in Rs) on Rs 8,000 at 10% per annum compounded half yearly for $1\frac{1}{2}$years.
RRB NTPC 30/01/2021 (Morning)
(a) 1,260 (b) 1,261 (c) 1,263 (d) 1,264

Q.94. Rs.100 was invested @ 10% compound interest per year for two years. If the rate of interest was increased to 20% for the same period. How many more rupees would the investor get as interest ?
RRB NTPC 31/01/2021 (Morning)
(a) Rs.23/- (b) Rs.20/-
(c) Rs.24/- (d) Rs.22/-

Q.95. A deposited Rs.8,000 in a bank at 8% per annum simple interest. B deposited Rs.6,000 at 10% compound interest per annum. After 3 years the difference between their interest will be :
RRB NTPC 01/02/2021 (Morning)
(a) Rs.66 (b) Rs.88 (c) Rs.78 (d) Rs.68

Q.96. The difference between the compound interest and the simple interest accrued at the same rate of interest on an amount of Rs 16,000 in 2 years was Rs. 1,000. What was the rate of interest percent per annum ?
RRB NTPC 02/02/2021 (Morning)
(a) 50% (b) 25% (c) 10% (d) 12%

Q.97. The difference between the compound interest and the simple interest on a principal of Rs. 24,000 in 2 years at same rate of interest is Rs. 60. The rate of interest is :
RRB NTPC 04/02/2021 (Morning)
(a) 7% (b) 6% (c) 8% (d) 5%

Q.98. A sum of money becomes Rs. 6,400 in 2 years and Rs.8,100 in 4 years on compound interest. Find the rate of compound interest.
RRB NTPC 04/02/2021 (Morning)
(a) 14.5% (b) 10.5% (c) 12.5% (d) 16.5%

Q.99. A sum of money becomes 8 times of itself in 3 years at compound interest compounded annually. The rate of interest is : _____.
RRB NTPC 05/02/2021 (Morning)
(a)100% (b) Data inadequate
(c) 8% (d) 5%

Q.100. A sum of money was lent on compound interest. It becomes Rs 500 at the end of the first year and Rs 550 at the end of second year. Find the rate of compound interest per annum.
RRB NTPC 08/02/2021 (Morning)
(a) 20% (b) 5% (c) 15% (d) 10%

Q.101. What is the difference between the compound interests on a sum of Rs. 5,000 for $1\frac{1}{2}$ years at 4% per annum compounded yearly and half - yearly ?
RRB NTPC 10/02/2021 (Evening)
(a) Rs.3.40 (b) Rs.2.90
(c) Rs.3.61 (d) Rs.2.04

Q.102. If an investment of Rs. 1000 amounts to Rs. 1440 in 2 years when compounded annually, then what is the rate of compound interest ?
RRB NTPC 11/02/2021 (Morning)
(a) 30% (b) 20% (c) 0.2% (d) 40%

Q.103. A man invests Rs. 5,000 for three years at a certain rate of interest, compounded annually. At the end of the first year. It amounts to Rs. 5,600. Calculate the rate of interest per annum.
RRB NTPC 12/02/2021 (Morning)
(a) 13% (b) 14% (c) 12% (d) 11%

Q.104. A sum was invested for 3 years on compound interest at 6% , 12% and 18% in first, second and third year respectively. The sum amounts to Rs. 20,000 in 3 years. Find the principal amount.
RRB NTPC 15/02/2021 (Morning)
(a) Rs. 10,276.43 (b) Rs. 14,276.58
(c) Rs. 13,572.46 (d) Rs. 12,276.12

Q.105. Find the total amount (in Rs.) of Rs.4,500 at 12% per annum for 2 years and 8 months compounded annually.
RRB NTPC 16/02/2021 (Evening)
(a) Rs.6,069.38 (b) Rs.6,096.38
(c) Rs.6,095.95 (d) Rs.6,097.28

Q.106. The compound interest on a sum of Rs7,500 for 2 years at 4% p.a. is
RRB NTPC 17/02/2021 (Morning)
(a) Rs.515 (b) Rs.750
(c) Rs.850 (d) Rs.612

Q.107. The present worth of Rs. 338 due in 2 years at 4% per annum compound interest is...
RRB NTPC 22/02/2021 (Morning)
(a) Rs. 312.50 (b) Rs. 294.00
(c) Rs. 365.58 (d) Rs. 350.50

Q.108. If the compound interest on a certain sum of money for 3 years at 5% per annum is Rs.3783, then what would be the simple interest on the same sum of money for the same period and at the same rate ?
RRB NTPC 27/02/2021 (Morning)
(a) Rs. 3,600 (b) Rs. 3,400
(c) Rs. 3,440 (d) Rs. 3,680

Q.109. Rs. 200 was invested for 2 years on 10% compound interest per year. If the rate of interest had been 20% then how much more would the investor have received as interest for the same period ?
RRB NTPC 27/02/2021 (Morning)
(a) Rs. 46 (b) Rs. 40 (c) Rs. 44 (d) Rs. 48

Q.110. The compound interest on a sum of money at 5% per annum for 3 years is Rs. 6,305/-. Find the simple interest (in Rs.) for the same sum at the same rate of interest for the same number of years.
RRB NTPC 02/03/2021 (Morning)
(a) 6,000/- (b) 4,000/-
(c) 3,600/- (d) 5,000/-

Q.111. At what annual rate of compound interest, compounded semi-annually, will Rs.57,600 become Rs.72,900 in one year ?
RRB NTPC 03/03/2021 (Evening)
(a) 6.25% per annum
(b) 12.5% per annum
(c) 50% per annum
(d) 25% per annum

Q.112. A sum of money doubles itself at compound interest in 12 years.In how many years will it become 4 times ?

RRB NTPC 04/03/2021 (Morning)
(a) 36 (b) 20 (c) 18 (d) 24

Q.113. Find the compound interest on Rs. 20,000/- in 2 years at 8% per annum. If interest is compounded yearly.
RRB NTPC 04/03/2021 (Evening)
(a) Rs 3,328.00 (b) Rs 3,109.78
(c) Rs 3,220.00 (d) Rs 3,200.00

Q.114. What is the principal amount which earns Rs. 154/- as a compound interest for the second year at 10% per annum ?
RRB NTPC 04/03/2021 (Evening)
(a) Rs 2,750.50 (b) Rs 1,540.00
(c) Rs 1,200.00 (d) Rs 1,400.00

Q.115. The compound interest on Rs. 20000 in 2 years at a 4% per year, the interest being compounded half - yearly , will be:
RRB NTPC 08/03/2021 (Morning)
(a) Rs. 1648.64 (b) Rs. 1500
(c) Rs. 1700 (d) Rs. 1842.64

Q.116. The difference between the compound interest and the simple interest on a certain amount at a rate of interest of 5% per annum for 2 years is Rs. 25. Find the amount.
RRB NTPC 08/03/2021 (Morning)
(a) Rs. 10000 (b) Rs. 8500
(c) Rs. 9000 (d) Rs. 7500

Q.117. In how many years will a sum of Rs.4,000 be increased to Re. 4,840 at 10% compound interest per annum ?
RRB NTPC 08/03/2021 (Morning)
(a) 2 (b) 6 (c) 4 (d) 1

Q.118. Ramu borrows Rs. 64,000 at 25% per annum compound interest. At the end of every year he pays Rs. 3,200 as part of repayment. How much does he still owe after 3 such instalments ?
RRB NTPC 08/03/2021 (Evening)
(a) Rs. 1,12,800 (b) Rs. 12,500
(c) Rs. 1,12,500 (d) Rs. 12,800

Q.119. Mahesh invested an amount of Rs. 8000 in a fixed deposit scheme for 2 years at compound interest 5 p.c.p.a. How much amount will Mahesh get on maturity of the fixed deposit ?
RRB NTPC 11/03/2021 (Morning)
(a) Rs. 8800 (b) Rs. 8820
(c) Rs. 8720 (d) Rs. 8900

Q.120. A man borrows Rs. 2,460 to be paid back with compound interest at the rate of 5% p.a. By the end of 2 years, in equal installments. How much will each installment be ?
RRB NTPC 11/03/2021 (Evening)
(a) Rs. 1,275 (b) Rs. 1,283
(c) Rs. 1,377 (d) Rs. 1,323

Q.121. At what rate of compound interest per annum will a sum of Rs. 1,500 become Rs. 1,591.35 in 2 years ?
RRB NTPC 13/03/2021 (Evening)
(a) 3% (b) 2% (c) 4% (d) 5%

Q.122. Divide Rs. 20,609 between A and B, such that the amount (in Rs.) of A after 7 years is equal to the amount (in Rs.) of B after 9 years, if the interest being compounded yearly at 3 % per annum.
RRB NTPC 15/03/2021 (Morning)
(a) A = Rs. 10,609 , B = Rs. 10,000
(b) A = Rs. 10,601 , B = Rs. 10,000
(c) A = Rs. 10,605 , B = Rs. 10,100
(d) A = Rs. 10,509 , B = Rs. 10,004

Q.123. Sunil and Kamal took loan of Rs. 40,000 each for 1 year 6 months from a moneylender who charged simple interest from Sunil @ 11% per annum and compound interest from Kamal @ 10% per annum compounded semi-annually. Who paid more interest and by what amount ?
RRB NTPC 15/03/2021 (Evening)
(a) Kamal paid Rs. 195 more
(b) Sunil paid Rs. 295 more
(c) They paid equal interest
(d) Kamal paid Rs. 305 more

Q.124. Rs. 4,800 becomes Rs. 6,000 in 4 years at a certain rate of compound interest. What will be the amount after 12 years at the same rate of compound interest ?
RRB NTPC 21/03/2021 (Evening)
(a) Rs. 12,000 (b) Rs. 8,400
(c) Rs. 9,600 (d) Rs. 9,375

Q.125. The value of a car depreciates at the rate of 12% per annum. Its present value is Rs. 7,74,400. What was the value of the car 2 years ago ?
RRB NTPC 27/03/2021 (Evening)
(a) Rs. 9,99,999 (b) Rs. 11,00,000
(c) Rs. 9,00,000 (d) Rs. 10,00,000

Q.126. A sum of money invested at a certain rate of interest compounded annually amounts to Rs.729 in 4 years and Rs.1,331 in 7 years. Find the annual rate of interest.
RRB NTPC 01/04/2021 (Evening)
(a) $17\frac{2}{7}$% (b) $23\frac{2}{9}$% (c) $22\frac{2}{9}$% (d) 20%

Q.127. The compound interest on Rs.5,000 for 2 years is Rs.253.125. What would be the interest if the same sum is invested for the same duration at the same rate of simple interest ?
RRB NTPC 01/04/2021 (Evening)
(a) Rs.250 (b) Rs.255
(c) Rs.248 (d) Rs.240

Q.128. At what rate percent year compound interest does a sum of money becomes $\frac{9}{4}$ times of itself in 2 years ?
RRB NTPC 03/04/2021 (Evening)
(a) 50% (b) 35% (c) 60% (d) 40%

Q.129. The difference between the compound and the simple interests on a certain sum of money for two years, at 5% per annum, is Rs. 1. The Sum is :
RRB NTPC 05/04/2021 (Morning)
(a) Rs. 450 (b) Rs. 550
(c) Rs. 400 (d) Rs. 500

Q.130. On what sum will the compound interest, at the rate of $12\frac{1}{2}$% per annum for 2 years compounded annually , be Rs.6,800 ?
RRB NTPC 06/04/2021 (Evening)
(a) Rs. 27,200 (b) Rs. 27,260
(c) Rs. 25,600 (d) Rs.54,400

Q.131. A sum of Rs. 400 would become Rs. 441 after 2 years at r% p.a. Compound interest.Find the value of r.
RRB NTPC 07/04/2021 (Morning)
(a) 6% (b) 5% (c) 7% (d) 8%

Q.132. Find the sum for which the difference in the compound interest compounded annually and the simple interest for 3 years at 5% p.a. is Rs. 244.
RRB NTPC 08/04/2021 (Evening)
(a) Rs. 32,000 (b) Rs. 31,500
(c) Rs. 35,000 (d) Rs. 32,250

Q.133. Find the compound interest on Rs 5,000 at a rate of 6% per annum for 3 years, compounded annually [correct to the nearest integer] .
RRB NTPC 23/07/2021 (Morning)
(a) Rs. 955 (b) Rs. 618
(c) Rs. 900 (d) Rs. 956

Q.134. The difference between simple interest and compound interest on Rs. 1,00,000 for 18 months at 12% annum reckoned half yearly is:
RRB NTPC 24/07/2021 (Evening)
(a) Rs. 11,016 (b) Rs. 110.16
(c) Rs. 1101.6 (d) Rs. 1.11016

Q.135. At what rate of compound interest per annum will a sum of Rs. 1,250 become Rs, 1,488.77 in 3 years ?
RRB NTPC 26/07/2021 (Evening)
(a) 6.5% (b) 7% (c) 7.5% (d) 6%

Q.136. The least number of years in which a sum of money invested at 20% compound interest will become more than its double is :
RRB NTPC 31/07/2021 (Morning)
(a) 6 (b) 3 (c) 4 (d) 5

RRB JE
(22/05/2019 to 28/06/2019)

Q.137. Find the Compound Interest on a sum of Rs.1000 at the rate of 10% per annum for 1.5 years when interest is compounded half - yearly.
RRB JE 22/05/2019 (Afternoon)
(a) Rs.160.55 (b) Rs.167.36
(c) Rs.150.25 (d) Rs.157.63

Q.138. The difference between Compound Interest and Simple Interest on a certain sum for 2 years at 12.5% rate is Rs.45. What is the sum?
RRB JE 22/05/2019 (Afternoon)
(a) Rs 2440 (b) Rs 2000
(c) Rs 2880 (d) Rs 3000

Q.139. On a certain sum of money, the Compound Interest for 2 years is Rs.309 and the Simple Interest is Rs.300. Find the rate of interest per annum.
RRB JE 22/05/2019 (Evening)
(a) 6% (b) 8% (c) 9% (d) 7%

Q.140. On what principal will the difference between Compound Interest and Simple Interest at 10% rate in 3 years be equal to Rs.620 ?
RRB JE 24/05/2019 (Evening)
(a) Rs.24000 (b) Rs.25000
(c) Rs.20000 (d) Rs.18000

Q.141. A sum of Rs.16400 is borrowed to be paid back in 2 years by equal payments allowing 5% Compound Interest. Find the annual payment.
RRB JE 25/05/2019 (Afternoon)
(a) Rs.7600 (b) Rs.7495
(c) Rs.7590 (d) Rs.8820

Q.142. A certain sum of money invested at Compound Interest, compounded annually, amounts to Rs.338 at the rate of 4% per annum for 2 years. Find the sum.
RRB JE 25/05/2019 (Evening)
(a) Rs.315 (b) Rs.312.50
(c) Rs.320 (d) Rs.318.52

Q.143. A sum of Rs.1100 was taken as a loan. This is to be paid in two equal installments. If the rate of interest is 20% per annum, compounded annually, find the amount payable in each Installment.
RRB JE 25/05/2019 (Evening)
(a) Rs.620 (b) Rs.720
(c) Rs.670 (d) Rs.600

Q.144. A sum of money at 8% Simple Interest was placed in a deposit for 7 years. The matured amount was then invested in a scheme offering 10% Compound Interest compounded annually, thereby procuring an interest of Rs.1638 in 2 years. What was the original sum ?
RRB JE 27/05/2019 (Morning)
(a) Rs.6200 (b) Rs.5000
(c) Rs.7500 (d) Rs.8000

Q.145. A sum increases by 100% in 8 years at a certain rate of Simple Interest. What will be the Compound Interest of Rs.8000 after 2 years at the same rate of interest ?
RRB JE 29/05/2019 (Evening)
(a) Rs 2050 (b) Rs 2075
(c) Rs 2125 (d) Rs 2025

Q.146. What is the Simple Interest on a sum of money at 12.5% for 2 years if the Compound Interest on the same sum and same period, same rate of interest is Rs.510 ?
RRB JE 30/05/2019 (Evening)
(a) Rs.480 (b) Rs.500
(c) Rs.408 (d) Rs.420

Q.147. If the Simple Interest on a sum of money at 5% for 3 years is Rs. 1200, what will be the Compound Interest for the same period and rate for the same sum?
RRB JE 01/06/2019 (Afternoon)
(a) Rs. 1561 (b) Rs. 1461
(c) Rs. 9261 (d) Rs. 1261

Q.148. The difference between Compound Interest and Simple Interest in 2 years on a certain sum is Rs.8 at 8% rate. What is the sum?
RRB JE 02/06/2019 (Morning)
(a) Rs.2000 (b) Rs.1250
(c) Rs.1500 (d) Rs.1000

Q.149. Compound Interest and Simple Interest on a certain sum of money for 2 years is Rs.282.15 and Rs.270 respectively. The rate of interest is:
RRB JE 02/06/2019 (Evening)
(a) $6\frac{2}{3}\%$ (b) $8\frac{1}{3}\%$ (c) 9% (d) 11%

Q.150. A sum of money is put on Compound Interest for 2 years at 20%. It would fetch Rs.482 more if the interest is payable half yearly than if it were payable yearly. Find the sum.
RRB JE 26/06/2019 (Morning)
(a) Rs.19500 (b) Rs.20000
(c) Rs.21800 (d) Rs.30000

Q.151. In what time will Rs.1000 become Rs.1331 at 10% per annum compounded annually ?
RRB JE 27/06/2019 (Morning)
(a) 4 years (b) 3 years
(c) 2 years (d) 5 years

Q.152. The Simple Interest on Rs. 'x' for 3 years at 8% equals half the Compound Interest on Rs.4000 at 10% for 2 years. Find 'x'.
RRB JE 28/06/2019 (Evening)
(a) Rs.1750 (b) Rs.6000
(c) Rs.1520 (d) Rs.1400

RRB ALP Tier - 2
(21/01/2019 to 08/02/2019)

Q.153. For a certain amount, compound interest for 2nd year is Rs. 800 and Rs 840 for 3rd year . The rate of interest is :
ALP Tier II 21/01/2019 (Evening)
(a) 6% (b) 5% (c) 7% (d) 4%

Q.154. An amount of ₹ 10000 is deposited in a bank which offers compound interest at 20% per annum. How much will be in the bank after 2 years ?
ALP Tier II 21/01/2019 (Evening)
(a) ₹12000 (b) ₹13600
(c) ₹14400 (d) ₹8000

Q.155. The amount received at compound interest on a certain principal at the end of first and second year is ₹ 1,350 and ₹ 1,458 respectively, then what is the rate of interest ?
ALP Tier II 23/01/2019 (Morning)
(a) 12% (b) 8% (c) 15% (d) 10%

Q.156. If the compound interest received on a certain sum in the first year is ₹ 1,440, then what will be the compound interest on the same principal for the second year at 10% interest ?
ALP Tier II 23/01/2019 (Afternoon)
(a) ₹1,584 (b) ₹1,554
(c) ₹1,512 (d) ₹1,540

RPF Constable
(17/01/2019 to 19/02/2019)

Q.157. With an annual compound interest rate of 15% per annum (in rupees), the amount received After a period of 2 years on a sum of 18000 rupees is :-
RPF Constable 17/01/2019 (Morning)
(a) 24805 (b) 23805 (c) 25805 (d) 22805

Q.158. The difference between Compound Interest and Simple Interest on a certain sum after two years at 10% p.a. is Rs.462. Find the sum of money invested.
RPF Constable 18/01/2019 (Morning)
(a) Rs.42,600 (b) Rs.26,400
(c) Rs.24,600 (d) Rs.46,200

Q.159. Find the amount ,when a sum of 32000 rupees is invested at the rate of 15% per annum compounded annually for a period of 2 years .
RPF Constable 18/01/2019 (Afternoon)
(a) 43320 (b) 45320(c) 44320 (d) 42320

Q.160. The difference between the compound interest and the simple interest on a certain sum at the rate of 10% per annum after 2 years is Rs.523. Find the amount invested.
RPF Constable 19/01/2019 (Morning)
(a) Rupee. 52300 (b) Rupee. 42300
(c) Rupee. 62300 (d) Rupee. 72300

Q.161. If the principal is Rs.26000 Find the total amount at compound interest rate after 3 years at the rate of 10% per year. (In Rupees)
RPF Constable 19/01/2019 (Morning)
(a) 35606 (b) 34606 (c) 37606 (d) 36606

RPF S.I.
(19/12/2018 to 16/01/2019)

Q.162. The difference between the compound interest and the simple interest on the same sum of money invested at the same rate for 2 years is ₹32. If the rate of interest is 4% per annum, then calculate the amount invested (in ₹) ?
RPF S.I. 19/12/2018 (Morning)
(a) 30000 (b) 16000 (c) 20000 (d) 25000

Q.163. The difference between the amount of interest received on the same amount invested at compound interest and simple interest at the same rate of interest for two years is ₹ 36. If the rate of interest is 4% per annum, then calculate the amount invested (in ₹)?
RPF S.I. 19/12/2018 (Evening)
(a) 20500 (b) 23850 (c) 16750 (d) 22500

Q.164. The difference between the amounts of compound interest and simple interest received on the same sum in two years is ₹40. If the rate of interest is 4% per annum, then calculate the amount invested (in ₹).
RPF S.I. 24/12/2018 (Morning)
(a) 32000 (b) 20000 (c) 22500 (d) 25000

Q.165. A sum of money at compound interest becomes twice the principal amount in 3 years. In how many years will it become 64 times of its original amount ?
RPF S.I. 24/12/2018 (Morning)
(a) 16 (b) 20 (c) 14 (d) 18

Q.166. The difference between earned interest on the same amount invested for 2 years on compound interest and simple interest is Rs. 76. If interest rates are 4% per year, then calculate the amount invested. (In rupees)
RPF S.I. 05/01/2019 (Morning)
(a) 51,500 (b) 47,500
(c) 48,500 (d) 49,500

Q.167. A sum of money at compound interest becomes three times the principal amount in 4 years. In how many years will it become 9 times the original amount ?
RPF S.I. 06/01/2019 (Afternoon)
(a)10 (b) 9 (c) 7 (d) 8

Q.168. The difference between the amounts of compound interest and simple interest received in two years on the same amount at the same rate of interest is Rs 60, if the rate of interest is 4% per annum, calculate the amount invested. (in Rs.)
RPF S.I. 10/01/2019 (Morning)
(a) 35,500 (b) 36,500
(c) 34,500 (d) 37,500

RRB ALP Tier - 1
(09/08/2018 to 31/08/2018)

Q.169. Simple interest on a certain sum of money for 3 years at 5% per annum is ₹5250. What will be the compound interest on that sum at the same rate for the same period ?
RRB ALP 10/08/2018 (Afternoon)
(a) ₹5,517.88 (b) ₹5,510.88
(c) ₹5,512.88 (d) ₹5,516.88

Q.170. If sum of ₹ 1000 amount to ₹ 1331 in 3 years, compounded annually. Then, find the rate of interest per annum?
RRB ALP 13/08/2018 (Afternoon)
(a) 15% (b) 20% (c) 10% (d) 30%

Q.171. In what time will ₹ 4400 become ₹ 4576 at 8% per annum interest compounded half – yearly ?
RRB ALP 17/08/2018 (Morning)
(a) 7 months (b) 1 year
(c) 2 years (d) 6 months

Q.172. Shams invested ₹ 5000 at 10% per annum compound interest. After n years, Shams received ₹ 1655 more. Find the value of n (in years) .
RRB ALP 20/08/2018 (Afternoon)
(a) 4 (b) 3 (c) 1 (d) 2

Q.173. The simple interest on a certain sum at 12% per annum for 3 years is ₹4, 140. What is the compound interest on the same sum at 8% for two years ?
RRB ALP 29/08/2018 (Evening)
(a) ₹1,840 (b) ₹1,886.50
(c) ₹ 2,012.40 (d) ₹1,913.60

Answer key:-

1.(c)	2.(b)	3.(a)	4.(a)
5.(c)	6.(a)	7.(a)	8.(d)
9.(b)	10.(b)	11.(c)	12.(b)
13.(d)	14.(d)	15.(a)	16.(a)
17.(c)	18.(b)	19.(b)	20.(a)
21.(a)	22.(a)	23.(c)	24.(d)
25.(c)	26.(c)	27.(d)	28.(b)
29.(d)	30.(a)	31.(c)	32.(a)
33.(b)	34.(c)	35.(d)	36.(c)
37.(a)	38.(c)	39.(c)	40.(a)
41.(c)	42.(b)	43.(c)	44.(c)
45.(d)	46.(a)	47.(c)	48.(b)
49.(a)	50.(b)	51.(d)	52.(c)
53.(b)	54.(c)	55.(b)	56.(a)
57.(c)	58.(d)	59.(b)	60.(a)
61.(b)	62.(b)	63.(d)	64.(c)
65.(d)	66.(b)	67.(a)	68.(a)
69.(a)	70.(a)	71.(d)	72.(c)
73.(c)	74.(b)	75.(d)	76.(c)
77.(d)	78.(d)	79.(c)	80.(d)
81.(a)	82.(a)	83.(b)	84.(d)
85.(d)	86.(b)	87.(c)	88.(a)
89.(d)	90.(d)	91.(b)	92.(b)
93.(b)	94.(a)	95.(a)	96.(b)
97.(d)	98.(c)	99.(a)	100.(d)
101.(d)	102.(b)	103.(c)	104.(b)
105.(b)	106.(d)	107.(a)	108.(a)
109.(a)	110.(a)	111.(d)	112.(d)
113.(a)	114.(d)	115.(a)	116.(a)
117.(a)	118.(a)	119.(b)	120.(d)
121.(a)	122.(a)	123.(b)	124.(d)
125.(d)	126.(c)	127.(a)	128.(a)
129.(c)	130.(c)	131.(b)	132.(a)
133.(a)	134.(c)	135.(d)	136.(c)
137.(d)	138.(c)	139.(a)	140.(c)

141.(d)	142.(b)	143.(b)	144.(b)
145.(c)	146.(a)	147.(d)	148.(b)
149.(c)	150.(b)	151.(b)	152.(a)
153.(b)	154.(c)	155.(b)	156.(a)
157.(b)	158.(d)	159.(d)	160.(a)
161.(b)	162.(c)	163.(d)	164.(d)
165.(d)	166.(b)	167.(d)	168.(d)
169.(d)	170.(c)	171.(d)	172.(b)
173.(d)			

Solution:-

Sol.1.(c)
Money becomes 2 times → $10\ years$
Money becomes $2^4\ times$
→ $10 \times 4 = 40\ years.$

Sol.2.(b) Principal = ₹20,000 ,
Time = 1 year 4 months
Rate of interest for 1 year, 7.5 %
Rate of interest for 4 months
$= \frac{4}{12} \times \frac{15}{2} = 2.5\%$

Principal	:	Amount
200	:	215
200	:	205
40000	:	44075

Interest = 44075 - 40000 = 4075 units
40000 units → 20000
4075 units → 2037.5
C.I = ₹2,037.50

Sol.3.(a) Rate of compound interest per 8 months = $\frac{15}{12} \times 8 = 10\%$

Time = $2 \times \frac{12}{8}$ = 3 years

So, P = $98494 \times \frac{100}{110} \times \frac{100}{110} \times \frac{100}{110}$
= 74000
As per the question,
New amount
= $74000 \times \frac{115}{100} \times \frac{115}{100}$ = 97865

Sol.4.(a) Rate of interest for 10 months
= $\frac{12}{12} \times 10 = 10\%$
And time according to the rate of interest
= $\frac{5}{2} \times \frac{12}{10}$ = 3 years

P	:	A
10	:	11
10	:	11
10	:	11
1000	:	1331

Now,
1331 units → 50578 (given)
Therefore, value of x (1000 unit)
= $\frac{50578}{1331} \times 1000$ = ₹ 38000

Sol.5.(c) Rate of interest = 10%

	P	:	installment	
First year	10	:	11	× 11
Second year	100	:	121	

Installment is equal so by balancing ratio

	P	:	installment
First year	110	:	121
Second year	100	:	121
	210	:	121 × 2

So principal (210 unit) → ₹11550
Therefore each installment (121 unit)
→ $\frac{11550}{210} \times 121$ = ₹ 6655

Sol.6.(a) given, A = 9261 and P = 8000
$A = P(1 + \frac{r}{100})^3 \Rightarrow 9261 = 8000(1 + \frac{r}{100})^3$
$\frac{9261}{8000} = (1 + \frac{r}{100})^3 \Rightarrow (1 + \frac{r}{100}) = \frac{21}{20}$
$\Rightarrow \frac{r}{100} = \frac{1}{20} \Rightarrow$ So r = 5%
Rate of interest per annum = 5 × 2 = 10%

Sol.7.(a) Sum = 20,000 , Rate = 25%
Amount after 1 year
= $20000 \times \frac{125}{100}$ = 25,000
Sum after 1st installment
= 25,000 - 2,500 = 22,500
Amount after 2nd year
= $22500 \times \frac{125}{100}$ = 28,125
Sum after 2nd installment
= 28,125 - 2,500 = 25,625
Hence, required sum = ₹25,625

Sol.8.(d) Interest earned during the 2nd year = 2,761 , Rate = 10%
Let the amount = 100 unit
Amount in 1st year = $100 \times \frac{110}{100}$ = 110 unit
Amount in 2nd year = $110 \times \frac{110}{100}$ = 121 unit
Interest in 2nd year = 121 - 110 = 11 unit
According to question,
11 unit = 2761
100 unit = 25,100
So, required sum = 25,100

Sol.9.(b) (right option is B)
Amount = 3600
Rate of interest = 7.5%
Time = Half yearly basic amount
$= 3600 \times (1 + \frac{7.5}{200})^2 + 3600 \times (1 + \frac{7.5}{200})$
$= 3600 \times \frac{207.5}{200} \times \frac{207.5}{200} + 3600 \times \frac{207.5}{200}$
= 3875.06 + 3735 = 7610.06Rs.
C.I.= 7610.06 - 7200 = 410.06 Rs.

Sol.10.(b) Number of compounding cycles = $\frac{24}{8}$ = 3
$\sqrt[3]{7800} : \sqrt[3]{10381.80}$ = 10 : 11
Rate percent = $\frac{11-10}{10} \times 100 = 10\%$
(for 8-monthly)
Rate for yearly = $10 \times \frac{12}{8}$ = 15
(15 + 5)% = 20%
Rate for half-yearly = 10% = $\frac{1}{10}$

Principal	:	Amount
10	:	11
10	:	11
100	:	121

Interest = 121 - 100 = 21 units.
Required interest = $\frac{21}{100} \times 7800 = 1638$

Sol.11.(c) For Ram :
P = 8000, Rate = 30% , Time = 2 years
Amount = $8000 \times \frac{13}{10} \times \frac{13}{10}$ = 13520 Rs
For Dipti :
P = 8000, Rate = $30 \times \frac{8}{12}\%$ = 20% ,
Time = $2 \times \frac{12}{8}$ = 3 years
Amount = $8000 \times \frac{12}{10} \times \frac{12}{10} \times \frac{12}{10}$
= 13824Rs
Difference = 13824 - 13520 = 304Rs
Short tricks :-
Successive for Ram for 2 y at 30% = 69%
For Dipti - Rate = $30 \times \frac{8}{12}\%$ = 20%
Successive for Dipti for 3 cycle at 20% = 72.8%
Difference = 72.8% - 69 % = 3.8%
$8000 \times \frac{3.8}{100}$ = 304 Rs.

Sol.12.(b) Short trick:-
Effective interest rate in 4 year = 46.41%
Effective interest rate in 3 year = 33.1%
4th year interest = 46.41 - 33.1 = 13.31%
Compound interest for the 4th year
= 13.31% of 10,000 = 1331

Sol.13.(d) R = 10% = $\frac{1}{10}$

Timir	:	Monali
10	:	11
10	:	11
100	:	121

221 units → 22100
121 units → 12100

Sol.14.(d)
$P(1 + \frac{R}{100})^2 = 3025$.....(1)
$P(1 + \frac{R}{100})^3 = 3327.5$.....(2)
Now, divide eq .(2) by eq .(1)

$(1+\frac{R}{100})^1 = 1.1 \Rightarrow R = 10\%$

Now , Put the value of R in eq .(1)

P = ₹ 2,500 and R = 10%

Sol.15.(a) P = Rs. 5000 , R = 10

T = 3 years

For 3 years ,

Effective rate of CI = $10 + 10 + \frac{10 \times 10}{100}$

= 21% = $21 + 10 + \frac{21 \times 10}{100}$ = 33.1 %

Effective rate of SI = 10 + 10 + 10 = 30%

Difference between effective rate of CI & SI = 33.1% - 30% = 3.1%

Difference in amount

= $\frac{3.1}{100} \times 5000$ = ₹ 155.

Sol.16.(a) Let the sum borrowed = 100

SI for A in 1 year = 8

CI for B = 5 + 5 + $\frac{5 \times 5}{100}$ = 10.25

$\frac{CI\ of\ B}{SI\ of\ A} = \frac{10.25}{8}$ = 41:32

Sol.17.(c) The principal is invested at compound interest payable annually

Now , 225 : 236.25

Difference between them = 11.25

R % = $\frac{11.25}{225} \times 100$ = 5 %

Sol.18.(b) Let, each installment = x

A/Q ,

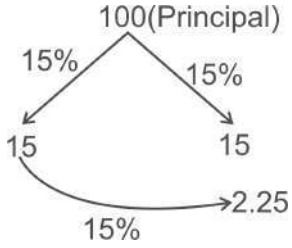
(present worth of x due 1 year) + (present worth of x due 2 year) = 1025

$\frac{20X}{21} + \frac{400X}{441}$ = 1025

820x = 1025 × 441

x = 551.25

Sol.19.(b) Let , principal = 100 unit



When , Rate = 15% for Rafique

Total compound interest in 2 years

= $(15 + 15 + \frac{15 \times 15}{100})$ = 32.25

When , Rate = 10% for Pritam

Then , Total compound interest in 2 years

= $(10 + 10 + \frac{10 \times 10}{100})$ = 21

Now , difference between them

= 32.25 - 21 = 11.25 unit

A/Q , 11.25 unit = 2250 Rs.

100 unit = Rs 20000

Sol.20.(a) P = Rs. 25000

A = $25000 \times \frac{104}{100} \times \frac{105}{100} \times \frac{106}{100}$

$= Rs\ 28,938$

CI = 28938 - 25000 = Rs 3938

Sol.21.(a) SI obtained by HDFC

= $\frac{1000000 \times 10 \times 3}{100} = 300000$

10% of 1000000 = 100000

10% of 100000 = 10000

10% of 10000 = 1000

CI of 3 year received by HUDCO

$= 3 \times 100000 + 3 \times 10000 + 1000$

$= 3,31,000$

Earning of HUDCO = 3,31,000 - 300000

= Rs 31000

Sol.22.(a)

Difference of C.I. and S. I .for 3 year = P($\frac{R}{100})^2 (\frac{300+R}{100})$

Required difference

= 10000 × $(\frac{3}{100})^2 (\frac{300+3}{100})$

= 10000 × $\frac{9}{10000} \times (\frac{303}{100})$

= $\frac{2727}{100}$ = 27.27 Rs

Sol.23.(c)

A.T.Q, Amount of A = Amount of B

A × 1 + $(\frac{5}{100})^5$ = B × $(1 + \frac{5}{100})^7$

$\frac{A}{B} = (\frac{21}{20})^2 \Rightarrow \frac{441}{400}$

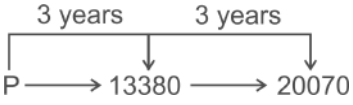
⇒ 841 unit = 3364 ⇒ 1 unit = 4

So , Share of A = 441 × 4 = 1764Rs.

Sol.24.(d) $(\frac{amount}{principal})^t = \frac{1331}{1000} = \frac{(11)^3}{(10)^3}$

(t = time) t = 3 years

Sol.25.(c)



A principal becomes 13380 after 3 years and 20070 after 6 years.

13380 : 20070

2 : 3

P × $\frac{3}{2}$ = 13380 ⇒ P = 2 × 4460

Principal = ₹ 8,920

Sol.26(c) Principal = $\frac{1000 \times 100}{8 \times 2}$ = ₹ 6250

P	:	A
25	:	27
25	:	27
625	:	729

C.I = 729 - 625 = 104

Now, 625 units → 6250

So, 104 units → $10 \times 104 = 1040$

C.I = ₹ 1,040

Sol.27.(d) P : A

25 : 26

25 : 26

625 : 676

625 units → 3000

Then, 676 units → $\frac{3000}{625} \times 676 = 3244.8$

Amount = ₹ 3,244.80

Sol.28.(b) Aggregate rate for 2 years

= 5 + 5 + $\frac{25}{100}$ = 10.25%

Aggregate percentage of interest

= $\frac{358.75}{3500}$ × 100 = 10.25%

Hence , time = 2 years = 24 months

Sol.29.(d)

20	:	21
20	:	21
400	:	441

5,00,000 — 441×1250=551250

Hence, after 2 years

total amount = ₹ 5,51,250

Sol.30.(a) Principle = T, time = M, rate = P

C.I = T$(1 + \frac{p}{100})^M$ - T

Sol.31.(c)

P		A
100	:	103
100	:	103
100	:	103
1000000	:	1092727

92727

C.I = $\frac{12500}{1000000} \times 92727 = ₹1159.8 \approx 1159$

Sol.32.(a) Interest is compounded half yearly , Rate = $\frac{10}{2}$ = 5 % & time = 2 year

P		A
20	:	21
20	:	21
400	:	441

×35: 14000 — 41×35=1435

Amount = 14000 + 1435 = ₹15,435

Sol.33.(b) Principal = ₹9000 , rate = 10%, time = 2 years.

P		A
10	:	11
10	:	11
100	:	121

9000 — 121×90=10890

Principle = 100 units = ₹9000

1 unit = 90

Amount after 2 years = 121 units

= 90 x 121 = ₹10,890

Sol.34.(c) In 6 years, the amount becomes 3 times
In (6 × 3) years, the amount will become $3^3\ times\ or\ 27\ times$
After 18 years, Amount = 27 × 36000
= ₹ 9, 72,000

Sol.35.(d) P : A
20 : 21
20 : 21
400 : 441
400 Units → Rs. 2400
441 units → Rs. 441 × 6
= Rs. 2646
Hence, amount after 2 years = ₹2,646

Sol.36.(c) Rate of interest for 6 months
= $\frac{20}{2}$ = 10%
And time according to rate
= 1 × 2 = 2 years
So, amount after 1 year
= 16000 × $\frac{110}{100}$ × $\frac{110}{100}$ = ₹ 19360

Sol.37.(a) Amount becomes 2 times in 6 years.
It will become 8 times
$(2^3) \rightarrow\ 6 \times 3\ =\ 18\ years.$

Sol.38.(c) A = P $(1 + \frac{r}{100})^n$
ATQ ,
$\frac{26620}{20000} = (1 + \frac{10}{100})^n \Rightarrow \frac{26620}{20000} = (\frac{11}{10})^n$
$\Rightarrow (\frac{11}{10})^n = \frac{1331}{1000} \Rightarrow (\frac{11}{10})^n = (\frac{11}{10})^3$
Hence n = 3 Years

Sol.39.(c) C.I = ₹612 , rate = 4% = $\frac{1}{25}$, time = 2 years

	P		A
First year →	25	:	26
Second year→	25	:	26
	625	:	676

So, Interest (676 - 625 unit) = 51 unit
51 unit → 612 , then 1 unit = 12
Now, Amount = 12 × 676 = ₹8112

Sol.40.(a) Given, Principal = ₹ 10,000 , rate = 5 % and time 2 years
(C.I - S.I) for 2 years →
$P \times (\frac{R}{100})^2 = 10000 \times \frac{25}{10000} = ₹25$

Sol.41(c) P : A
10 : 11
10 : 11
100 : 121
Now, 100 units denotes 12500
Then 1 unit = 125
Hence, the amount after 2 years
= 121 × 125 = ₹ 15,125

Sol.42.(b) P : A
20 : 21
20 : 21
20 : 21
8000 : 9261
9261 units corresponds to ₹ 92610
1 unit correspond to 10
So, The original deposited money
= 10 × 8000 = ₹ 80,000

Sol.43.(c) Let A's present share be x , and B's present share be y .
According to question ,
x × $(1 + \frac{4}{100})^7$ = y × $(1 + \frac{4}{100})^9$
$\frac{A's\ share(x)}{B's\ share(y)} = (1 + \frac{1}{25})^2 = \frac{676}{625}$
A's share (x) = $\frac{676}{625 + 676}$ × 3903
= $\frac{676}{1301}$ × 3903 = 2028 Rs.

Sol.44.(c) Principal : Amount
20 : 21
400 : 441
For equal installment ;
P : A
20 × 21 : 21 × 21
400 : 441
820 : 882
Now, 441 units → 882
Then, 820 units → 1,640
Hence, the sum borrowed = ₹1,640

Sol.45.(d) Given, Principal = 80,000
Rate is compounded quarterly,
rate = $\frac{12}{2}$ = 6 %
P A
100 : 106
100 : 106
10000 : 11236
10000 units → 80000
Then 11236 units → ₹89,888
Amount after 1 year = ₹89,888

Sol.46.(a) Given, principal = 80,000 , rate % = 4 % compounded half yearly,
So, effective rate = 2%
P : A
100 : 102
100 : 102
10000 : 10404
C.I = 10404 - 10000 = 404
10,000 units → 80,000
Then, 404 units → 3,232
Hence, the compounds interest = 3,232

Sol.47.(c) P : A
10,000 : 11,025
100^2 : 105^2
Now, required rate percentage
= $\frac{5}{100} \times 100 = 5\%$

Sol.48.(b) Principal = ₹28,700 , 5% = $\frac{1}{20}$

	Principal		amount
First year →	20 × 21	:	21 × 21
Second year →	400	:	441
	820	:	441 × 2

Therefore,
Annual equal payment
= $\frac{28700}{820}$ × 441 = ₹ 15,435

Sol.49.(a) Let the sum = 100
Effective interest rate in 3.5 years
= 8 × 3.5 = 28%
Amount = 100 + 28 = 128
Effective interest rate in 12 years
= 12 × 10.5 = 126%
Difference = 128 – 126 = 2 unit
According to the question,
2 unit = 156
100 unit = 7800
So, required sum = 7,800

Sol.50.(b) Amount triples in 10 years.
3^2 = 9
So, time required to become 9 times
= 10 × power = 10 × 2 = 20 years

Sol.51.(d) Let owed amount = x
Amount in 1 year = 12,500
Rate = 8%
x × $\frac{108}{100}$ = 12,500 ⇒ x = 11,574
Rate of interest in 6 months = 4%
Amount in 6 months = 11574 × $\frac{104}{100}$
= ₹12,036.96 ≈ ₹12,019

Sol.52.(c) Let the sum = 100
Amount in 4 years at compound interest
= 100 × $\frac{108}{100}$ × $\frac{108}{100}$ × $\frac{108}{100}$ × $\frac{108}{100}$
= 136.048896
Amount in 4 years at simple interest
= 100 + 32 = 132
Difference = 136.048896 - 132
= 4.048896 unit
According to the question,
4.048896 unit = 20
100 unit = 493.961810
So,
Required sum = 493.961810 or 493.96

Sol.53.(b) Let the principal be "P"
$\frac{59550.80}{56180} = \frac{53}{50}$
So, after each year sum becomes $\frac{53}{50}$ times of itself.
P × $\frac{53}{50}$ × $\frac{53}{50}$ = 56180
P = 50000

Sol.54.(c)
Effective CI rate for 3 years at 20% p.a.
= 20 + 20 + 20 +
$\frac{20\times20+20\times20+20\times20}{100}$ +
$\frac{20\times20\times20}{10000}$
= 60 + $\frac{1200}{100}$ + $\frac{8000}{10000}$
= 60 + 12 + 0.8 = 72.8
Effective SI rate for 3 years at 20% p.a.
= 20 × 3 = 60
According to the question,
72.8 − 60 = 12.8 which corresponds to ₹448,
so, sum invested = $\frac{100\times448}{12.8}$ = ₹3,500

Sol.55.(b)
Interest is compounded half yearly,
So, rate = 5%, Time = 2 years
Amount = 9800 × $\frac{105}{100}$ × $\frac{105}{100}$ = 10,804.5
Interest = 10804.5 - 9800 = 1004.5

Sol.56.(a)
Interest in 1 year = 675 - 625 = 50
Rate = $\frac{50}{625}\times100$ = 8%

Sol.57.(c) 60% = $\frac{3}{5}$
1st year = 5 : 8
2nd year = 5 : 8
25 : 64
Interest = 64 - 25 = 39 unit
As per question,
39 unit = 11700
25 unit = 7500
So, Invested amount = ₹ 7,500

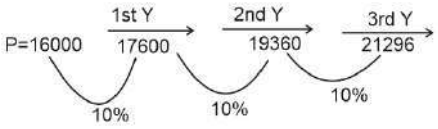
Sol.58.(d) Effective interest rate in 2 years when compounded annually = 96%
If interest is compounded half yearly,
R = 20% and time = 4 years
Effective interest rate = 107.36%
Difference = 107.36 - 96 = 11.36%
As per question,
11.36% = 4544
100% = ₹ 40,000

Sol.59.(b) 10% = $\frac{1}{10}$
1st year = 10 : 11
2nd year = 10 : 11
100 : 121
As per question,
100 unit = 5700
121 unit = 6897
So, Total amount = 6,897

Sol.60.(a)
For 2 years = $\sqrt{400}:\sqrt{484}$ = 20 : 22
Rate = $\frac{22-20}{20}\times100$= 10%

Sol.61.(b)
Effective interest rate in 2 year = 44%
Let the sum = 100 unit
Interest = 44 unit
As per question,
100 unit = 40,000
44 unit = 17,600
So, interest = ₹17,600

Sol.62.(b) Rate on interest
= $\frac{106480-96800}{96800}\times100\%$ = 10%

Sol.63.(d)


S.I = $\frac{16000\times10\times3}{100}$ = ₹4,800

Sol.64.(c) Let the money invested at 10% rate be x and at 20% be 10000 - x.
Now, $12928 = x(1+\frac{10}{100})^2 +$
$(10000-x)(1+\frac{20}{100})^2$
$12928 = x(1.1)^2 + (10000-x)\times(1.2)^2$
$\Rightarrow 12928 = 1.21x + (10000-x)1.44$
$\Rightarrow 12928 = 1.21x - 1.44x + 14400$
$\Rightarrow 0.23x = 1472 \Rightarrow x =$ ₹6400

Sol.65.(d) Short Trick:
For 2 years,
R% = $\frac{C.I.\ of\ two\ years - S.I.\ of\ two\ years}{S.I.\ of\ one\ year}\times100$
$\Rightarrow 9 = \frac{97.2}{S.I.\ of\ one\ year}\times100$
$\Rightarrow S.I.\ of\ one\ year$ = 1080
Now, sum invested
= $\frac{2\times1080\times100}{2\times9}$ = Rs 12000.

Sol.66.(b)
Rate of interest for the first 3 years = 20%
Rate of interest for 3 month = $\frac{20}{4}=5\%$

Principal	:	Amount
5	:	6
5	:	6
5	:	6
20	:	21
2500	:	4536

2500 units → 100000
(4536 - 2500 = 2036) units
→ 2036 × 40 = 81440

Sol.67.(a)
Principal = ₹31600 time = 1$\frac{1}{3}$years
$rate = 9\%$
Rate as per 8 monthly = $\frac{8}{12}\times9=6\%$
Time(n) = $\frac{16\ month}{8\ month}=2$
C.I = $31600[(1+\frac{R}{100})^n-1]$
= $31600(1+\frac{6}{100})^2-1]$
$= 31600(1+\frac{6}{50}+\frac{36}{10000}-1)$
= $31600\times\frac{1200+36}{10000}$
$= 31600\times\frac{1236}{10000}=3905.76\ or$ ₹3906

Sol.68.(a) Let the amount invested in Scheme A be ₹x and in Scheme B be ₹ (55800-x)
Now, C.I = $x\times\frac{6}{5}\times\frac{6}{5}$
$\Rightarrow x=\frac{11x}{25}$
S. I = $\frac{(55800-x)\times20\times4}{100}$
Now , $\frac{11x}{25}=\frac{4\ (55800-x)}{5}$
$\Rightarrow 55x+100x=5580000$
$\Rightarrow x=\frac{5580000}{155}=$ ₹36000

Sol.69.(a)
Amount = $5000\times\frac{6}{5}\times\frac{6}{5}\times\frac{6}{5}$
= ₹8,640

Sol.70.(a)
C.I = $15000[(1+\frac{2}{100})^2-1]=$ ₹606

Sol.71.(d) 10% = $\frac{1}{10}$
So. for 2 years,
10 : 11
10 : 11
100 : 121
121 units = 10164
So, 100 units = $\frac{10164}{121}\times100$ = ₹8400

Sol.72.(c)
Rate for half year = $\frac{20}{2}=10\%$

Principal	:	Amount
10	:	11
10	:	11
10	:	11
1000	:	1331

1000 units → 4000
1331 units → 5324
Hence, amount = ₹5324

Sol.73.(c)

Principal	:	amount
14000	:	18515
400	:	529

For 2 years,

$\sqrt{400}$: $\sqrt{529}$
20 : 23

Rate % = $\frac{3}{20} \times 100 = 15\%$

Now, Rate is compounded 8-monthly,

R = $\frac{3}{20} \times \frac{8}{12} = \frac{1}{10}$

$and\ time = 2 \times \frac{3}{2} = 3\ years$

CI = P[1 + $\frac{R}{100}$]^3 - P

= 14000 [1 + $\frac{1}{10}$]^3 - 14000

= 14000 × ($\frac{11}{10}$)^3 - 14000

= 14000 × $\frac{1331}{1000}$ - 14000

= 14 × 1331 - 14000 = 18634 - 14000

= 4634

Sol.74.(b) As we know ,

Simple Interest = $\frac{PRT}{100}$ = 500 ⇒ P = 2500

And the difference between SI and CI

= $\frac{R^2}{100}$ × 1% of P = $\frac{100}{100} \times \frac{2500}{100}$ = 25

So, the compound interest on the same sum at the same rate for the same time is = 500 + 25 = 525 Rs.

Sol.75.(d) As we know for two consecutive years ratio of amounts

= (1 + $\frac{r}{100}$) ⇒ (1 + $\frac{r}{100}$) = $\frac{13310}{12100}$

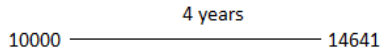
⇒ $\frac{r}{100}$ = $\frac{13310}{12100}$ - 1 ⇒ r = 10 %

Sol.76.(c) As we know for two consecutive years ratio of amounts

= (1 + $\frac{r}{100}$) ⇒ (1 + $\frac{r}{100}$) = $\frac{1700}{1600}$

⇒ $\frac{r}{100}$ = $\frac{17}{16}$ - 1 ⇒ r = 6.25 %

Sol.77.(d) The sum becomes $\frac{14641}{10000}$ times itself, If P = 10000 then A = 14641



$\sqrt[4]{10000}$: $\sqrt[4]{14641}$

⇒ 10 : 11

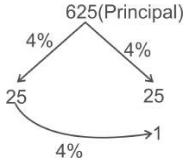
Rate = $\frac{1}{10} \times 100 = 10\%$

Sol.78.(d) A sum of Rs.12,000.00 deposited at compound interest becomes double at the end of 5 years.

So at the end of 15 years a sum of Rs.12,000 becomes $Rs.$96000.

Sol.79.(c) R = 4% = $\frac{1}{25}$

let Principal = 625



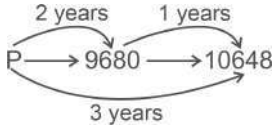
Difference between CI and SI is 1 unit.

1 unit → 200

625 unit → 200 × 625 = Rs.12500

So, Principal = Rs.12500

Sol.80.(d)



After 2 year, Principal for 3rd year = 9680

Ratio of Principal to Amount

= 9680 : 10648 = 10 : 11

Rate of interest = $\frac{1}{10} \times 100 = 10\%$

Sol.81.(a)

11% = $\frac{11}{100}$

So, Principal : Amount

100 : 111

100 : 111

10000 : 12321

So, Compound Interest

= 12321 - 10000 = 2321 units

Now, according to the question,

2321 units = 4642

So, 10000 units

= $\frac{4642}{2321} \times 10000$ = 20000(= Principal)

Now, S.I.

= $\frac{P \times R \times T}{100} = \frac{20000 \times 11 \times 2}{100}$

= Rs 4,400

Sol.82.(a) As we know, for compound interest,

$A = P(1 + \frac{R}{100})^2$

⇒ $(1 + \frac{R}{100}) = \sqrt{\frac{12544}{10000}}$

⇒ $(1 + \frac{R}{100}) = \frac{112}{100} \Rightarrow R = 12\%$

So, the amount after 2 years in case of simple interest would have been,

Simple Interest = $\frac{10000 \times 2 \times 12}{100}$ = 2400

Amount = 10000 + 2400 = 12400

So, he would have saved

= (12544 - 12400) = 144 Rs.

Sol.83.(b) Let the sum = 100

SI for Rajpal = 10 × $\frac{3}{2}$ = 15

For semi annually

R = $\frac{10}{2}$ = 5% and T = $\frac{3}{2}$ × 2 = 3

Compound interest for three years = 100

$(1 + \frac{5}{100})^3$ - 100 = 100($\frac{21}{20}$)^3 - 100

= 115.7625 - 100 = 15.7625

Difference = 15.7625 - 15 = 0. 7625

⇒ 0. 7625 = 305 ,1 = 400

Sum = 100 × 400 = Rs40,000

Sol.84.(d)

Let the amount borrowed = 100

For Kumud, SI = 10 × $\frac{3}{2}$ = 15

For Sneha ,

When CI compounded semiannually,

R = $\frac{10}{2}$ = 5% and T = $\frac{3}{2}$ × 2 = 3 years

5% of 100 = 5

5% of 5 = 0.25

5% of 0.25 = 0.0125

CI = (5 × 3) + (0.25 × 3) + 0.0125

= 15 + 0.75 + 0.0125 = 15.7625

Difference of CI and SI = 0.7625 which is equal to Rs 61

P = $\frac{61}{0.7625} \times 100$ = Rs 8,000

Short Tricks:-

For Kumud , SI = 10 × $\frac{3}{2}$ = 15%

For Sneha, CI compounded semiannually,

R = $\frac{10}{2}$ = 5% and T = $\frac{3}{2}$ × 2 = 3 cycle

C.I. = $5 + 5 + 5 + \frac{5 \times 5 + 5 \times 5 + 5 \times 5}{100}$

$- \frac{5 \times 5 \times 5}{10000}$ = 15.7625%

Change in % value

= 15.7625% - 15% = 0.7625%

According to question ,

0.7625% = 61 Rs.

100% = $\frac{61}{0.7625} \times 100$ = Rs 8,000

Sol.85.(d) Rate = $\frac{60}{6}$ = 10%

P : A

10 : 11

10 : 11

10 : 11

1000 : 1331

⇓

10,000

CI = 1331 - 1000 = 331 ⇒ Rs 3,310

Sol.86.(b)

If interest is compounding half yearly

R = 2 % and T = 2 years

Effective rate for Compound Interest

= 2 + 2 + $\frac{2 \times 2}{100}$ = 4.04%

Compound Interest

= $\frac{4.04}{100}$ × 15,000 = 606

Sol.87.(c) For 2 years ,

PR^2 = $Difference\ of\ CI\ and\ SI \times 100^2$

$\Rightarrow 15000 \times R^2 = 24 \times 10000$

$\Rightarrow R^2 = \frac{24 \times 10000}{15000} = 16 \Rightarrow$ R = 4%

Sol.88.(a) Given , P = 1200 , A = 1348.32 and time = 2 yrs.
For Rate , when time is 2 year then we get square root of the ratio of P and A
P : A → 120000 : 134832
= 10000 : 11236 = $(100)^2 : (106)^2$
So , Rate = $\frac{106-100}{100} \times 100$ = 6 %

Sol.89.(d)
The ratio of principal and amount
= $\sqrt{6600} : \sqrt{7986} \rightarrow$ 10 : 11
Rate = $\frac{1}{10} \times 100$ = 10%

Sol.90.(d) P = 16000 , Time = 2y and R% = 10% (For yearly)
A/Q .
The interest is payable half yearly then ,
Time = 4 unit , Rate = $\frac{10}{2}$ % = 5%

Now ratio between P : A
20 : 21
20 : 21
20 : 21
20 : 21

160000 : 194481

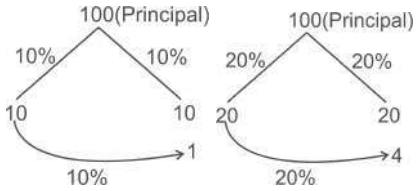
Where - 160000 → 16000
194481 → ?
So ⇒ ? = $\frac{16000 \times 194481}{160000}$ = 19448.1 Rs

Sol.91.(b) Given Sum = Rs 25,000
CI for 1st year = 4% of 25,000
= $\frac{4}{100} \times 25,000 = Rs\ 1000$
Principal for 2nd year = 25000 + 1000
= Rs 26,000
CI for 2nd year = 5% of 26,000
= $\frac{5}{100} \times 26,000 = Rs\ 1300$
Principal for 3rd year
= 26,000 + 1300 = Rs 27,300
CI for 3rd year = 6% of 27,300
= $\frac{6}{100} \times 27,300$ = Rs 1638
Total CI = 1000 + 1300 + 1638 = Rs 3,938

Sol.92.(b) Given ,
R% = 5% , SI = 50 ,Time = 2 year
P = $\frac{50 \times 100}{10}$ = 500 Rs.
Now,
20 : 21
20 : 21
---
400 : 441
400 → 500
41 → ? ⇒ ? = $\frac{500 \times 41}{400}$ = 51.25

Sol.93.(b) When CI compounded half yearly
R = $\frac{10}{2} = 5\%$
$and\ T = \frac{3}{2} \times 2 = 3\ years$
5% of 8000 = 400
5% of 400 = 20
5% of 20 = 1
Total CI = $400 \times 3 + 20 \times 3 + 1 = 1261$

Sol.94.(a)



CI of 2 years at 10% rate = 10 + 10 + 1 = 21
CI of 2 years at 20% rate = 20 + 20 + 4 = 44
Difference of CI = 44 - 21 = Rs 23

Sol.95.(a) For A (SI per annum)
P = 8000 Rs , Rate% = 8 % , T = 3y
SI = $\frac{8000 \times 8 \times 3}{100}$ = 1920
For B(CI per annum)
→ P = 6000 Rs , Rate% = 10 % , T = 3y
10 : 11
10 : 11
10 : 11

1000 : 1331
1000 unit = 6000
CI (331 unit) = 1986 Rs
Now CI - SI = 1986 - 1920 = 66 Rs

Sol.96.(b) For 2 years
$PR^2 = difference\ of\ C.I\ and\ S.I \times 100^2$
$\Rightarrow 16000 \times R^2 = 1000 \times 10000$
$\Rightarrow R^2 = \frac{10000}{16} = 625 \Rightarrow$ R = 25%

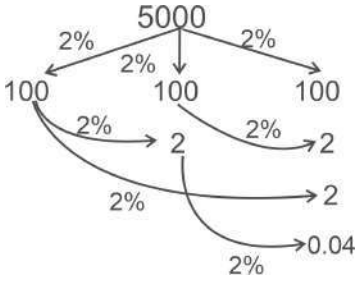
Sol.97.(d) Difference between the CI and the SI for 2 year
A/Q, 60 = P $(\frac{R}{100}) \times (\frac{R}{100})$
60 = 24000 $(\frac{R}{100}) \times (\frac{R}{100})$
$R^2 = 5 \times 5 \Rightarrow$ R = 5 %
Shortcut R^2%= Difference/Principle x 100

Sol.98.(c) Let the Principle = P
After 2 year 6400 will be the principle.
In next 2 year 6400 will become 8100
Now,
Ratio of principle to amount
$\Rightarrow \sqrt{6400} : \sqrt{8100}$
$\Rightarrow 80 : 90 = 8 : 9$
CI = 9 - 8 = 1
R = $\frac{1}{8} \times 100 = 12.5\%$

Sol.99.(a) P = 1 , A = 8 , Time = 3 year
Now time 3 year so that
$\sqrt[3]{1} : \sqrt[3]{8}$ = 1 : 2
R % = $\frac{2-1}{1} \times 100$ = 100%

Sol.100.(d)
Rate of compound interest per annum
= $\frac{550-500}{500} \times 100$ = 10 %

Sol.101.(d) Principal = Rs 5000 ,
Time = 1.5 years , Rate = 4%,
Amount = $5000(1 + \frac{4}{100})(1 + \frac{2}{100})$
$\Rightarrow 5000 \times \frac{104}{100} \times \frac{102}{100}$ = Rs 5304
Then , CI = 5304 - 5000 = Rs 304
CI half yearly , Time= 1.5 year = 3quarter ,
Rate = 4% = 2% half yearly
Amount
= $5000(1 + \frac{2}{100})(1 + \frac{2}{100})(1 + \frac{2}{100})$
$\Rightarrow 5000 \times \frac{102}{100} \times \frac{102}{100} \times \frac{102}{100}$
= Rs 5306.04
Then CI = 5306.04 - 5000 = 306.04
Difference between CI = 306.04 - 304
= Rs 2.04
Alternate:



Required difference = 306.04 - 304
= Rs 2.04

Sol.102.(b) Time = 2 years
Ratio of P and A = 1000 : 1440
= 100 : 144
$\sqrt{100} : \sqrt{144}$
10 : 12
If P = 10 , A = 12 after 1 year
R = $\frac{2}{10} \times 100 = 20\%$

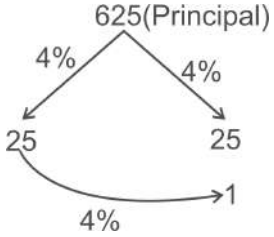
Sol.103.(c)
Given , P = 5000 , A = 5600 , Time = 1 yr.
Interest = $\frac{PRT}{100}$
$600 = (5000 \times R \times 1) \div 100$
50R = 600 ⇒ R = $\frac{600}{50}$ = 12 %

Sol.104.(b) Let the principal = X
A/Q ,
X × $\frac{106}{100} \times \frac{112}{100} \times \frac{118}{100} = 20,000$
X = $\frac{20000 \times 10^6}{106 \times 112 \times 118} = Rs\ 14,276.58$

Sol.105.(b) Amount after 2 year
= 4500 × 1.12 × 1.12 = 5644.8 Rs.
It will be principal for next 8 months,
Interest for next 8 months
= 5644.8 × $\frac{12}{100}$ × $\frac{8}{12}$ = 451.584 Rs.
Final amount
= 5644.8 + 451.584 = 6096.38 Rs.

Sol.106.(d) We know compound interest
= P$(1+\frac{R}{100})^T$ − P
= 7,500$(1+\frac{4}{100})^2$ - 7,500
= 7,500$(\frac{26}{25})^2$ - 7,500 = 8112 −7500
= 112 - 7,500 = 612

Sol.107.(a) R = 4% = $\frac{1}{25}$
Let P = 625



CI in 2 years = 25 × 2 + 1 = 51
A = 625 + 51 = 676
676 unit = 338
P = 625 unit = $\frac{338}{676}$ × 625 = Rs 312.5

Sol.108.(a) Let the principle = 100
5% of 100 = 5
5% of 5 = 0.25
5% of 0.25 = 0.0125
CI for 3 years
= 3 × 5 + 3 × 0.25 + 0.0125
= 15 + 0.75 + 0.0125 = 15.7625
15.7625 unit = Rs 3783
SI for 3 year = 3 × 5 = 15unit
= $\frac{3783}{15.7625}$ × 15 = Rs 3600

Sol.109.(a) P = 200 , R = 10%
10 % of 200 = 20
10% of 20 = 2
CI for 2 years = 20 × 2 + 2 = 42
IF R = 20%
20% of 200 = 40
20% of 40 = 8
CI for 2 years = 40 × 2 + 8 = 88
Difference of CI = 88 - 42 = 46 Rs.

Sol.110.(a) Given - R% = 5% , Time - 3 yrs , CI = 6305 Rs
20 : 21
20 : 21
20 : 21

P = 8000 : 9261 = A
we know that (A - P = CI)
So, 1261 unit = 6305 Rs
8000 unit = 40000 Rs
Then for SI ,
SI = $\frac{P\times R\times T}{100}$
SI = $\frac{40000\times 5\times 3}{100}$ = 6000 Rs

Sol.111.(d) P = 57600 Rs , A = 72900 Rs , Since the rate is compounded semi - annually so time = 2 cycle (of 6 month)
ratio between P and A
= $\sqrt{57600}:\sqrt{72900}$ = 240 : 270
R % = $\frac{30}{240}$ × 100 = 12.5% per 6 months
So , Rate = 12.5% × 2 = 25% per annum

Sol.112.(d)

total time = 12 + 12 = 24 years

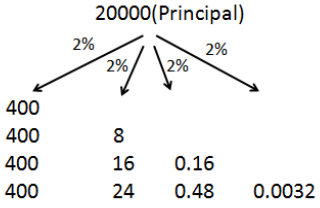
Sol.113.(a)
Given , R = 8 % , P = 20000 ,
Time = 2 years
100 : 108
100 : 108

P = 10000 : 11664 = A
CI = 1664 unit
10000 unit = 20000
1664 unit = $\frac{20000\times 1664}{10000}$ = Rs.3328

Sol.114.(d)
Given , CI = 154 , R = 10% , Time = 2 yrs
10 : 11
10 : 11

P = 100 : 121 = A
CI for 2nd year = 21 unit - 10 unit = 11 unit
A/Q ,
11 unit = 154
100 unit = $\frac{(154\times 100)}{11}$ = 1400 Rs

Sol.115.(a) R = 2% = $\frac{1}{50}$
Time = 4 years



CI for 4 years = 400 × 4 + 8 + 16 + 24 + 0.16 + 0.48 + 0.0032 = 1648.64

Sol.116.(a) The difference between the compound interest and the simple interest on a certain amount (P) at a rate of interest of 5% per annum for 2 years is Rs. 25.
i.e. $\frac{R^2}{100}\times\frac{P}{100}=25\Rightarrow P=10000$ Rs.
So, the amount is 10,000 Rs.

Sol.117.(a) A/Q ,
$(1+\frac{10}{100})^t=\frac{4840}{4000}\Rightarrow(\frac{11}{10})^t=\frac{121}{100}$
So, the time required = 2 years.

Sol.118.(a) Given that, Principle = 64000
Rate of interest = 25%
Amount owe after first installment
= 64000 × $\frac{125}{100}$ − 3200 = Rs. 76800
Amount owe after second installment
= 76800 × $\frac{125}{100}$ − 3200 = Rs. 92800
Amount owe after third installment
= 92800 × $\frac{125}{100}$ − 3200 = Rs. 112800

Sol.119.(b) 5% of 8000 = 400
5% of 400 = 20
CI for 2 years = 2 × 400 + 20 = 820
A = P + CI = 8000 + 820 = Rs 8820

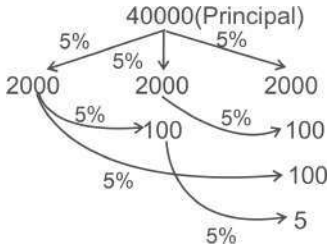
Sol.120.(d) Rate = 5% = $\frac{1}{20}$
Ratio → Principal : Amount
1st year → 20 : 21) × 21
2nd year → 400 : 441

Total Principal = {(20×21) + 400}
= 820 units = 2460 ₹
Each installments (441 units) →
441 × 3 = 1,323 ₹

Sol.121.(a)
150000 : 159135 = 10000 : 10609
P: A = $\sqrt{10000}:\sqrt{10609}$
P : A = 100 : 103 ⇒ CI = 3
R = $\frac{3}{100}$ × 100 = 3%

Sol.122.(a) let principal for A and B be x and y respectively
Amount of A = x$(1+\frac{3}{100})^7$ = x $(\frac{103}{100})^7$
Amount of B = y$(1+\frac{3}{100})^9$ = y$(\frac{103}{100})^9$
Since amounts are equal
x $(\frac{103}{100})^7$ = y$(\frac{103}{100})^9$ ⇒ $\frac{x}{y}=\frac{10609}{10000}$
x + y = 20,609 (given)
Hence x = 10609 , y = 10000

Sol.123.(b) P = 40,000
SI for Sunil = $\frac{40000\times 11\times 1.5}{100}$ = 6600
In case of CI compounded semi annually
R = $\frac{10}{2}$ = 5%



CI for Kamal = $3 \times 2000 + 3 \times 100 + 5$ = 6305
⇒ Sunil pay more interest ,
6600 - 6305 = Rs 295

Sol.124.(d) P : A = 4800 : 6000 = 4 : 5
Amount after 12 years
= $4800 \times \frac{5}{4} \times \frac{5}{4} \times \frac{5}{4}$ = 9375 Rs.

Sol.125.(d) Let the value of car 2 years ago = X rupees
$X \times \frac{88}{100} \times \frac{88}{100}$ = 774400
X = 10,00,000 Rs

Sol.126.(c)
A_1 = 729 , A_2 = 1,331 Time = 3 years
$\sqrt[3]{729}$: $\sqrt[3]{1331}$
9 : 11
Now, rate = $\frac{11-9}{9} \times 100 = 22\frac{2}{9}\%$

Sol.127.(a) P = 5000 Rs , CI = 253.125 , Time = 2 Yrs
A = 5000 + 253 . 125 = 5253.125
P : A = 5000000 : 5253125
= 1000000 : 1050625
For R , $\sqrt{P}$: $\sqrt{A}$
$\sqrt{1000000}$: $\sqrt{1050625}$
P : A After 1 year = 1000 : 1025
CI = 25
R = $\frac{25}{1000} \times 100 = 2.5\%$
SI = $\frac{5000 \times 2.5 \times 2}{100} = Rs\ 250$

Sol.128.(a)
Let , P = 4 unit , A = 9 unit , Time = 2 years
The ratio between P and A = 4 : 9
Time is two years, so find square root of both principal (P) and amount (A)
Hence , $\sqrt{P} : \sqrt{A} = \sqrt{4} : \sqrt{9}$ = 2 : 3
For rate , R = $\frac{1}{2} \times 100$ = 50%

Sol.129.(c) For 2 years
$PR^2 = Difference \times 100^2$
$\Rightarrow P \times 5 \times 5 = 1 \times 100 \times 100$
$\Rightarrow P = \frac{10000}{25} = Rs\ 400$

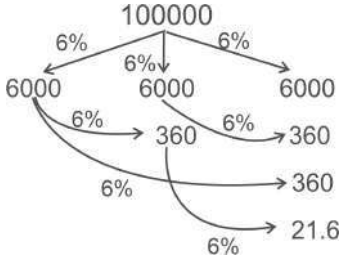
Sol.130.(c) Let the Principal = 100
12.5% of 100 = 12.5
12.5% of 12.5 = 1.5625
CI of two years
= $2 \times 12.5 + 1.5625 = 26.5625$
A/Q ,
26.5625 unit = Rs 6800
P = 100 unit
= $\frac{6800}{26.5625} \times 100 = Rs\ 25,600$

Sol.131.(b)
P = 400 , A = 441 and Time = 2 years
Time is two year so that square root of the ratio of P and A
P : A
√400 : √441
20 : 21
Now , for R
R = $\frac{21-20}{20} = \frac{1}{20}$ = 5%

Sol.132.(a)
Given , R = 5% and time = 3 year
Let, the sum be " P " Rs
Difference between CI and SI in 3 year = D_3
$D_3 = \frac{P \times R^2 \times (300 + R)}{(100)^3}$
$244 = \frac{P \times 5^2 \times (300 + 5)}{(100)^3}$
$244 = \frac{P \times 25 \times 305}{(100)^3}$
$244 = \frac{P \times 7625}{(100)^3}$
$P = \frac{244000000}{7625} \Rightarrow$ P = 32000

Sol.133.(a) Effective rate of CI for 2 year
= 6 + 6 + $\frac{6 \times 6}{100}$ = 12.36
Effective rate of CI for 3rd year
= 6 + 12.36 + $\frac{6 \times 12.36}{100}$ = 19.1016
Compound Interest for 3 year
= $\frac{19.1016}{100}$ × 5,000 = 955.08

Sol.134.(c)
Simple interest for 18 months
= $\frac{1,00,000 \times 12 \times 3}{100 \times 2}$ = 18000
For compound interest effective rate of interest = $\frac{12}{2} = 6\%$ and the time T
$= 18 \times 2 = 36\ months = 3\ years$



Total compound interest earned
= 6000 + 6000 + 6000 + 360 + 360 + 360 + 21.6 = 19101.6
Now, difference between simple interest and compound interest
= 19101.6 - 18000 = 1101.6

Sol.135.(d) P = 1250 and A = 1488.77
P : A = $\sqrt[3]{125000} : \sqrt[3]{148877}$ = 50 : 53
CI = 53 - 50 = 3
Rate of interest = $\frac{3}{50} \times 100 = 6\%$

Sol.136.(c)
Rate = 20% = $\frac{1}{5}$, P = 1P , Amount = 2P
Amount = $P\left(1 + \frac{R}{100}\right)^T$
$2P = P\left(1 + \frac{20}{100}\right)^T$
$2 = \left(\frac{120}{100}\right)^T \Rightarrow 2 = (1.2)^T \Rightarrow T = 4$

Sol.137.(d) Given, principal = ₹1000, rate% = 10%, time = 1.5 years
Interest is compounded half-yearly
Required rate = 5% , Time = 3 years.

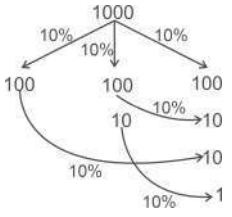
	Principal		Amount
First year ⟶	20	:	21
2nd year ⟶	20	:	21
3rd year ⟶	20	:	21
Overall	8000	:	9261

C.I. = 1261
8000 units → ₹1000
Then 1261 units → ₹157.63
So, the C.I = ₹ 157.63

Sol.138.(c) Given, C.I - S.I = ₹45 , Time = 2 years , rate% = 12.5%
C.I - S.I = $P\left(\frac{R}{100}\right)^2$
$\Rightarrow 45 = P \times \frac{12.5}{100} \times \frac{12.5}{100}$
$\Rightarrow P = \frac{45 \times 100 \times 100}{12.5 \times 12.5} \Rightarrow P = ₹2880$

Sol.139.(a) C.I for 2 years = 309 , S.I for 2 years = 300
S.I for 1 year = Rs.150
Now, C.I - S.I = (309 - 300) = Rs. 9
Rate % = $\frac{9}{150} \times 100$ = 6

Sol.140.(c)



Total simple interest
= 100 + 100 +100 = 300 unit
Total compound interest = 100 + 100 + 100 + 10 + 10 + 10 + 1 = 331 unit
Hence difference btw compound interest and simple interest = 331 - 300

31 unit = 620 Rs ⇒ 1 unit = 20 Rs
So principal
= 1000 unit = 1000 × 20 = 20000 Rs

Sol.141.(d)

Rate →	Principle	:	Installment
1st yr →	20) × 21	:	21) × 21
2nd year →	(20^2)	:	(21^2)

Total principle → $(20 \times 21) + (20^2)$
= 820unit
According to question ,
820 units = 16400 Rs.
therefore,
each installment (441 unit)
= $\frac{16400}{820} \times 441$ = 8820 Rs

Sol.142.(b)

	Principal	:	Amount
1st year →	25	:	26
2nd year→	25	:	26

Final →	625	:	676

According to question ,
676 unit = 338 Rs. ⇒ 1 unit = $\frac{1}{2}$Rs.
So , Principal = $\frac{1}{2} \times 625$ = 312.50 Rs.

Sol.143.(b)

Fractional value of 20% = $\frac{1}{5}$

	Principal	Amount
1st year →	(5	6) x 6
2 nd year →	25	36

Total →	55	72

So , principle = $(5 \times 6 + 25)\ unit$ = 55 unit = 1100 Rs.
1 unit = 20 Rs. therefore, each installment = 36 unit = 20 × 36 = 720 Rs.

Sol.144.(b) A.T.Q . ,
CI = 1638, R = 10% T = 2yr
Therefore,

Rate	Principle	:	Amount
1st year →	10	:	11
2nd year →	10	:	11
	100	:	121

CI(21)unit → 1638
so, P(100)unit = $\frac{1638}{21} \times 100$ = 7800
As we know → A = P + SI
Therefore, the original sum at 8% simple interest for 7 years be→
7800 = P + $\frac{P \times 8 \times 7}{100}$ → 7800 = $\frac{156P}{100}$
⇒ P = 5000 Rs

Sol.145.(c)
Let the principal = P Amount = 2P
R = $\frac{P \times 100}{P \times 8}$ = 12.5%
Ratio → Principal : Amount
1st yr. → 8 : 9
2nd yr. → 8 : 9

Final →	64	:	81

According to question ,
64 units = 8000 Rs.
C.I. for 2 years (17 units)
→ $\frac{8000}{64} \times 17$ = 2125 Rs.

Sol.146.(a)

Fractional value of 12.5% is $\frac{1}{8}$

Time	principal	:	Amount
1st year	8	:	9
2nd year	8	:	9

Final	64	:	81

17 unit = 510 Rs.
1 unit = 30 Rs. Principal = 64 × 30
= 1920 Rs.
S.I. = $\frac{1920 \times 2 \times 12.5}{100}$ = 480 Rs.

Sol.147.(d) According to the question,
P= $\frac{100 \times SI}{R \times T} \rightarrow \frac{100 \times 1200}{5 \times 3}$ = 8000
⇒ CI = 8000 × $\frac{21}{20} \times \frac{21}{20} \times \frac{21}{20}$ - 8000
⇒ CI = 8000 × $\frac{9261}{8000}$ - 8000 → 1261

Sol.148.(b) Let the sum be P.
For 2 years,
$(C.I. - S.I.) = P(\frac{R}{100})^2$
⇒ 8 = $P(\frac{8}{100})^2$ ⇒ P = $\frac{8 \times 10000}{64}$
⇒ P = 1250 Rs.

Sol.149.(c)
C.I.and S.I. for the first year →135Rs.
C.I. for 2nd year
→ 282.15 − 135 = 147.15Rs.
Difference b/w S.I. and C.I. in 2 yrs.
= 282.15 - 270 = 12.15Rs.
Rate% = $\frac{12.15}{135} \times 100$ = 9%

Sol.150.(b)

Successive formula = a + b + $\frac{ab}{100}$
if the interest is payable yearly, then
20 + 20 + $\frac{20 \times 20}{100}$ = 44% ,
if the interest is payable half yearly, then
10 + 10 + $\frac{10 \times 10}{100}$ = 21%
and 21 + 21 + $\frac{21 \times 21}{100}$ = 46.41%,
then more interest = (46.41 - 44)%
⇒ 2.41% = 482 then
⇒ 1% = $\frac{482}{2.41}$ = 200 ⇒ 100% ⇒ 20000

Sol.151.(b) A = P $(1 + \frac{R}{100})^t$
⇒ 1331 = 1000$(1 + \frac{10}{100})^t$
$\frac{1331}{1000} = (\frac{11}{10})^t \Rightarrow (\frac{11}{10})^3 = (\frac{11}{10})^t$
On comparing , we get Time = 3 years

Sol.152.(a) Simple Interest
= $\frac{Principal \times Rate \times Interest}{100}$
Net effective rate → 10 +10 + $\frac{10 \times 10}{100}$
= 21%
According to question ,
$\frac{x \times 8 \times 3}{100} = \frac{1}{2} \times \frac{4000 \times 21}{100}$
⇒ $x = \frac{2000 \times 7}{8} \Rightarrow x$ = 1750 Rs.

Sol.153.(b) Compound interest for 2nd years = 800 Rs.
Compound interest for 3rd years = 840 Rs.
So, rate of interest = $\frac{840 - 800}{800} \times 100$
= $\frac{40}{800} \times 100 = 5\%$

Sol.154.(c) Effective interest rate
→ 20 + 20 + $\frac{20 \times 20}{100}$ = 44%
Amount after 2 years. = 10000 × $\frac{144}{100}$
= Rs.14,400

Sol.155.(b)
C.I in 1st year → Rs.1350
C.I in 2nd year → Rs.1458
= Rs.1350 + Rs.108
Required rate % = $\frac{108}{1350} \times 100$ = 8%

Sol.156.(a) C.I. for 1st year = 1440 Rs.
Rate for the 2nd year = 10%
C.I. for 2nd year = 1440 × $\frac{11}{10}$ = 1584 Rs.

Sol.157.(b) Rate = 15% = $\frac{+3}{20}$

Principal	:	Amount
20	:	23
20	:	23
400	:	529

Here, 400 unit = 18000
529 unit = $\frac{18000 \times 529}{400}$
= 45 × 529 = 23805 Rs.

Sol.158.(d) Difference between C.I and S.I for two year = $P(\frac{R}{100})^2$
⇒ 462 = $P(\frac{10}{100})^2$

$\Rightarrow 462 = P(\frac{1}{100}) \Rightarrow P = 46200$

Sol.159.(d) Rate = 15% = $\frac{+3}{20}$

Principal	:	Amount
20	:	23
20	:	23
400	:	529

Here, 400 unit = 32000

529 unit = $\frac{32000 \times 529}{400}$

= 80 × 529 = 42320 Rs.

Sol.160.(a) Difference between C.I. and S.I. for two years

= P $(\frac{R}{100})^2$

523 = P $(\frac{10}{100})^2$

523 = P $(\frac{1}{100}) \Rightarrow$ P = 52300

Sol.161.(b) Rate = 10% = $\frac{+1}{10}$

Principal	:	Amount
10	:	11
10	:	11
10	:	11
1000	:	1331

Here, 1000 unit = 26000

1331 unit = $\frac{26000 \times 1331}{1000}$ = 34606Rs.

Sol.162.(c) Difference between C.I. and S.I.for two year = $P(\frac{R}{100})^2$

$\Rightarrow 32 = P(\frac{4}{100})^2 \Rightarrow 32 = P(\frac{16}{10000})$

$\Rightarrow P = \frac{320000}{16} \Rightarrow P = 20000$

Sol.163.(d) Difference between C.I. and S.I.for two year = $P(\frac{R}{100})^2$

$\Rightarrow 36 = P(\frac{4}{100})^2 \Rightarrow 36 = P(\frac{16}{10000})$

$\Rightarrow P = \frac{360000}{16} \Rightarrow P = 22500$

Sol.164.(d) Difference between CI and SI for two years = $P(\frac{R}{100})^2$

$\Rightarrow 40 = P(\frac{4}{100})^2 \Rightarrow 40 = P(\frac{16}{10000})$

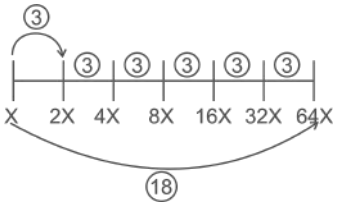
$\Rightarrow P = \frac{400000}{16} \Rightarrow P = ₹ 25000$

Sol.165.(d)

The amount becomes 2 times in 3 years.

Time taken for the amount to become (2^6 = 64 times) = 3 × 6 = 18 years

Short tricks :-



Sol.166.(b) Difference between ci and si for two year = $P(\frac{R}{100})^2$

$\Rightarrow 76 = P(\frac{4}{100})^2 \Rightarrow 76 = P(\frac{16}{10000})$

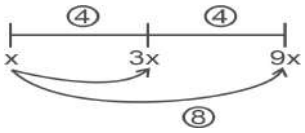
$\Rightarrow P = \frac{760000}{16} \Rightarrow P = 47500$

Sol.167.(d)

The amount becomes 3 times in 4 years.

Time taken for the amount to become (3^2 = 9 times) = 2 × 4 = 8 years

Short tricks :-



Sol.168.(d) Difference between ci and si for two year = $P(\frac{R}{100})^2$

$\Rightarrow 60 = P(\frac{4}{100})^2 \Rightarrow 60 = P(\frac{16}{10000})$

$\Rightarrow P = \frac{600000}{16} \Rightarrow P = 37500$

Sol.169.(d) Let the principal be 100%

SI on certain principal for 3 year at 5% = 5 × 3 = 15% corresponds to ₹5250

Then, principal amount

= $\frac{5250}{15}$ × 100 = ₹35,000

Amount after 3 years on the same sum at the same rate compounded annually for the same period

= 35,000 × $(\frac{21}{20})^3$ = ₹40,516.875

Required SI

= 40,516.875 - 35,000 = ₹5,516.875

Sol.170.(c) Amount = P$(1 + \frac{R}{100})^3$

$1331 = 1000(1 + \frac{R}{100})^3$

$\Rightarrow \frac{1331}{1000} = (1 + \frac{R}{100})^3$

$\Rightarrow (\frac{11}{10})^3 = (1 + \frac{R}{100})^3$

Comparing both side, we have :

$\Rightarrow \frac{11}{10} = 1 + \frac{R}{100} \Rightarrow \frac{1}{10} = \frac{R}{100}$

So, R = 10%

Sol.171.(d) Rate of 6 months = $\frac{8}{2}$% = 4%

Amount = P$(1 + \frac{R}{100})^n$

$\Rightarrow 4576 = 4400 (1 + \frac{4}{100})^3$

$\Rightarrow \frac{4576}{4400} = (\frac{26}{25})^n \Rightarrow (\frac{26}{25}) = (\frac{26}{25})^n$

On comparing both side, we get :

n = 1 half year or 6 months

Sol.172.(b) Amount after n years

= P$(1 + \frac{R}{100})^n$

$\Rightarrow 6655 = 5{,}000(1 + \frac{R}{100})^n$

$\Rightarrow \frac{6655}{5{,}000} = (\frac{11}{10})^n \Rightarrow \frac{1331}{1000} = (\frac{11}{10})^n$

$\Rightarrow (\frac{11}{10})^3 = (\frac{11}{10})^n$

On comparing both side, we get n = 3yrs

Sol.173.(d) Let the sum be 100%

SI on the certain sum for 3 yrs at the rate of 12% = 3 × 12% = 36% which corresponds to ₹4,140

Then, 100% corresponds to

$\frac{4140}{36}$ × 100 = ₹11,500

Now,

CI on the same sum for 2 years at the rate of 8% i.e.$\frac{2}{25}$ = 11,500$[(\frac{27}{25})^2 - 1]$

= 11,500 $[\frac{729 - 625}{625}]$ = 11,500 × $\frac{104}{625}$

= ₹1913.60

Average

Key Points:

1) An average or arithmetic mean of given data is the sum of the given observations divided by the number of observations.

For example : If we have to find out the average of 10, 15, 25 and 30, then required average will be equal to:

$\frac{10+15+25+30}{4} = \frac{80}{4}$ = 20

Therefore, we can say, Average (A)

$= \frac{Sum\ of\ the\ given\ observations\ (S)}{Number\ of\ Observations\ (N)}$

2) If all the numbers increase by 'a' then the average of the numbers will also increase by 'a'.

3) If all the numbers decrease by 'a' then the average of the numbers will also decrease by 'a'.

4) If all the numbers are multiplied by 'a' then their average must also be multiplied by 'a'.

5) If all the numbers are divided by 'a' then their average must also be divided by 'a'.

6) Average of first n natural numbers

$= (\frac{n+1}{2})$

7) Average of first n even numbers

$= (n + 1)$

8) Average of first n odd numbers = n

9) Average of consecutive numbers

$= \frac{First\ number + Last\ number}{2}$

10) Average of 1 to n odd numbers

$= \frac{Last\ odd\ number\ + 1}{2}$

11) Average of 1 to n even numbers

$= \frac{Last\ even\ number + 2}{2}$

12) Average of squares of first n natural numbers = $\frac{(n+1)(2n+1)}{6}$

13) Average of cubes of first n natural numbers = $\frac{n(n+1)^2}{4}$

14) Average of n multiples of any number

$= \frac{number\ \times (n+1)}{2}$

15) Combined mean or combined average :

If the mean of n_1 and n_2 observations are $\overline{x_1}$ and $\overline{x_2}$ respectively then,

Combined mean = $\frac{n_1\overline{x_1} + n_2\overline{x_2}}{n_1 + n_2}$

Ex : If the average marks of 30 boys is 50 and 40 girls is 60, then find the combined average marks of the whole class.

Soln : Combined average marks of whole class = $\frac{30 \times 50 + 40 \times 60}{30 + 40}$

= $\frac{1500 + 2400}{70} = \frac{3900}{70}$ = 55.71 marks

16) Basically the term Run Rate means how many runs have been scored in one over of a cricket match. Higher run rate is good for batsmen.

Run rate = $\frac{Total\ runs\ scored}{Number\ of\ overs\ played}$

Ex : If the batsman has scored 225 runs in 9 overs, find his run rate.

Soln : Run rate = $\frac{225}{9}$ = 25 runs/over

17) Bowling Average

$= \frac{Total\ runs\ allowed}{Total\ number\ of\ wickets\ taken}$

Lower Bowling average is good for bowlers.

Ex : If the bowler has taken 3 wickets allowing 120 runs, find his bowling average.

Bowling Average = $\frac{120}{3}$ = 40 runs/wicket

18) If the average is x and a number having value greater than x is added then the new average will be greater than x. Similarly, if a number having value less than x is added then the new average will be less than x.

Ex 1. The average of the first five natural numbers is 3. Find a new average after adding 6.

Soln : The first five natural numbers are : 1, 2, 3, 4, 5.

Sum of first five natural numbers

= 3 × 5 = 15

As number 6 is greater than the old average, the new average is going to be greater than the old average.

So, new average = $\frac{15+6}{5+1} = \frac{21}{6}$ = 3.5

which is greater than 3.

Ex 2. The average of the first five natural numbers is 3. Find a new average after adding 2.

Soln : The first five natural numbers are : 1, 2, 3, 4, 5.

Sum of first five natural numbers

= 3 × 5 = 15

As number 2 is less than the old average, the new average is going to be less than the old average.

So, new average = $\frac{15+2}{5+1} = \frac{17}{6}$ = 2.83

which is less than 3.

19) If the average is x and a number having value less than x is removed then the new average will be greater than x. Similarly, if a number having value greater than x is removed then the new average will be less than x.

Ex 1. The average of the first five natural numbers is 3. Find a new average after removing 2.

Soln : The first five natural numbers are : 1, 2, 3, 4, 5.

Sum of first five natural numbers

= 3 × 5 = 15

As number 2 is less than the old average, the new average is going to be greater than the old average.

So, new average = $\frac{15-2}{5-1} = \frac{13}{4}$ = 3.25

which is greater than 3.

Ex 2. The average of the first five natural numbers is 3. Find a new average after removing 4.

Soln : The first five natural numbers are : 1, 2, 3, 4, 5.

Sum of first five natural numbers

= 3 × 5 = 15

As number 4 is greater than the old average, the new average is going to be less than the old average.

So, new average = $\frac{15-4}{5-1} = \frac{11}{4}$ = 2.75

which is less than 3.

Variety Questions

Q.1. The average of 11 numbers arranged in an order is 41. The average of the first five numbers is 18 and that of the last five numbers is 64. What is the sixth number ?

Group D 17/08/2022 (Morning)

(a) 55 (b) 64 (c) 45 (d) 41

Q.2. A group of people contains men, women and children. If 40% of them are men, 35% are women and the rest are children and their average weights are 70 kg, 60 kg and 30 kg, respectively. The average weight of the group is:

Group D 18/08/2022 (Evening)

(a) 45.5 gm (b) 56.5 gm

(c) 56.5 kg (d) 45.5 kg

Q.3. In Munnar, a travel company has three 4-seater cars and two 8-seater maxi cabs. The rate of each passenger for a round trip in a car is Rs.25 and for a round trip in a maxi cab is Rs.20. The average occupancy of the seats is 100%. What is the average earning of each vehicle for one round trip?

Group D 25/08/2022 (Afternoon)

(a) Rs.125 (b) Rs.126

(c) Rs.124 (d) Rs.127

Q.4. Raghav's average earning per month in the first three months of a year was ₹

45,000. In April, his earning was $33\frac{1}{3}\%$ more than the average earning in the first three months. If his average earning per month for the whole year is ₹ 45,300, then what will be Raghav's average earning (in ₹) per month from May to December?
Group D 01/09/2022 (Afternoon)
(a) 43,450 (b) 43,580
(c) 43,425 (d) 43,575

Q.5. The average of 10 observations is 46. It was realised later that an observation was misread as 42 in place of 142. Find the correct average.
Group D 08/09/2022 (Afternoon)
(a) 45 (b) 54 (c) 65 (d) 56

Q.6. The average weight of all children in a group is 45 kg. If 10 children of average weight 42 kg leave the group and 2 children of average weight 55 kg join the group, then the average weight of the children in the group increases by $1\frac{1}{4}$kg. The number of children in the group initially was:
Group D 09/09/2022 (Afternoon)
(a) 48 (b) 38 (c) 52 (d) 42

Q.7. Vishnu scored X runs in his 10^{th} innings. After scoring those runs, his average per innings increased by 8 runs. If the new average is 28, then find the value of X.
Group D 06/10/2022 (Morning)
(a) 110 (b) 90 (c) 105 (d) 100

Q.8. Renu's marks were wrongly entered as 99 in place of 9. Due to this error, the average marks of the class were 2.25 more than the actual average. What is the number of students in the class?
NTPC CBT II Level 6 (09/05/2022) Shift 2
(a) 40 (b) 36 (c) 42 (d) 38

Q.9. The average of 25 numbers is 55. The average of first 11 numbers is 51 and the average of the last 10 numbers is 56. What is the average of 66, 70 and the remaining 4 numbers out of given 25 numbers?
NTPC CBT II Level 5 (15/06/2022) Shift 2
(a) 68 (b) 65 (c) 66 (d) 64

Q.10. The average spending of a Family per week during a four-week period on essential items was Rs 1475 . During the first three weeks the family spent Rs 1200 , Rs 1500, and Rs 1875 on such items. How much did the family spend on these items in the final week to ensure that the weekly average is maintained?
NTPC CBT II Level 5 (15/06/2022) Shift 3
(a) 1325 (b) 1225 (c) 1275 (d) 1375

Q.11. The average salary of the entire staff of an office is Rs.3,560 per month. The average salary of the officers is Rs.5,400 per month and that of non-officers is Rs.2600 per month. If the number of officers is 12. Find the number of non-officers in the office.
NTPC CBT - I 30/12/2020 (Evening)
(a) 25 (b) 22 (c) 24 (d) 23

Q.12. The difference between the mean of first 5 composite numbers and the mean of the first five prime numbers is ?
NTPC CBT - I 07/01/2021 (Morning)
(a) 1.8 (b) 2.4 (c) 1.6 (d) 2.6

Q.13. If the average of a_1 , a_2 , a_3 and a_4 is 19.5, a_1 = 21 and the average of a_1 , a_2 and a_3 is equal to the average of a_2 , a_3 and a_4 , then what will be the value of a_4.
NTPC CBT - I 17/01/2021 (Morning)
(a) 18 (b) 25 (c) 20 (d) 21

Q.14. Sonal was given some money to take care of her travel expenses during a 16-days sales drive. However, she had to increase her stay by another 8 days, as a result her average daily travel allowance went down by Rs. 80. How much was allowance to her in the beginning?
NTPC CBT - I 17/02/2021 (Evening)
(a) Rs. 3,750 (b) Rs.3,840
(c) Rs.3,820 (d) Rs.3,760

Q.15. The average marks obtained by a group of 25 students was 36. One student left the group, as a result of which the average of the remaining students rose to 37.5. Soon after another student joined the same group, as a result of which the average marks dropped to 37.2. Find the average marks of the student who left and the student who joined the group.
NTPC CBT - I 03/03/2021 (Evening)
(a) 30 (b) 15 (c) 22.5 (d) 37.5

Q.16. The mean of a distribution is 14 and standard deviation is 5. Find the coefficient of variation.
RRB JE 01/06/2019 (Morning)
(a) 48.3% (b) 60.4% (c) 27.9% (d) 35.7%

Q.17. In a class, there were 9 boys and some girls. In a test the average score obtained by the boys was 12 while that obtained by the girls was 14. If the overall average was 13.1, what was the total number of students in the class?
RRB ALP Tier - I 09/08/2018 (Morning)
(a) 21 (b) 19 (c) 22 (d) 20

Q.18. After 10 innings the average score per innings of a batsman was 52. After 12 innings the average rose to 54. If the batsman had scored 16 more runs in the 12^{th} innings than in the previous one, how many runs did he score in the 11^{th} innings?
RRB ALP Tier - I 14/08/2018 (Morning)
(a) 54 (b) 53 (c) 56 (d) 55

Q.19. The average marks obtained by a group of 10 students were 20. One student left the group as a result of which the average of the remaining students rose to 21. But another student joined, as a result of which the average marks of the group dropped a bit and became 20.6. What were the average marks obtained by the student who left and the one who joined?
RRB ALP Tier - I 17/08/2018 (Evening)
(a) 14 (b) 13 (c) 16 (d) 15

Q.20. The expenditure of a company was Rs.32,400 during the first quarter of the Financial Year, Rs.21,600 during the second quarter of the Financial Year, Rs.79,200 for the third quarter of the Financial Year. If overall quarterly average expenditure during the whole Financial Year is Rs.50,400. Find the expenditure for the last quarter of the Financial Year. (in Rs.)
RPF Constable 18/01/2019 (Morning)
(a) 64,800 (b) 86,400
(c) 84,600 (d) 68,400

Q.21. Dinesh scored 68 out of 80 in French, 78 out of 100 in English, 48 out of 70 in Spanish and 28 out of 50 in Japanese. Find the total percentage of marks obtained by him?
RPF S.I. 19/12/2018 (Morning)
(a) 44% (b) 84% (c) 74% (d) 64%

Q.22. An English-based company has 629 men and 629 female employees in a collaborative project. The average attendance of all employees is 72 calls per day. On average, an average 72 calls are received by a male employee every day. What will be the average of the number of calls being attendance by the women staff daily?
RPF S.I. 05/01/2019 (Morning)
(a) 72 (b) 74 (c) 71 (d) 73

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.23. A class of 30 students appeared in

a test. The average score of 12 students is 80, and that of the rest is 75. What is the average score of the class?
Group D 18/08/2022 (Afternoon)
(a) 87 (b) 67 (c) 77 (d) 56

Q.24. The average of the first twelve multiples of 11 is:
Group D 22/08/2022 (Afternoon)
(a) 68.5 (b) 71.5 (c) 69.5 (d) 70.5

Q.25. The average of thirteen consecutive integers is 36. If two times the smallest of these 13 integers is added to the largest of these 13 integers. What will be the sum obtained?
Group D 23/08/2022 (Morning)
(a) 115 (b) 121 (c) 102 (d) 110

Q.26. If the average of 5 consecutive even numbers is 10, then find the number at the center when these five numbers are arranged in ascending order.
Group D 23/08/2022 (Afternoon)
(a) 20 (b) 14 (c) 12 (d) 10

Q.27. A batsman scored runs in the last 5 innings as follows. If the average score is 43, then find his score in the 4th innings.

1^{st}	2^{nd}	3^{rd}	4^{th}	5^{th}
92	53	35	x	27

Group D 24/08/2022 (Afternoon)
(a) 12 (b) 8 (c) 4 (d) 10

Q.28. If the average of two numbers is 26 and one of them is 12, then find the other number.
Group D 24/08/2022 (Evening)
(a) 52 (b) 20 (c) 14 (d) 40

Q.29. The average of 70 values is 40. If each value is multiplied by 20, what will be the changed average?
Group D 26/08/2022 (Morning)
(a) 800 (b) 60 (c) 90 (d) 1400

Q.30. There are two sections, A and B, of a class, consisting of 40 and 50 students, respectively. If the average weight of students in section A is 36 kg and that of those in section B is 45 kg, then the average weight of the whole class is:
Group D 30/08/2022 (Afternoon)
(a) 39 kg (b) 43 kg (c) 42 kg (d) 41 kg

Q.31. The total expenditure of Krishna in a year is ₹4,20,000. If his salary per month is ₹45,000, then find his average savings per month.
Group D 08/09/2022 (Morning)
(a) ₹16,000 (b) ₹10,000
(c) ₹12,000 (d) ₹14,000

Q.32. The average sale of cars by a dealer per day in the month of March, other than on Saturdays and Sundays, is 125. The average sale of cars per day on Sundays is 150. What is the average sale of cars per day on Saturdays, if the first Saturday is on the 3rd of March and average sale of cars per day for the whole month is 130?
Group D 08/09/2022 (Evening)
(a) 140 (b) 136 (c) 132 (d) 138

Q.33. There are 20 members in group A, 32 members in group B and 28 members in group C. All the members of these groups went to a restaurant. The average amount spent on each member of group A, B and C is ₹120, ₹125 and ₹100, respectively. The total average amount (in ₹) spent per member is:
Group D 08/09/2022 (Evening)
(a) 115 (b) 118 (c) 116 (d) 112

Q.34. A class of 20 students took a science test. 8 students had an average (arithmetic mean) score of 60. The remaining students had an average score of 40. The average score of the whole class is:
Group D 12/09/2022 (Morning)
(a) 68 (b) 48 (c) 58 (d) 40

Q.35. The average of the prime numbers between 11 and 30 is:
Group D 12/09/2022 (Afternoon)
(a) 19.6 (b) 20.2 (c) 19.5 (d) 20.3

Q.36. The average of 41 numbers is 62. The average of the first 18 numbers is 65.5 and the average of the last 24 numbers is 61.5. If the 18^{th} number from the beginning is excluded, then what is the average of the remaining numbers?
Group D 12/09/2022 (Afternoon)
(a) 60.725 (b) 61.625
(c) 60.5 (d) 61.325

Q.37. The average of 3^2, 4^2, 5^2, 6^2 and 7^2 is _____.
Group D 14/09/2022 (Evening)
(a) 24 (b) 27 (c) 28 (d) 25

Q.38. The average of the first 35 natural numbers is_____.
Group D 15/09/2022 (Afternoon)
(a) 18.5 (b) 17.5 (c) 17 (d) 18

Q.39. The average weight of 6 persons increases by 2 kg when one of them whose weight is 72 kg is replaced by a new man.The weight of the new man is:
Group D 16/09/2022 (Morning)
(a) 74 kg (b) 84 kg (c) 104 kg (d) 94 kg

Q.40. The average weight of 32 parcels was recorded as 96 kg. If the weight of one more parcel is included, the average is increased by 2 kg. The weight of the new parcel is:
Group D 16/09/2022 (Afternoon)
(a) 192 kg (b) 162 kg
(c) 182 kg (d) 172 kg

Q.41. The average weight of 11 students is 50 kg. When the teacher's weight of 70 kg is added to the total, then the new average weight will be:
Group D 18/09/2022 (Evening)
(a) 50.66 (b) 53.66 (c) 51.36 (d) 51.66

Q.42. The average score of a cricketer for 10 matches is 40 runs. If the average for the first six matches is 44, then the average runs of the last four matches is:
Group D 18/09/2022 (Evening)
(a) 20 (b) 38 (c) 42 (d) 34

Q.43. At a health club, 80% of the members are men and the remaining 20% are women. The average age of the male members is 30 years and the average age of the female members is 40 years. The combined average age of all the members of this health club is_____ years.
Group D 19/09/2022 (Afternoon)
(a) 35 (b) 31 (c) 33 (d) 32

Q.44. The mean weight of 18 jackfruits is 7.2 kg. If the weights of 2 more jackfruits whose weights are equal are added, the mean weight decreases by 20 gm. What is the weight of each jackfruit added later?
Group D 22/09/2022 (Evening)
(a) 7.18 kg (b) 7.22 kg
(c) 7.00 kg (d) 7.40 kg

Q.45. The average score of a cricketer in his first 7 innings is 28 runs. His average score in the next 3 innings is 32 runs. Determine the score he should get in his 11th inning so that his overall average score becomes 33 runs.
Group D 27/09/2022 (Evening)
(a) 55 (b) 50 (c) 49 (d) 71

Q.46. The average of 7 numbers was given as 53. Later it was found that one number was misread as 16 instead of 58. What is the correct average of the given 7 numbers?
Group D 29/09/2022 (Evening)
(a) 52 (b) 55 (c) 59 (d) 56

Q.47. Vishnu purchased 8000 products for ₹1.2 each, another 3000 products for ₹1.5 each and another 5000 products for ₹1.4 each. Find the average cost per product. (Round the answer to two decimal places.)

Group D 29/09/2022 (Evening)
(a) ₹1.27 (b) ₹1.39 (c) ₹1.41 (d) ₹1.32

Q.48. A study centre has 5 classes with 50, 60, 25, 40 and 70 students. The pass percentage of these 5 classes are 20%, 25%, 20%, 10%, 30%, respectively. Find the average number of students per class in the centre who passed.
Group D 06/10/2022 (Evening)
(a) 10 (b) 12 (c) 11 (d) 55

Q.49. The mean of the first 7 prime numbers is :
Group D 11/10/2022 (Morning)
(a) $\frac{58}{7}$ (b) $\frac{63}{7}$ (c) $\frac{75}{7}$ (d) $\frac{50}{7}$

Q.50. A class consisting of 30 students took a competitive exam. 18 of these students got an average of 90 marks and the remaining students of this class got an average of 80 marks. What is the average score of the class as a whole?
Group D 11/10/2022 (Afternoon)
(a) 92 (b) 76 (c) 86 (d) 82

RRB NTPC CBT - 2 (09/05/2022 to 17/06/2022)

Q.51. The average of 30 numbers is 55. The average of the first 15 numbers is 51 and the average of the last 12 numbers is 56. What is the average of 68, 74 and the remaining 3 numbers?
Level 6 (09/05/2022) Shift 1
(a) 71 (b) 70 (c) 72.2 (d) 72

Q.52. Find the value of $\sqrt{2k + 11}$, where k is average of 16, 25, 13, 26 and 15.
Level 6 (09/05/2022) Shift 1
(a) 10 (b) 8 (c) 7 (d) 9

Q.53. The average of 25 numbers is 48.2. If the average of the first 10 numbers is 47 and the average of the last 12 numbers is 49, then find the average of 58, 69 and the remaining numbers.
Level 6 (09/05/2022) Shift 2
(a) 53.7 (b) 54.8 (c) 52 (d) 55.9

Q.54. A family spends Rs 4,600, Rs 5,600, Rs 4,800, Rs 3,800 and Rs 6,000 on groceries in the first 5 months of a year. How much should the family spend in the 6th month to make the 6 months average spending of the family on groceries to Rs 4,500?
Level 5 (12/06/2022) Shift 1
(a) 2,200 (b) 3,650 (c) 4,500 (d) 3,500

Q.55. Karisma has been spending ₹5,400 on the purchase of an item every year for the past three years. However, the price per unit of this item has fluctuated from year to year with the per unit price being ₹9 in the first year, ₹24 in the second year and ₹14.40 in the third year. What was the average per unit price that Karishma paid for this item in the three years ?
Level 5 (12/06/2022) Shift 2
(a) ₹14.10 (b) ₹13.50
(c) ₹12.90 (d) ₹13.80

Q.56. The average of two numbers is 46. Together with a third number, the combined average of three numbers changes to 43. What is the third number?
Level 5 (12/06/2022) Shift 2
(a) 40 (b) 35 (c) 37 (d) 38

Q.57. Sunidhi earned an average of ₹6,250 per month during the past 12 months. During the first 10 months her average earnings per month was ₹5,800. What was Sunidhi's average earnings per month during the last two months of the period?
Level 5 (12/06/2022) Shift 2
(a) ₹8,500 (b) ₹8,250
(c) ₹8,750 (d) ₹7,750

Q.58. The average of 38 numbers is 51. The average of the first 24 numbers is 45, and that of the last 5 numbers is 60. What is the average of the remaining numbers?
Level 3 (14/06/2022) Shift 2
(a) 59 (b) 60 (c) 62 (d) 61

Q.59. The average of five consecutive natural numbers is 12. What will be the average of the seven numbers if the next two natural numbers are also included?
Level 5 (15/06/2022) Shift 1
(a) 14 (b) 13 (c) 15 (d) 13.5

Q.60. A batsman scored 84 runs in his 12^{th} innings, thereby improving his average score per innings by 4 runs. What is the average score per innings of the batsman after the 12^{th} innings?
Level 5 (15/06/2022) Shift 1
(a) 44 (b) 40 (c) 42 (d) 36

Q.61. Find the average of 45% of 70 and 35% of 110.
Level 5 (15/06/2022) Shift 2
(a) 34.5 (b) 35 (c) 37.5 (d) 35.5

Q.62. Consider a sequence of seven consecutive numbers. If the average of the first five numbers is 'z' , then find the average of the last three numbers.
Level 2 (16/06/2022) Shift 2
(a) z + 5 (b) z + 1 (c) z + 7 (d) z + 3

Q.63. Team India scored runs in the first 30 overs in an ODI match at an average of 5.6 runs per over. What is the required runs per over in the remaining 20 overs at which the team has to score to meet a total target of 320?
Level 3 (17/06/2022) Shift 2
(a) 8.9 runs per over (b) 6.4 runs per over
(c) 7.6 runs per over (d) 4.6 runs per over

Q.64. Out of 60 students in a group, the ratio of the number of boys to that of girls is 2 : 1. If the average weight of boys is 50 kg and that of girls is 44 kg, then what is the average weight (in kg) of all the students in the group?
Level 3 (17/06/2022) Shift 2
(a) 48.25 (b) 47.5 (c) 49 (d) 48

RRB NTPC CBT - 1 (28/12/2020 to 31/07/2021)

Q.65. In a school the average age of boys and girls together is 16.8 years, the average age of boys is 15.4 years, and the average age of girls is 18.2 years.The ratio of number of boys to girls in the school is :
RRB NTPC 28/12/2020 (Evening)
(a) 2 : 3 (b) 1 : 1 (c) 3 : 2 (d) 3 : 5

Q.66. Out of three numbers, the first number is twice of the second and thrice of the third number. If the average of the three numbers is 880, what is the smallest number?
RRB NTPC 30/12/2020 (Evening)
(a) 480 (b) 840 (c) 460 (d) 420

Q.67. The average weight of P, Q and R is 58 kg. If the average weight of P and Q is 54 kg and that of Q and R is 48 kg, then the weight of Q is
RRB NTPC 04/01/2021 (Evening)
(a) 26 kg (b) 32 kg (c) 30 kg (d) 28 kg

Q.68. The captain of a cricket team of 11 members is 35 years old and the wicket keeper is 5 year older than the captain. If the ages of these two are excluded, the average age of the remaining players is three years less than the average age of the whole team. What is the average age of the whole team?
RRB NTPC 04/01/2021 (Evening)
(a) 24 years (b) 28 years
(c) 26 years (d) 25 years

Q.69. At present the average age of 20 students of class ten is 15.5 years. The present age of the class teacher is 47 years. What will be the average age of the students and the class teacher after 5 years?
RRB NTPC 08/01/2021 (Morning)
(a) 22 years (b) 21.8 years

(c) 21.5 years (d) 22.5 years

Q.70. The average weight of A, B, C and D is 56 kg. If the average weight of A, B and C is 52 kg and that of C and D is 48 kg. Then the weight of C is?
RRB NTPC 08/01/2021 (Evening)
(a) 30 kg (b) 36 kg (c) 28 kg (d) 34 kg

Q.71. The mean of ages of 9 children in a joint family is 14 years. The ages of their grandfather and grandmother are 71 years and 67 years respectively. Find the mean of the ages of children and grandparents.
RRB NTPC 09/01/2021 (Morning)
(a) 51 years (b) 24 years
(c) 25 years (d) 16 years

Q.72. The mean of ages of a group of 35 school students is 16 years. A 52 year old teacher joined the group. Find the mean of the ages of the students and the teacher.
RRB NTPC 11/01/2021 (Evening)
(a) 36 years (b) 34 years
(c) 43.5 years (d) 17 years

Q.73. If the sum of five consecutive numbers is 90, then what is the middle number ?
RRB NTPC 11/01/2021 (Evening)
(a) 16 (b) 19 (c) 18 (d) 17

Q.74. If the speeds of a train in 10 successive hours are a_1,a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9 and a_{10} then the average speed of the train is:
RRB NTPC 13/01/2021 (Morning)
(a) geometric mean of a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9, and a_{10}
(b) harmonic mean of a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9 and a_{10}
(c) median of a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9 and a_{10}
(d) arithmetic mean of a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9 and a_{10}

Q.75. As of this year, the average age of a family of 8 members is 39 years. Assuming that after six years the family adopts a new-born baby, what will be the average age of the family 10 years from now?
RRB NTPC 16/01/2021 (Evening)
(a) 46 years 8 Months
(b) 49 years
(c) 44 years
(d) 49 years 6 Months

Q.76. A rainfall of 0.896 cm was recorded in 7 h. What was the average amount of rain per hour?
RRB NTPC 19/01/2021 (Morning)
(a) 0.182 cm (b) 0.218 cm
(c) 0.128 cm (d) 0.112 cm

Q.77. The mean of 100 observations is 50. If one observation 50 is replaced by 150, then what will be the new mean?
RRB NTPC 19/01/2021 (Evening)
(a) 52 (b) 51 (c) 50.5 (d) 49.5

Q.78. The mean of 25 observations is 36. If the mean of its first 13 observations is 32 and the last 13 observations is 40, then what will be its 13th observation?
RRB NTPC 19/01/2021 (Evening)
(a) 38 (b) 36 (c) 23 (d) 40

Q.79. The mean of the first eight odd natural numbers is :
RRB NTPC 20/01/2021 (Morning)
(a) 9 (b) 11 (c) 8 (d) 10

Q.80. The average weight of an apple in a sample of 10 apples was calculated as 104 g. Later on, it was found that the weighing had shown the weight of each apple 20g less. The correct average weight of an apple in that sample is:
RRB NTPC 20/01/2021 (Morning)
(a) 200 g (b) 1240 g (c) 84 g (d) 124 g

Q.81. The mean of the first ten even natural numbers is:
RRB NTPC 20/01/2021 (Evening)
(a) 10 (b) 8 (c) 11 (d) 9

Q.82. The mean of the first twelve prime number is:
RRB NTPC 20/01/2021 (Evening)
(a) 16.42 (b) 12.00 (c) 20.45 (d) 10.50

Q.83. The marks obtained in a test by students of a class are given below:
23, 2, 15, 38, 21, 19, 24, 26 Scores of how many students are within a + 2 / - 2 range of the average score of the class?
RRB NTPC 21/01/2021 (Evening)
(a) 4 (b) 3 (c) 1 (d) 2

Q.84. If each entry of a piece of data is increased by 7, then the arithmetic mean:
RRB NTPC 22/01/2021 (Morning)
(a) remains the same (b) decreases by 7
(c) increases by 7 (d) increases by 49

Q.85. If the arithmetic mean of 16 , 18 , 15 , 17 , p and 14 is 17, then the value of p is:
RRB NTPC 22/01/2021 (Morning)
(a) 23 (b) 22 (c) 21 (d) 24

Q.86. Sonam was given some money to take care of her travel during a 15-day sales drive she had to undertake. However, she had to increase her stay by another 9 days and as a result her average daily travel allowance went down by Rs 75. What was the amount that was sanctioned to her in the beginning?
RRB NTPC 31/01/2021 (Morning)
(a) Rs 2,700 (b) Rs 3,000
(c) Rs 2,750 (d) Rs 2,850

Q.87. 18 years is the average age of 36 boys and their professor. The average becomes 17 years if we leave the professor out. What is the age (in years) of the professor ?
RRB NTPC 01/02/2021 (Morning)
(a) 34 (b) 44 (c) 64 (d) 54

Q.88. The average of 5 students in a class test is 39.20 and the average of three of them is 41. What is the average of the remaining two students ?
RRB NTPC 01/02/2021 (Evening)
(a) 39.5 (b) 37.5 (c) 36.5 (d) 38.5

Q.89. In a class of 100 students, the mean marks obtained in a certain subject is 25 and in another class of 50 students, the mean marks obtained in the same subject is 70.The mean marks obtained by the students of both the classes taken together is:
RRB NTPC 03/02/2021 (Morning)
(a) 30 (b) 60 (c) 40 (d) 25

Q.90. The average of four consecutive even integers is 27, what is the largest of these numbers ?
RRB NTPC 11/02/2021 (Evening)
(a) 27 (b) 96 (c) 30 (d) 24

Q.91. If the average of 6 positive integers is 45 and the difference between the largest and the smallest of these 6 numbers is 18, then what is the minimum value possible for the smallest of these 6 integers ?
RRB NTPC 17/02/2021 (Evening)
(a) 29 (b) 30 (c) 31 (d) 27

Q.92. The average salary of a husband and wife is Rs. 65,000 and the ratio of their salaries is 15 : 11 respectively. How much is the salary of the wife ?
RRB NTPC 03/03/2021 (Evening)
(a) Rs.55000 (b) Rs.75000
(c) Rs.27500 (d) Rs.32500

Q.93. What is the third number in a group of three numbers with a combined average of 29 , when the average of the other two numbers is 13 ?
RRB NTPC 05/03/2021 (Morning)
(a) 34 (b) 28 (c) 61 (d) 30

Q.94. The mean of three numbers is 53. The range of this data set is 28 while the difference between the two smallest numbers is 8. The greatest of the three

numbers is:
RRB NTPC 09/03/2021 (Evening)
(a) 72 (b) 71 (c) 73 (d) 69

Q.95. The average marks obtained by a group of 45 students were 16.2. One student left the group as a result of which the average of the remaining students rose to 16.5. But another student came in as a result of which the average marks of the group dropped a bit and became 16.4. What were the average marks obtained by the student who left and the one when joined?
RRB NTPC 12/03/2021 (Evening)
(a) 12 (b) 15 (c) 6 (d) 7.5

Q.96. Calculate the mean for following set of values- 2.2 , 4.2 , 6.4 , 8.3 , 10.5
RRB NTPC 15/03/2021 (Morning)
(a) 6.32 (b) 7 (c) 6.12 (d) 6.50

Q.97. If the average of 6 positive integers is 45 and the difference between the largest and the smallest of these 6 numbers is 18. What is the maximum value possible for the largest integer of these 6 integers?
RRB NTPC 19/03/2021 (Morning)
(a) 60 (b) 54 (c) 57 (d) 63

Q.98. The mean of the ages of three friends is 22. If the mean of the ages of four friends is 24, then find the age of the fourth friend.
RRB NTPC 27/03/2021 (Evening)
(a) 24 (b) 30 (c) 31 (d) 22

Q.99. The arithmetic mean of a set of 16 observations is 12. If 8 is subtracted from each of six numbers of these observations, then the new arithmetic mean is _____.
RRB NTPC 01/04/2021 (Evening)
(a) 11 (b) 9 (c) 10 (d) 15

Q.100. If the average of 6 positive integers is 55 and the difference between the largest and the smallest of these 6 numbers is 24, what is the maximum value possible for the largest of these 6 integers?
RRB NTPC 23/07/2021 (Morning)
(a) 81 (b) 75 (c) 78 (d) 72

Q.101. The average of 3 consecutive natural numbers (which are in increasing order) is K. If two more consecutive numbers, just next to the first set of numbers, are added, then the new average will become:
RRB NTPC 24/07/2021 (Evening)
(a) K + 1 (b) K + 2 (c) $\frac{2K+1}{2}$ (d) 2k - 1

Q.102. From every perfect square NOT exceeding 101, Rahul subtracts 5. What is the average of the numbers Rahul obtained?
RRB NTPC 26/07/2021 (Evening)
(a) 37.5 (b) 38 (c) 33.5 (d) -11.5

Q.103. Consider the average of any five consecutive odd natural numbers as p. If two more consecutive odd numbers, just next to the previous five numbers, are added, then the new average will become:
RRB NTPC 31/07/2021 (Morning)
(a) $\frac{2}{7}(p+1)$ (b) 2p + 1 (c) 2p - 3 (d) p + 2

RRB JE
(22/05/2019 to 28/06/2019)

Q.104. Out of 40 students, 15 are boys. In a test, the mean marks of the class is 75 and the average marks of the girls is 72. What is the average marks of boys ?
RRB JE 26/06/2019 (Evening)
(a) 80 (b) 76 (c) 74 (d) 82

RPF Constable
(17/01/2019 to 19/02/2019)

Q.105. The average of 5 numbers is 113, even after one number excluded the average remains the same. Find out the number dropped out of it.
RPF Constable 17/01/2019 (Morning)
(a) 119 (b) 117 (c) 115 (d) 113

Q.106. To win a competition, Swami needs an average of 80 marks in four exams. His marks in the first three exams are 68, 78 and 88. How many Marks should he get in the fourth test to win the competition?
RPF Constable 17/01/2019 (Morning)
(a) 86 (b) 90 (c) 88 (d) 84

Q.107. 5 numbers have an average of 126. The average does not change even after a number is excluded. What is the value of the excluded number?
RPF Constable 17/01/2019 (Evening)
(a) 126 (b) 123 (c) 124 (d) 125

Q.108. In order to qualify for a competition, Haumi will have to score an average of 80 marks in four examinations. She got 81, 91 and 66 marks in the first three examinations. How many marks will she have to score in the fourth test to qualify for the competition?
RPF Constable 17/01/2019 (Evening)
(a) 84 (b) 85 (c) 82 (d) 83

Q.109. To win a competition, Swami needs an average of 80 marks in four exams. Her marks in the first three examinations are 74, 84 and 94. How many marks should he get in the fourth test to win the competition?
RPF Constable 18/01/2019 (Afternoon)
(a) 72 (b) 66 (c) 68 (d) 74

Q.110. The average of 5 numbers is 119, one number is removed from the group but the average remains the same. Find out the removed number .
RPF Constable 18/01/2019 (Afternoon)
(a) 116 (b) 117 (c) 119 (d) 118

Q.111. In order to succeed in a competition, Somi needs an average score of 80 in four exams. His score in the first three examinations is 71,81 and 91. How many scores should he get in the fourth test to succeed in the competition?
RPF Constable 18/01/2019 (Evening)
(a) 77 (b) 99 (c) 88 (d) 66

Q.112. The average of 7 numbers is 75. After removing any one number, the average remains the same. Find out the deleted numbers.
RPF Constable 19/01/2019 (Morning)
(a) 73 (b) 71 (c) 77 (d) 75

Q.113. The expenditure of a company was Rs.43500 during the first quarter of the financial year, Rs.46500 during the second quarter of the financial year and during the third quarter of the financial year was Rs.57600. If the average quarterly expenditure during the entire financial year is Rs.5, 4075, then find out the expenditure for the last quarter of the financial year. (In rupees)
RPF Constable 19/01/2019 (Morning)
(a) 64800 (b) 67600
(c) 68700 (d) 68400

RPF S.I.
(19/12/2018 to 16/01/2019)

Q.114. A gift box contains 10 bracelets. The average weight of the first 4 rings is 30 gm and the average weight of the remaining 6 rings is 31 gm. Find the total average weight (in gm) of all the rings.
RPF S.I. 19/12/2018 (Morning)
(a) 30 (b) 31.6 (c) 31 (d) 30.6

Q.115. Dravid distributes 350 gifts among 4 children. The number of gifts received by the first child, double the number of gifts received by the second child, thrice the number of gifts received by the third child and four times the

number of gifts received by the fourth child . How many gifts did the first child receive?
RPF S.I. 19/12/2018 (Morning)
(a) 168 (b) 326 (c) 128 (d) 224

Q.116. An English company based on a subsidiary project has 505 male and 505 female workers. The average productivity of all the employees is 55 calls/day. If a male worker receives 55 calls/day, then what will be the number of calls received by female workers per day?
RPF S.I. 19/12/2018 (Morning)
(a) 55 (b) 51 (c) 57 (d) 53

Q.117. A gift box contains 10 bracelets. The average weight of the first 4 bracelets is 33 grams and the average weight of the remaining 6 bracelets is 34 grams. Find the total average weight (in grams) of all the bracelets?
RPF S.I. 19/12/2018 (Evening)
(a) 33.6 (b) 33.4 (c) 33 (d) 34

Q.118. The average weight of 97 notebooks kept in a box is 9.7 kg. By adding 1 more notebook to the box, its average weight becomes 9.8 kg. Find the weight of the new notebook?
RPF S.I. 19/12/2018 (Evening)
(a) 18.7kg (b)19.5kg (c)19.1kg (d)18.3 kg

Q.119. A gift box has 10 bangles. The average weight of the first 4 bangles is 57 gms and the average weight of the remaining 6 bangles is 58 gms. Tell the average weight of all bangles | (in grams)
RPF S.I. 05/01/2019 (Morning)
(a) 57.4 (b) 57.2 (c) 57.6 (d) 57.8

Q.120. There is 10 rings in a gift box. The average weight of the first 4 rings is 39 grams and the remaining 6 rings have an average weight of 40 grams. Get the average weight of the total rings. (in gm)
RPF S.I. 06/01/2019 (Morning)
(a) 39.4 (b) 39.2 (c) 39.6 (d) 39.8

Q.121. In a support project of an English based company, there are 513 male and 513 female employees.The average productivity of all employees is 63 calls per day. The average call organized by the male employee is 63 calls per day. What is the average call per day by female employees?
RPF S.I. 06/01/2019 (Morning)
(a) 63 (b) 61 (c) 67 (d) 65

Q.122. There are 10 bangles in a gift box, the first four bangles have an average weight of 47 grams and the remaining 6 bangles have an average weight of 48 grams. Find the average weight of the total bangles. (In grams)
RPF S.I. 06/01/2019 (Afternoon)
(a) 47.6 (b) 45.6 (c) 46.6 (d) 48.6

Q.123. A gift box has 10 bangles. The average weight of the first four bangles is 49 gms and the remaining weight of the 6 bangles is 50 gms. Tell the average weight of all bangles. (in grams)
RPF S.I. 10/01/2019 (Morning)
(a) 49.6 (b) 49.4 (c) 49.7 (d) 49.5

Q.124. The average weight of 63 notebooks kept in a box is 6.3 kg. When a new notebook is placed in the box then the average is 6.4kg. Specify the weight of the new notebook. (In Kg)
RPF S.I. 10/01/2019 (Morning)
(a) 12.7 (b) 12.5 (c) 12.1 (d) 12.3

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.125. The mean score in a test of the 10 boys in a class was 15 while the overall mean of the 25 students in the class was 16.2. What was the mean score of the girls?
RRB ALP 13/08/2018 (Morning)
(a) 16.8 (b) 17 (c) 17.5 (d) 16.5

Q.126. Samit was given some money to take care of his travel during a 6-day sales drive he had to undertake. However, he had to increase his stay by another 4 days and as a result his average daily travel allowance went down by ₹ 56. What was the amount that was sanctioned to him in the beginning?
RRB ALP 13/08/2018 (Morning)
(a) ₹420 (b) ₹336 (c) ₹840 (d) ₹560

Q.127. The average of three numbers is 6. The average of the first two is 5 while the average of the last two is 8. The three numbers are:
RRB ALP 13/08/2018 (Afternoon)
(a) 2, 7, 9 (b) 2, 6, 10 (c) 2, 8, 8 (d) 3, 7, 8

Q.128. There was a group of six students who took a test. Another student joined the group after taking the test later. With her marks included the average score of the group went up by 3. This student has got _____ marks more than the average marks without her being included.
RRB ALP 13/08/2018 (Evening)
(a) 21 (b) 20 (c) 18 (d) 24

Q.129. What is the mean of first hundred natural numbers?
RRB ALP 14/08/2018 (Afternoon)
(a) 50 (b) 51.5 (c) 50.5 (d) 51

Q.130. Four numbers A, B, C and D are such that their overall average is 16. The average of A and B is 9.5. The average of C and D is:
RRB ALP 17/08/2018 (Morning)
(a) 22.5 (b) 23 (c) 25.5 (d) 21.5

Q.131. The mean score in a test of the 12 boys in a class was 16 while the overall mean score of the 30 students in the class was 18.1. What was the mean score of the girls?
RRB ALP 20/08/2018 (Morning)
(a) 20.5 (b) 19.8 (c) 19.5 (d) 20

Q.132. Mean temperature of a city for a week is 28°C. If the mean temperature for Monday, Tuesday, Wednesday and Thursday is 27.5°C and the mean temperature for Thursday, Friday, Saturday and Sunday is 29°C, the temperature recorded for Thursday is.
RRB ALP 29/08/2018 (Evening)
(a) 30°C (b) 29°C (c) 31°C (d) 28°C

Q.133. In a class when a test is conducted, mean of 25 students marks is 60.if mean of first 13 students marks is 70 and mean of last 13 students marks is 50 find the marks of the middle student when arranged in the ascending order.
RRB ALP 30/08/2018 (Morning)
(a) 40 (b) 70 (c) 60 (d) 50

Q.134. The mean of the 5 smallest numbers from a group is 15 while the mean of all the 13 members of the group taken together is 17. What is the mean of the 8 largest numbers?
RRB ALP 30/08/2018 (Morning)
(a) 18.50 (b) 18.25 (c) 17.75 (d) 18 75

Q.135. The average marks obtained by a group of 16 students was 20. One student left the group as a result of which the average of the remaining students rose to 21. But another student joined, as a result of which the average marks of the group dropped a bit and became 20.5. What was the average marks obtained by the student who left and the one who joined?
RRB ALP 31/08/2018 (Evening)
(a) 9 (b) 10 (c) 8 (d) 11

Answer Key :-

1.(d)	2.(c)	3.(c)	4.(d)
5.(d)	6.(a)	7.(d)	8.(a)
9.(b)	10.(a)	11.(d)	12.(a)
13.(d)	14.(b)	15.(b)	16.(d)

17.(d)	18.(c)	19.(a)	20.(d)
21.(c)	22.(a)	23.(c)	24.(b)
25.(c)	26.(d)	27.(b)	28.(d)
29.(a)	30.(d)	31.(b)	32.(b)
33.(a)	34.(b)	35.(b)	36.(a)
37.(b)	38.(d)	39.(b)	40.(b)
41.(d)	42.(d)	43.(d)	44.(c)
45.(d)	46.(c)	47.(d)	48.(c)
49.(a)	50.(c)	51.(a)	52.(c)
53.(b)	54.(a)	55.(b)	56.(c)
57.(a)	58.(c)	59.(b)	60.(b)
61.(b)	62.(d)	63.(c)	64.(d)
65.(b)	66.(a)	67.(c)	68.(a)
69.(a)	70.(c)	71.(b)	72.(d)
73.(c)	74.(d)	75.(c)	76.(c)
77.(b)	78.(b)	79.(c)	80.(d)
81.(c)	82.(a)	83.(b)	84.(c)
85.(b)	86.(b)	87.(d)	88.(c)
89.(c)	90.(c)	91.(b)	92.(a)
93.(c)	94.(d)	95.(d)	96.(a)
97.(a)	98.(b)	99.(b)	100.(b)
101.(a)	102.(c)	103.(d)	104.(a)
105.(d)	106.(a)	107.(a)	108.(c)
109.(c)	110.(c)	111.(a)	112.(d)
113.(c)	114.(d)	115.(a)	116.(a)
117.(a)	118.(b)	119.(c)	120.(c)
121.(a)	122.(a)	123.(a)	124.(a)
125.(b)	126.(c)	127.(c)	128.(a)
129.(c)	130.(a)	131.(c)	132.(a)
133.(c)	134.(b)	135.(a)	

Solution:-

Sol.1.(d) The average of 11 numbers = 41
The sum of the all 11 numbers
= 11 × 41 = 451
The sum of the first five numbers
= 18 × 5 = 90
The sum of the last five numbers
= 64 × 5 = 320
Hence, the sixth number
= 451 - (90 + 320) = 451 - 410 = 41

Sol.2.(c) Let the group contain x people.
Number of men = $\frac{2x}{5}$
$and\ number\ of\ women\ = \frac{7x}{20}$
Number of children = $x - \frac{2x}{5} - \frac{7x}{20} = \frac{x}{4}$
Now, Men : Women : Children = $\frac{2}{5} : \frac{7}{20}$: $\frac{1}{4} = 8 : 7 : 5$
Now, Total average of the group
= $\frac{8 \times 70 + 7 \times 60 + 5 \times 30}{20}$
= $\frac{1130}{20} = 56.5\ kg$

Sol.3.(c) Number of seats in three 4 - seater cars = 12 seats
Total earning from 3 cars
= 12 × 25 = ₹300
Number of seats in two 8-seater maxi
= 16 seats
Total earning from 2 maxi
= 16 × 20 = ₹320
Average earning
= $\frac{300 + 320}{3 + 2} = \frac{620}{5}$ = ₹124

Sol.4.(d) Average earning of Raghav in first three months = ₹45000
So earning in april= 45000 × $\frac{4}{3}$
= ₹60000
Let the average earning of Raghav May to December = X
ATQ,
$\frac{45000 \times 3 + 60000 + 8X}{12}$ = ₹45300
195000 + 8X = ₹543600
8X = ₹348600
So, X = ₹43575

Sol.5.(d) Sum of the 10 observations
= 10 × 46 = 460
Now, due to misread, 142 written as 42.
So, correct average
= $\frac{460 + 100}{10} = \frac{560}{10}$ = 56

Sol.6.(a)
Let the number of children be X
So total weight
⇒ 4 5 × x - 420 + 110 = (x - 8) × (45 + $\frac{5}{4}$)
⇒ 45x - 310 = 45x - 360 + $\frac{5}{4}$ x - 10
⇒ $\frac{5}{4}$x = 60 so ⇒ x = 48 students

Sol.7.(d) New average = 28
Old average = 28 $- 8 = 20$
Now,
$20 \times 9 + X = 28 \times 100$
$X = 100$

Sol.8.(a) Let there be "n" students
Increased marks due to the wrong entry
= 99 - 9 = 90
ATQ , $\frac{90}{2.25}$ = n ⇒ n = 40

Sol.9.(b)
The sum of remaining 4 numbers
= (25 × 55) - (11 × 51) - (10 × 56) = 254
Required average = $\frac{254 + 66 + 70}{6} = 65$

Sol.10.(a) Total amount spending
= 1475 × 4 = ₹5900
Amount spent on first 3 weeks
= 1200 + 1500 + 1875 = ₹4575
Money spent on last week
= 5900 - 4575 = ₹1,325

Sol.11.(d)
Let the total number of staff = x
3560 × x = 5400 × 12 + 2600 × (x - 12)
⇒ 356 x = 540 × 12 + 260x - 260 × 12
⇒ 96 x = 12 × (540 - 260)
⇒ x = $\frac{(12 \times 280)}{96}$ ⇒ x = 35
the number of non-officers in the office
= 35 - 12 = 23

Sol.12.(a) First 5 composite numbers
= 4, 6, 8, 9 and 10.
Mean of first 5 composite numbers
= $\frac{4 + 6 + 8 + 9 + 10}{5} = \frac{37}{5}$
First 5 prime numbers are
= 2, 3, 5, 7 and 11.
Mean of first 5 prime numbers are
= $\frac{2 + 3 + 5 + 7 + 11}{5} = \frac{28}{5}$
So, the difference between the mean of first 5 composite numbers and the mean of the first five prime numbers is
= $\frac{37}{5} - \frac{28}{5} = \frac{9}{5} = 1.8$

Sol.13.(d) Given that average of a_1 , a_2 and a_3 is equal to average of a_2 , a_3 and a_4
so, $a_1 + a_2 + a_3 = a_2 + a_3 + a_4$ ⇒ $a_1 = a_4$
So, a_4 = 21 (given that a_1 = 21)

Sol.14.(b) Let Per day expense = x
After decrease daily expense = x - 80
A/Q ,
Initial expense = final expense
16x = 24(x - 80)
⇒ 16 x = 24x - 1920
⇒ 8x = 1920
Initial amount = 16x = Rs 3,840
Alternate Method:
Concept: If amount is fix then , days and daily expenses are inversely proportional

	Initial		final
Ratio of days:	2	:	3
Ratio of expense	3	:	2

Reduction in expense is 1 unit = 80 rs
so Initial expenses is 3 unit = 240 Rs per day so
Amount = 16days x Rs 240 = Rs 3840

Sol.15.(b) Sum of marks of 25 students
= 25 × $36 = 900$
When a student left, the sum of remaining students = 24 × $37.5 = 900$
∴ marks of the student who left

= 900 - 900 = 0
After joining a new student sum of marks
$= 25 \times 37.2 = 930$
∴ marks of the student who joined
= 930 - 900 = 30
Average marks of the student who left and who joined = $\frac{0+30}{2} = 15$

Sol.16.(d) Coefficient of variance
$= \frac{S.D}{Mean} \times 100 = \frac{5}{14} \times 100$
= 35.71% ≅ 35.7 %

Sol.17.(d) Let the no of girls be x
ATQ , $\frac{9 \times 12 + x \times 14}{x+9}$ = 13.1
108 + 14x = 13.1(x + 9)
108 + 14x = 13.1x + 117.9
0.9x = 9.9 ⇒ x = 11
So, the total no of students = 11 + 9 = 20

Sol.18.(c) Total score of batsman for 10 innings =10 × 52 = 520
Total score of batsman for 12 innings
= 54 × 12 =648
Toatl score of batsman for 11th and 12th innings = 648 - 520 = 128
ATQ,
11th innings = x , and 12th innings
= x + 16 Now, x + 16 + x = 128 ⇒ So, x = 56

Sol.19.(a) Marks obtained by student who left the group
= 20 – (21 – 20) × 9 = 20 – 9 = 11
Marks obtained by student who join the group = 20.6 – (21 – 20.6) × 9
= 20.6 – 3.6 = 17
Average marks of the student who left and who joined = $\frac{11+17}{2} = \frac{28}{2}$ = 14

Sol.20.(d) expenditure of company in 1st quarter of financial year = 32400
expenditure of company in 2nd quarter of financial year = 21600
expenditure of company in 3rd quarter of financial year = 79200
Total expenditure till 9 month = 32400 + 21600 +79200 = 133200
According to question,
Total expenditure in given financial year = 50400 × 4 = 201600
expenditure of company in last quarter of financial year = 201600 - 133200 = 68400

Short Tricks :-

1st qtr.	2nd qtr.	3rd qtr.	4th qtr.
↓	↓	↓	↓
32400	21600	79200	x

Overall quarterly avg. ⟶ 50400

+18000 +28800 -28800

(50400+18000+28800-28800) = 68400

Sol.21.(c)
Average mark obtained by dinesh = $\frac{\text{mark obtained in all subjects}}{\text{sum of maximum mark in all subjects}}$
$\Rightarrow \frac{68+78+48+28}{300} \times 100$
$= \frac{222}{3}\%$ = 74%

Sol.22.(a) Let , the average call receive by female employees be x
Then,
1258 × 72 = 629 × 72 + 629 × x ⇒ x = 72

Sol.23.(c)
Average score of 30 students
$= \frac{12 \times 80 + 18 \times 75}{30} = \frac{960+1350}{30}$
$= \frac{2310}{30} = 77$

Sol.24(b) Average
$= \frac{11(1+2+3+4+5+6+7.....12)}{12}$
$= \frac{11 \times 12 \times 13}{2 \times 12} = \frac{143}{2} = 71.5$

Sol.25.(c)
Let the first consecutive integer be x.
$x + x + 1 + x + 2 + \ldots\ldots\ldots\ldots + x + 12 = 36 \times 13$
$\Rightarrow 13x + 78 = 468$
$\Rightarrow 13x = 468 - 78$
$\Rightarrow 13x = 390 \Rightarrow x = 30$
Smallest integer = 30 , largest integer = 30 + 12 = 42
Required sum = 2 × 30 + 42
= 60 + 42 = 102

Sol.26.(d)
Let the first even number be x.
$\frac{x+x+2+x+4+x+6+x+8}{5} = 10$
$\Rightarrow 5x + 20 = 50$
$\Rightarrow 5x = 50 - 20 \Rightarrow 5x = 30 \Rightarrow x = 6$
Arranging in ascending order,
6 , 8 , 10 , 12 , 14
So, 10 is at the centre.
Short trick :-
Consecutive even numbers are in arithmetic progression with difference 2.
Average of A.P. = middle term
Middle term = 10 = term at the center

Sol.27.(b) $\frac{92+53+35+x+27}{5} = 43$
$\Rightarrow 207 + x = 215$
$\Rightarrow x = 215 - 207 = 8$

Sol.28.(d) Let the other number be x.
$\frac{12+x}{2} = 26$
$\Rightarrow 12 + x = 52 \Rightarrow x = 52 - 12 = 40$

Sol.29.(a) The change in each number of a group leads to the same change in average of the group.
Then, the changed average = 40 × 20 = 800

Sol.30.(d) Average weight of whole class
$= \frac{40 \times 36 + 50 \times 45}{40+50} = \frac{3690}{90} = 41\ kg$

Sol.31.(b) Annual income of Krishna
= 45,000 × 12 = ₹5,40,000
And annual expenditure of Krishna
= ₹4,20,000
Therefore average savings per months of Krishna = $\frac{540000-420000}{12}$
$\Rightarrow \frac{120000}{12}$ = ₹10,000

Sol.32.(b)
There are 31 days in the month of March,
So, Total number of cars sold in the month of March = 31 × 130 = 4030
Since, First saturday was on 3rd march,
Number of Saturdays (5)
= 3, 10, 17, 24, 31
Number of Sundays (4) = 4, 11, 18, 25
Number of cars sold in March except Sundays and Saturdays
= 22 × 125 = 2750
Number of cars sold on Sundays
= 4 × 150 = 600
Remaining cars which are sold on Saturdays = 4030 - (2750 + 600) = 680
So, Average sale of cars on Saturdays
$= \frac{680}{5} = 136$

Sol.33.(a) Total amount spent on group A = 20 × 120 = ₹2400
Total amount spent on group B
= 32 × 125 = ₹4000
Total amount spent on group C
= 28 × 100 = ₹2800
Average amount spent per member
$= \frac{2400+4000+2800}{80} = \frac{9200}{80} = ₹115$
Short trick:-
Let Avg. = 120

	A	:	B	:	C
no. =	20		32		28
=	5	:	8	:	7
avg.=	120		125		100

Net deviation = (0 × 5) + (5 × 8) + (- 20 × 7) = + 40 - 140 = - 100
Avg. = 120 - $\frac{100}{20}$ = 115

Sol.34.(b)
Let the average of whole class = x
a/c to question ;
60 × 8 + 12 × 40 = 960
average of whole class(x) = $\frac{960}{20}$ = 48

Sol.35.(b)
Prime numbers between 11 and 30
⇒ 13 , 17, 19 , 23, 29
Therefore average of the numbers

$= \frac{13+17+19+23+29}{5} = 20.2$

Sol.36.(a)
Sum of 41 numbers = 41 × 62 = 2542
Sum of first 18 numbers= 18 × 65.5 = 1179
Sum of last 24 numbers = 24 × 61.5 = 1476
So, 18th number
= (1476 + 1179) - 2542 = 113
Therefore average of remaining 40 number = $\frac{2542-113}{40}$ = 60.725

Sol.37.(b) $Average\ of\ 3^2, 4^2, 5^2, 6^2$ and 7^2
$= \frac{9+16+25+36+49}{5} = \frac{135}{5} = 27$

Sol.38.(d) The average of the first 35 natural numbers = $\frac{n+1}{2} = \frac{36}{2} = 18$

Sol.39.(b)
Let the weight of the new person be x kg
Total increased weight = 6 × 2 = 12
Hence, the weight of the new person (x)
= 72 + 12 = 84 kg

Sol.40.(b)
Sum of the weight of 32 parcels
= 32 × 96 = 3072
New average after 1 more parcel
= 33 × 98 = 3234
Hence, the weight of the new parcel
= 3234 - 3072 = 162 kg
Short trick :-

Parcels : Average
32 96 kg
+1 parcel +2 kg
33 98

the weight of the new parcel
= 96 kg + (+ 2 × 33) = 162 kg

Sol.41.(d)
Average weight of 11 students = 50 kg
Total sum of the weight of 11 students
= 11 × 50 = 550 kg
Now, new average after teacher's weight is added = $\frac{550+70}{12} = \frac{620}{12} = 51.66$

Sol.42.(d) The average score of a cricketer for 10 matches = 40 runs
Then the sum of the scores for 10 matches = 400 runs
Average of first 6 matches = 44
Sum of the scores of 6 matches
= 44 × 6 = 264
Average of last four matches
$= \frac{400-264}{4} = \frac{136}{4} = 34$

Sol.43.(d)
Let the total members in club be x
Then, number of men = $\frac{4x}{5}$ and number of women = $\frac{x}{5}$
Sum of the ages of all men
$= \frac{4x}{5} \times 30 = 24x$
Sum of the ages of all women = $\frac{x}{5} \times 40 = 8x$
The combined average age of all the members = $\frac{24x+8x}{x} = 32$

Sol.44.(c) Total weight of 18 jackfruits
= 7.2 × 18 = 129.6
When two more jackfruits are added then new average = 7.2 - 0.02 = 7.18
Total weight of 20 jackfruits
= 7.18 × 20 = 143.6
Weight of the each jackfruit added
$= \frac{143.6-129.6}{2} = 7.00\ kg$

Sol.45.(d) Total score in first 7 innings
= 28 × 7 = 196
Total score in next 3 innings = 32 × 3 = 96
Overall score in 11 innings = 33 × 11 = 363
Now, score in 11th innings
= 363 - (196 + 96) = 71

Sol.46.(c)
Incorrect Average of 7 numbers = 53
Actual sum of 7 numbers
$= 7 \times 53 + (58 - 16) = 413$
Correct average = $\frac{413}{7}$ = 59

Sol.47.(d) Average cost per product =
$\frac{8000 \times 1.2 + 3000 \times 1.5 + 5000 \times 1.4}{8000+3000+5000}$
= 1.318 or 1.32

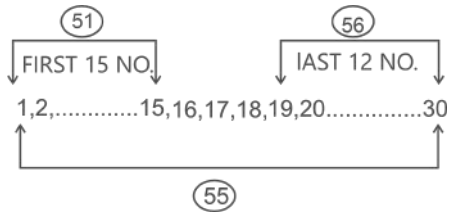
Sol.48.(c) Number of passed students in 1st class = 50 × $\frac{20}{100}$ = 10
Number of passed students in 2nd class
= 60 × $\frac{25}{100}$ = 15
Number of passed students in 3rd class
= 25 × $\frac{20}{100}$ = 5
Number of passed students in 4th class
= 40 × $\frac{10}{100}$ = 4
Number of passed students in 5th class
= 70 × $\frac{30}{100}$ = 21
Average number of students per class =
$\frac{10+15+5+4+21}{5}$ = 11

Sol.49.(a)
First 7 prime numbers = 2, 3, 5, 7, 11, 13, 17
Mean = $\frac{2+3+5+7+11+13+17}{7} = \frac{58}{7}$

Sol.50.(c) Sum of marks of 18 students
= 18 × 90 = 1620
Sum of marks of remaining students
= 12 × 80 = 960
Average score of whole class
= $\frac{1620+960}{30}$ = 86

Sol.51.(a)
Sum of 30 numbers = 30 × 55 = 1650
Sum of first 15 numbers = 51 × 15 = 765
Sum of last 12 numbers = 56 × 12 = 672
So, sum of remaining three numbers = 1650 – (765 + 672) = 1650 – 1437 = 213
Required average = $\frac{213+68+74}{5}$
= $\frac{355}{5}$ = 71

Short Tricks :-



From 1 ... 15 ⇒ Variation
= (55 - 51) × 15 = 60
Last 12 number ⇒ Variation
= (55 - 56) × 12 = - 12
Total variation = + 48
sum of 16th , 17th and 18th no.
= 55 × 3 + 48 = 213
Required average = $\frac{68+74+213}{5}$ = 71

Sol.52.(c) According to the question,
k = $\frac{16+25+13+26+15}{5} = \frac{95}{5}$ = 19
So, $\sqrt{2k+11} = \sqrt{2(19)+11}$
$= \sqrt{38+11} = \sqrt{49} = 7$

Sol.53.(b)

25	=	10	+	12	+	3
↓		↓		↓		↓
48.2		47		49		x

25 × (48.2 - 48.2)
= 10 × (47 - 48.2) + 12 × (49 - 48.2) + 3x
0 = - 12 + 9.6 + 3x
3x = 2.4 ⇒ x = 0.8
Average of three numbers = 48.2 + 0.8 = 49
Required average = $\frac{58+69+49\times3}{5}$
= $\frac{274}{5}$ = 54.8

Sol.54.(a) Total spends in 5 months
= 4600 + 5600 + 4800 + 3800 + 6000
= 24800
Sum of spending in 6 months
= 4500 × 6 = 27,000
Spending in 6 months
= 27000 - 24800 = 2200

Sol.55.(b)
Total spending in 3 years = 5400 × 3
= 16,200

Number of unit in 1st year = $\frac{5400}{9}$ = 600

Number of unit in 2nd year = $\frac{5400}{24}$ = 225

Number of unit in 3rd year = $\frac{5400}{14.40}$ = 375

Average price = $\frac{16,200}{600+225+375}$ = 13.50

Sol.56.(c) Sum of two number
= 2 × 46 = 92
Sum of three number = 3 × 43 = 129
Third number = 129 - 92 = 37

Sol.57.(a) Total earning in 12 months
= 6250 × 12 = 75,000
Total earning in 10 months
= 5800 × 10 = 58,000
Earnings in 2 months
= 75,000 - 58,000 = 17,000
Average = $\frac{17,000}{2}$ = ₹8,500

Sol.58.(c)
Sum of the 38 numbers = 38 × 51 = 1938
Sum of the first 24 numbers = 24 × 45
= 1080
Sum of last 5 numbers = 5 × 60 = 300
Sum of remaining number
= 1938 - 1080 - 300 = 558
Average of remaining 9 numbers
= $\frac{558}{9}$ = 62

Sol.59.(b) Average five consecutive natural numbers = 12
We know,
Average is nothing but the middle number
So, Numbers = 10, 11, **12**, 13, 14
If next 2 is also included, then Average
= 10, 11, 12, **13**, 14, 15, 16 = 13

Sol.60.(b) Let the average score of the batsman be A.
Total sum of runs in 11 innings = 11A
ATQ, $\frac{11A+84}{12}$ = A + 4 ⇒ A = 36
So, The average score after 12th innings = 36 + 4 = 40

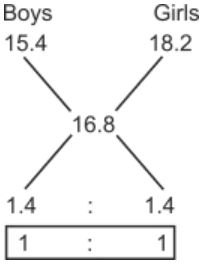
Sol.61.(b) 45% of 70 =
$31.5 \ and \ 35\% \ of \ 110 = 38.5$
Average = $\frac{31.5+38.5}{2} = 35$

Sol.62.(d)
$\frac{x+x+1+x+2+x+3+x+4}{5} = Z$
$\Rightarrow x = \frac{5z-10}{5} = Z-2$
Average of last three numbers=
$\frac{x+4+x+5+x+6}{3} = \frac{3x+15}{3}$
$= x+5 = Z-2+5 = Z+3.$

Sol.63.(c) Runs scored in first 30 overs
= 5.6 × 30 = 168 runs
Required run rate = $\frac{320-168}{20} = \frac{152}{20}$
$= 7.6 \ runs \ per \ over$

Sol.64.(d) Let the number of boys and girls be 2x, x
2x + x = 60 ⇒ $3x = 60 \Rightarrow x = 20$
So, Number of boys = 20 × 2 = 40 , and number of girls = 20
Total average of weights of all 60 students = $\frac{40\times50+20\times44}{60}$
$= \frac{2880}{60} = 48$

Sol.65.(b) The average age of boys and girls in a school is 16.8 years,
The average age of boys is 15.4 years and that of girls is 18.2 years.
Then the ratio of the number of boys and girls in the school is,
⇒ $B : G = \frac{(16.8-15.4)}{(18.2-16.8)}$ = 1 : 1
Short Tricks :-
Average age of all students
= $\frac{total \ sum \ of \ ages \ of \ all \ students}{no. \ of \ total \ students}$
When we do allegation on average age of all students then we get the ratio of no. of students:-



Sol.66.(a) Out of three numbers, the first number(a) is twice the second(b) and thrice of the third number(c).
Then the ratio of a : b : c = 6 : 3 : 2
ATQ, $\frac{6+3+2}{3}$ units → 880
⇒1 unit = 240
So, the three numbers are
a = 6 × 240 = 1440,
b = 3 × 240 = 720
and c = 2 × 240 = 480
and the smallest number is 480.

Sol.67.(c) Sum of weight of
P, Q, R = 3 × 58 = 174 kg
Sum of weight of P and Q = 2 × 54 = 108 kg
Sum of weight of Q and R = 2 × 48 = 96 kg Weight of Q = (108 + 96) - 174
= 204 - 174 = 30 kg.

Sol.68.(a) Age of captain = 35 years
Age of wicket keeper = 40 years
Let the average age of whole team
= x years
ATQ, ⇒ 11x = 9(x - 3) + 35 + 40
⇒ 11x = 9x - 27 + 75 ⇒ 2x = 48
⇒ x = 24 years.

Sol.69.(a) Sum of ages of all students
= 20 × 15.5 = 310
Age of teacher = 47
Average = $\frac{310+47}{21}$ = 17
Average after 5 year = 17 + 5 = 22

Sol.70.(c) Sum of weight of A, B, C and D
= 56 × 4 = 224 kg
Sum of weight of A, B and C
= 52 × 3 = 156 kg
∴ weight of D = 224 - 156 = 68 kg
Sum of weight of C and D = 2 × 48 = 96 kg
∴ weight of C = 96 - 68 = 28 kg

Sol.71.(b) The mean age of 9 children in a joint family is 14 years.
So the total ages of the 9 children
= 14 × 9 = 126,
Then, the total ages of all the children and grandparents = 126 + 71 + 67 = 264,
So, the mean of the ages of children and grandparents = $\frac{264}{11} = 24$

Sol.72.(d) Sum of ages of students
= 35 × 16 = 560
Mean of students and teacher's age
= $\frac{560+52}{36}$ = $\frac{612}{36}$ = 17 years

Sol.73.(c) Let the numbers
= x - 2, x - 1, x, x + 1, x + 2
A/Q , (x - 2) + (x - 1) + x + (x + 1) + (x + 2)
= 90 ⇒ 5x = 90 ⇒ x = 18 (Middle no.)
Short tricks:- The middle no. will be the average = $\frac{90}{5}$ = 18

Sol.74.(d) The average speed of the train is the arithmetic mean of all speeds.

Sol.75.(c) sum of present ages of family members = 8 × 39 = 312
after 6 years sum of age
= 45 × 8 = 360
Then after 10 year
Average age of total family member
= $\frac{49\times8+4}{9}$ = 44yr.

Sol.76.(c) Recorded rainfall of in 7 h
= 0.896 cm
The average amount of rain per hour
= 0.896 ÷ 7 = 0.128

Sol.77.(b) Given that, the mean of 100 observations = 50
So, their sum = 50 × 100 = 5000
According to the question,
New mean

$= \frac{5000 - 50 + 150}{100} = \frac{5100}{100} = 51$

Sol.78.(b) Given that, The mean of 25 observations is 36.
If the mean of its first 13 observations is 32 and the last 13 observations is 40.
Sum of 25 observations = 36 × 25 = 900
Sum of first 13 observations
= 32 × 13 = 416
Sum of Last 13 observations
= 40 × 13 = 520
Sum of first 13 observations + Sum of last 13 observations − 13th observation = Total sum of 25 observations
416 + 520 − 13th observation = 900
13th observation = 36

Sol.79.(c) The mean of the first eight odd natural numbers is :
$= \frac{1+3+5+7+9+11+13+15}{8} = 8$

Sol.80.(d)
Average of 10 Apples is 104gm.
Here Weighing(Weighing machine) had shown 20gm less weight of each Apple.
So, for the correct average we have to add 20gm.
Now, the correct average will be
= (104 + 20) = 124 g

Sol.81.(c)
Sum of 1st ten even natural numbers
$= 10 \times 11 = 110$
Mean = $\frac{110}{10}$ = 11

Sol.82.(a)
Sum of 1st twelve prime number
= 2 + 3 + 5 + 7 + 11 + 13 + 17 + 19 + 23 + 29 + 31 + 37 = 197
Mean = $\frac{197}{12} = 16.416 \cong 16.42$

Sol.83.(b) Average of the marks
$= \frac{23+2+15+38+21+19+24+26}{8} = 21$
Scores of three students(19, 21, 23) are within a + 2 /- 2 range of the average score of the class.

Sol.84.(c) when all pieces of data are increased by 7, then the arithmetic mean also increases by 7.
For example two given no. x , 2x its mean = $\frac{x+2x}{2} = \frac{3x}{2}$ then add 7 in both numbers then (x + 7) ,(2x + 7).
So, the new mean
$= \frac{(x+7)+(2x+7)}{2} = \frac{3x}{2} + 7$

Sol.85.(b) $\frac{16+18+15+17+P+14}{6} = 17$
$\Rightarrow \frac{80+P}{6} = 17 \Rightarrow P = 22$

Sol.86.(b) Let the initial allowance = x
Average per day = $\frac{x}{15}$
New Average = $\frac{x}{24}$
A/Q,
$\frac{x}{15} - \frac{x}{24} = 75 \Rightarrow \frac{8x-5x}{120} = 75$
$\Rightarrow \frac{3x}{120} = 75 \Rightarrow \frac{x}{40} = 75 \Rightarrow x = Rs\ 3000$

Sol.87.(d)
Average age of 36 boys and professor = 18 years
Sum of ages of 36 boys and professor
$= 18 \times 37 = 666\ years$
Average age of boys only = 17 years
Sum of ages of boys
$= 17 \times 36 = 612\ years$
Age of Professor = 666 - 612 = 54 years

Sol.88.(c)
Sum of marks of all five students
$= 39.20 \times 5 = 196$
Sum of marks of 3 students
$= 41 \times 3 = 123$
Sum of marks of remaining two students
= 196 - 123 = 73
Average of remaining two students
$= \frac{73}{2} = 36.5$

Sol.89.(c) Mean marks of both the classes taken together
$= \frac{100 \times 25 + 50 \times 70}{150} = \frac{6000}{150}$
$= 40\ marks$

Sol.90.(c)
Let the 4 consecutive even integers
= x, x + 2, x + 4, x + 6
Average
$= \frac{x + x + 2 + x + 4 + x + 6}{4} = 27$
$= \frac{4x+12}{4} = 27 \Rightarrow x + 3 = 27$
$\Rightarrow x = 24$
Largest number = x + 6 = 24 + 6 = 30

Sol.91.(b)
Sum of all integers = $6 \times 45 = 270$
Let the smallest integer = x
Largest integer = x + 18
And for minimum smallest number all other number should be = x + 18
5(x + 18) + x = 270
$\Rightarrow 5x + x + 90 = 270$
$\Rightarrow 6x = 180$
$\Rightarrow x = 30\ (Smallest\ number)$

Sol.92.(a) Let , husband and wife salaries = 15x : 11x
Average of their salaries = 65000
$\frac{(15x + 11x)}{2}$ = 65000
$\Rightarrow$ 15x + 11x = 130000 $\Rightarrow$ 26x = 130000
$\Rightarrow$ 2x = 10000 $\Rightarrow$ x = 5000
Salary of the wife = 11x
= 11 × 5000 = Rs.55000

Sol.93.(c) A /Q , $\frac{X+Y+Z}{3}$
= 29 , X + Y + Z = 87 And $\frac{X+Y}{2}$
= 13 , X + Y = 26
Putting the value of (X + Y) = 26 ,
in (X + Y + Z) $\Rightarrow$ X + Y + Z = 87
$\Rightarrow$ 26 + Y = 87 $\Rightarrow$ Y = 61
Hence , 3rd number = 61

Sol.94.(d)
Let , smallest number = x, middle number = y and greatest numbers = z
A/Q , x + y + z = 53 × 3
$\Rightarrow$ x + y + z = 159 -----(i)
And z- x = 28 ----(ii)
Also y = x + 8 -----(iii)
From equation (i),(ii) & (iii)
x + x + 8 + x + 28 = 159
$\Rightarrow$ 3x + 36 = 159 $\Rightarrow$ x = 41
The greatest number = z = 28 + 41 = 69

Sol.95.(d)
Sum of marks of 45 students
$= 45 \times 16.2 = 729$
Sum of marks of 44 students
$= 44 \times 16.5 = 726$
Marks of student who left = 729 - 726 = 3
Sum of marks of all students after joining a new student = $16.4 \times 45 = 738$
Mark of student who join = 738 - 726 = 12
Average marks of students who left and who join = $\frac{3+12}{2} = 7.5$

Sol.96.(a) Mean
$= \frac{sum\ of\ given\ sequence\ numbers}{number\ of\ sequence}$
Mean = $\frac{2.2 + 4.2 + 6.4 + 8.3 + 10.5}{5}$
$= \frac{31.6}{5} = 6.32$

Sol.97.(a)
Sum of all 6 positive numbers = 270
Let largest integer = X
Smallest integer = X - 18
For maximum greatest integer, all other integers should be minimum
So all other 5 integers should be equal to X - 18
Sum = 270
$\Rightarrow$ X + 5 (X -18) = 270 $\Rightarrow$ 6X - 90 = 270
$\Rightarrow$ 6X = 360 $\Rightarrow$ X = 60

Sol.98.(b) Mean of the age of three friends = 22

Total age of three friends = 22 × 3 = 66
Mean of the age of four friends = 24
Total age of four friends = 24 × 4 = 96
The age of the fourth friend
= 96 - 66 = 30

Sol.99.(b) Sum of all 16 observations
$= 16 \times 12 = 192$
If 8 is subtracted from each of six of these observations
Sum of total decrease = $8 \times 6 = 48$
After decrease the sum of all observations = 192 - 48 = 144
Arithmetic mean = $\frac{144}{16} = 9$

Sol.100.(b) Given -
Sum of all 6 positive numbers
$= 6 \times 55 = 330$
Largest number - smallest number = 24
Let , smallest number = x
To get a larger number, we have to keep the value of the five numbers as the smallest.
A/Q
X + X + X + X + X + (24 + X) = 330
⇒ X = 51
Hence , Largest number = 24 + 51 = 75

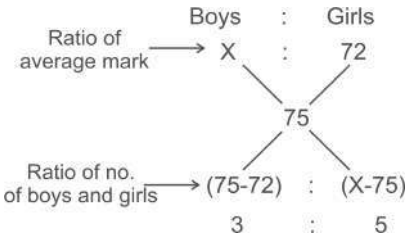
Sol.101.(a) Let the three consecutive natural numbers are x , x + 1 , x + 2 ;
i.e. $\frac{3x+3}{3} = k \Rightarrow x + 1 = k$;
Now two more numbers are added x + 3 and x + 4 ;
Then the new average will be = $\frac{5x+10}{5}$
$= x + 2 = k + 1$;

Sol.102.(c)
Sum of squares of 'n' natural numbers
$= \frac{n \times (n+1)(2n+1)}{6}$
Sum of squares of 1 to 10
$= \frac{10 \times (10+1)(20+1)}{6} = \frac{10 \times 11 \times 21}{6}$
$= 385$ Average $= \frac{385}{10} = 38.5$
When we subtract 5 from each number then average will also decreases by 5
Required average = 38.5 - 5 = 33.5

Sol.103.(d) Average of five consecutive odd numbers will be the middle term. I.e, 3rd term is the average of the five consecutive odd numbers if two more term will be added then ⇒ Total number of terms = 7
Average = 4th term = 3rd term + 2 = p + 2

Sol.104.(a) Total number of student in the class = 40 , Boys = 15 , so girls = 25
Mean marks of the class = 75. so , total marks = 40 × 75 = 3000
Now average marks of the girls = 72 so,total marks obtained by girls
= 25 × 72 = 1800
Therefore total marks obtained by boys
= 3000 - 1800= 1200
∴average marks of the boys
$= \frac{total\ marks\ obtained\ by\ boys}{total\ boys}$
$= \frac{1200}{15} = 80$

Short Tricks :-



Now , $x - 75 = 5 \Rightarrow x = 80$

Sol.105.(d)
Sum of the numbers = 113 × 5 = 565
Given that , when a number is excluded , the average remains same
Sum of remaining number
⇒ 113 × 4 = 452
Excluded number = 565 - 452 = 113

Sol.106.(a) To win a competition swami needs an average of 80 marks
Total marks require to win
= 80 × 4 = 320 marks
He get marks in first three subjects
= 68 + 78 + 88 = 234 marks
Marks required in fourth subject
= 320 - 234 = 86 marks

Sol.107.(a)
Sum of the numbers = 126 × 5 = 630
Given that , when a number is excluded , the average remains same
Sum of remaining number
⇒ 126 × 4 = 504
Excluded number = 630 - 504 = 126

Sol.108.(c) To qualify a competition huami needs an average of 80 marks
Total marks require to qualify
= 80 × 4 = 320 marks
He get marks in first three examinations
= 81 + 91 + 66 = 238 marks
Marks required in fourth subject
= 320 - 238 = 82 marks

Sol.109.(c) Total marks required to win
= 80 × 4 = 320 marks
His marks in first three examinations
= 74 + 84 + 94 = 252 marks
Marks required in fourth examination
= 320 - 252 = 68 marks

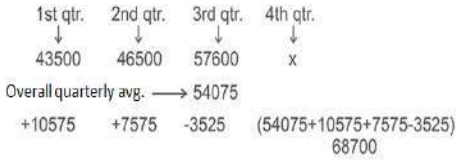
Sol.110.(c)
Sum of the numbers = 119 × 5 = 595
Given that , when a number is excluded , the average remains same
Sum of remaining number
⇒ 119 × 4 = 476
Excluded number = 595 - 476 = 119

Sol.111.(a) To win a competition Somi needs an average of 80 marks
Total marks require to win
= 80 × 4 = 320 marks
Marks he got in the first three exams
= 71 + 81 + 91 = 243 marks
Marks required in fourth subject
= 320 - 243 = 77 marks

sol.112.(d)
Sum of the numbers = 75 × 7 = 525
Given that , when a number is excluded , the average remains same
Sum of remaining number ⇒ 75 × 6 = 450
Excluded number = 525 - 450 = 75

sol.113.(c)
expenditure of company in 1st quarter of financial year = 43500
expenditure of company in 2nd quarter of financial year = 46500
expenditure of company in 3rd quarter of financial year = 57600
Total expenditure till 9 month
= 43500 + 46500 +57600 = 147600
According to question,
Total expenditure in given financial year
= 54075 × 4 = 216300
expenditure of company in last quarter of financial year = 216300 - 147600 = 68700

Short Tricks :-



Sol.114. (d)
total weight = 4 × 30 + 6 × 31 = 306
Now, average weight = $\frac{306}{10}$ = 30.6

Sol.115. (a) According to question ,
Ratio of gift got by boys are:-
Boy 1 : Boy 2 : Boy 3 : Boy 4
2 : 1
3 : 1
4 : 1
Now, equating ratio
Boy 1 : Boy 2 : Boy 3 : Boy 4
12 : 6 : 4 : 3
Now, 25 unit = 350 ⇒ 1 unit = 14
then, 12 unit = 168

Sol.116.(a) Let , the average call receive by female employees be x
Then,
1010 × 55 = 505 × 55 + 505 × x ⇒ x = 55

Sol.117.(a) Average weight of first 4 bracelets = 33 gms
Total weight of first 4 bracelets
= 33 gms × 4 = 132 gms
Average weight of remaining 6 bracelets = 34 gms
Total weight of remaining 6 bracelets
= 34 gms × 6 = 204 gms
Now , final weight of 10 bracelets
= 132 gms + 204 gms = 336 gms
Average = $\frac{336}{10}$ = 33.6 gms

Sol.118.(b) Total weight of 97 notebooks = 97 × 9.7 kg = 940.9 kg
Average weight after adding one more notebook = 9.8 kg
So, $\frac{940.9 + x}{98} = 9.8$
⇒ x = 960.4 - 940.9 = 19.5 kg

Sol.119.(c)
Average weight of first 4 bracelets
= 57 gms
Total weight of first 4 bracelets
= 57 gms × 4 = 228 gms
Average weight of remaining 6 bracelets = 58 gms
Total weight of remaining 6 bracelets
= 58 gms × 6 = 348 gms
Now , final weight of 10 bracelets
= 228 gms + 348 gms = 576 gms
Average = $\frac{576}{10}$ = 57.6 gms

Sol.120.(c) Average weight of first 4 bangles = 39 gms
Total weight of first 4 bangles
= 39 gms × 4 = 156 gms
Average weight of remaining 6 bangles = 40 gms
Total weight of remaining 6 bangles
= 40 gms × 6 = 240 gms
Now , final weight of 10 bangles
= 156 gms + 240 gms = 396 gms
Average = $\frac{396}{10}$ = 39.6 gms

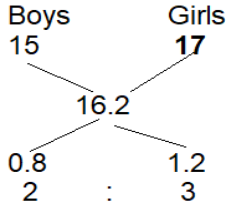
Sol.121.(a) Let , the average call receive by female employees be x
Then,
1026 × 63 = 513 × 63 + 513 × x = x = 63

Sol.122.(a) Average weight of first 4 bangles = 47 gms
Total weight of first 4 bangles
= 47 gms × 4 = 188 gms
Average weight of remaining 6 bangles = 48 gms
Total weight of remaining 6 bangles
= 48 gms × 6 = 288 gms
Now , final weight of 10 bangles
= 288 gms + 188 gms = 476 gms
Average = $\frac{476}{10}$ = 47.6 gms

Sol.123.(a) Average weight of first 4 bangles = 49 gms
Total weight of first 4 bangles
= 49 gms × 4 = 196 gms
Average weight of remaining 6 bangles = 50 gms
Total weight of remaining 6 bangles
= 50 gms × 6 = 300 gms
Now , final weight of 10 bangles
= 196 gms + 300 gms = 496 gms
Average = $\frac{496}{10}$ = 49.6 gms

sol.124.(a) Total weight of 63 notebooks = 63×6.3 kg = 396.9 kg
Average weight after adding one more book = 6.4 kg
So, $\frac{396.9 + x}{64} = 6.4$
⇒ x = 409.6 - 396.9 = 12.7 kg

Sol.125.(b) Using Alligation method, we have :



So, the mean score of the girls = 17

Sol.126.(c) Let the daily travel allowance at the beginning be x
ATQ,
⇒ 6x = (x - 56) × 10n ⇒ 6x = 10x - 560
⇒ 4x = 560 ⇒ x = $\frac{560}{4}$ = 140
For 6 days, travel cost = 140 × 6 = ₹840

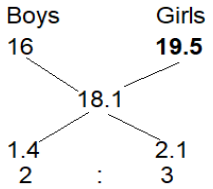
Sol.127.(c) Let the three no's be a, b, c
ATQ,
a + b + c = 6 × 3 = 18 -------- (1)
a + b = 5 × 2 = 10 -------- (2)
b + c = 8 × 2 = 16 -------- (3)
Subtracting eqn(2) from (1)
c = 18 - 10 = 8
Subtracting eqn(3) from (1)
a = 18 - 16 = 2
Putting the values in eqn(1) we have :
b = 18 - (8 + 2) = 18 - 10 = 8
So, the three no's are 2, 8, 8

Sol.128.(a) The average marks without new student being included,
He has got 7 × 3 = 21 marks more than the average marks.

Sol.129.(c) Mean of first 100 natural numbers = $\frac{100 \times 101}{2 \times 100}$ = 50.5

Sol.130.(a) Average of for no's = 16
Deviation in he average of A and B
= – 6.5 × 2 = - 13
Since, the net deviation should be zero.
So, the average of C and D
= 16 + $\frac{13}{2}$ = 16 + 6.5 = 22.5

Sol.131.(c) Sum of total marks of the students = 18.1 × 30 = 543
Sum of total marks of boys
= 12 × 16 = 192
Now, sum of total marks of girls
= 543 - 192 = 351
Hence , average marks of girls
= $\frac{351}{(30-12)}$ = 19.5
Alternate method :
Using Alligation method, we have :



So, the mean score of girls = 19.5

Sol.132.(a)
Mean temperature of a city = 28°C
Deviation in the average temperature for Monday to Thursday = - 0.5 × 4 = - 2°C
Deviation in the average temperature for Thursday to Sunday = + 1 × 4 = 4°C
Net deviation in temperature
= - 2 + 4 = 2°C
So, the temperature recorded for Thursday = 28 + 2 = 30°C

Sol.133.(c)
Average marks of 25 students = 60
Deviation in the average marks of first 13 students = + 10 × 13 = + 130
Deviation in the average marks of last 13 students = -10 × 13 = - 130
Net average marks = + 130 - 130 = 0
So, the marks of 13th student = 60 + 0 = 60

Sol.134.(b) Average of 13 numbers = 17
Deviation in the average of 5 smallest numbers= -2 × 5 = -10
So, Average of 8 largest numbers
= 17 + $\frac{10}{8}$ = 17 + 1.25 = 18.25

Sol.135.(a) Total marks of the group of 16 students = 16 × 20 = 320
After 1 student left, the total marks of the 15 students = 15 × 21 = 315
Marks of left student = 320 - 315 = 5
Again after 1 students joined the group, total marks of 16 students
= 16 × 20.5 = 328
Marks of the joined student
= 328 - 315 = 13
Now, average marks of the left and joined students = $\frac{5 + 13}{2} = 9$

Age

Some Important Point to Remember :-
If the present (current) age of a person is 'x' years , Then →
(i) Age 'n' years later/hence = (x + n) .
(ii) Age 'n' years ago/ before = (x – n) .
(iii) n times the age = nx years..
(iv) $\frac{1}{n}$ times the age = $\frac{x}{n}$ years.
Note :- If the ages are in a ratio a : b then age will be ax and bx.

Example.1. What is Suresh's present age, if 10 years later his age will be 5 times his age 6 years ago?

Solution: -
Let , present age of Suresh = x years.
10 years later his age = (x+10) years.
6 years ago his age = (x – 6) years.
Now , According to question ,
(x+10) = 5 (x – 6)
4x = 40 → x = 10 years

Example.2. One year ago, the ratio of Sujay and Sarita's age was 5:6 respectively, after 4 years, the ratio becomes 6:7. Find the present age of Sarita.

Solution: -
Let , the ages of Sujay and Sarita one year ago = 5x and 6x
Their present age will be (5x + 1) and (6x+1) .
Their ages 4 years later = (5x + 5) and (6x+5)
Now, According to question ,
$\frac{5x+5}{6x+5} = \frac{6}{7}$
x = 5 years
Now, present age of Sarita = (6x + 1)
→ (6 × 5 + 1) = 31 years

Variety Questions

Q.1. Srinivas has just got married to a girl who is 4 years younger than him. After 5 years their average age will be 33 years. Find the present age of the girl.
Group D 17/08/2022 (Morning)
(a) 35 years (b) 30 years
(c) 26 years (d) 31 years

Q.2. One year ago, the ratio of the ages of Saketh and Tilak was 5:6, respectively. Four years hence, this ratio would become 6:7. The present age of Saketh is:
Group D 17/08/2022 (Morning)
(a) 31 years (b) 25 years
(c) 26 years (d) 30 years

Q.3. My father is presently 25 years older than me. The sum of our ages 5 years ago was 39 years. Find my present age.
Group D 18/08/2022 (Morning)
(a) 15 years (b) 13 years
(c) 12 years (d) 20 years

Q.4. The sum of ages of P and Q is 15 years more than the sum of ages of Q and R. How many years younger is R as compared to P?
Group D 18/08/2022 (Afternoon)
(a) 15 (b) 12 (c) 13 (d) 19

Q.5. The present ages of a man and his wife are in the ratio 7 : 6. After 6 years this ratio will be 8 : 7. If at the time of their marriage, the ratio of their ages was 4 : 3, then how many years ago were they married?
Group D 24/08/2022 (Afternoon)
(a) 18 years (b) 16 years
(c) 15 years (d) 13 years

Q.6. Mohan's age is 150% of Rohan's age. Sohan's age is 250% of Rohan's age. If the sum of the ages of these three persons is 60 years, then find the age of Rohan.
Group D 26/08/2022 (Afternoon)
(a) 14 years (b) 15 years
(c) 13 years (d) 12 years

Q.7. Twice the present age of X is 9 years less than thrice the present age of Y. At present, X's father P is twice as old as X, and Y is 9 years younger than her sister Q . If P is 20 years older than Q,then the present age (in years) of Y is:
Group D 12/09/2022 (Morning)
(a) 23 (b) 18 (c) 21 (d) 19

Q.8. Farah got married 8 years ago. Today her age is $\frac{9}{7}$ times her age at the time of her marriage. At present her daughter's age is $\frac{1}{6}$ of her age. Her daughter's age 3 years ago was:
Group D 14/09/2022 (Afternoon)
(a) 6 years (b) 9 years
(c) 12 years (d) 3 years

Q.9. The average age of a husband and his wife was 23 years at the beginning of their marriage. After 5 years of marriage, they had a one-year-old child. The average age of the family of three when the child was born was:
Group D 14/09/2022 (Evening)
(a) 20 years (b) 18 years
(c) 24 years (d) 23 years

Q.10. A's age is seven times B's age. If the sum of their ages is 48 years, then their ages are:
Group D 16/09/2022 (Morning)
(a) 40 and 8 (b) 35 and 5
(c) 46 and 6 (d) 42 and 6

Q.11. A father is four times as old as his son. After 10 years the father's age will be 2.5 times that of his son. Find the son's present age.
Group D 19/09/2022 (Afternoon)
(a) 60 years (b) 40 years
(c) 10 years (d) 15 years

Q.12. The sum of the ages of three persons is 44 years and the numerical product of their ages is 1950. Also, the difference in the ages of the second and the third person, when subtracted from the difference in the ages of the first and the second person, is 5 years. Find the present age of the second person.
Group D 26/09/2022 (Morning)
(a) 10 years (b) 6 years
(c) 13 years (d) 25 years

Q.13. The ages of Mahender and Zahid are in the ratio 6 : 7. Fifteen years ago their ages were in the ratio 9 : 11. Mahender's present age is :
NTPC CBT - I 10/01/2021 (Morning)
(a) 18 years (b) 54 years
(c) 60 years (d) 10 years

Q.14. Aman's great - grandfather is 105 years old. Aman's father Ram Singh's age $\frac{1}{3}$ of his grandfather. Five years ago, when Aman was born, Ram Singh's mother was double the age of Ram Singh. What is the difference of age between Aman and Ram Singh ?
NTPC CBT - I 13/01/2021 (Morning)
(a) 20 years (b) 25 Years
(c) 35 years (d) 30 years

Q.15. The sum of the reciprocals of the ages of two colleagues is nine times the difference of the reciprocals of their ages. If the ratio of the products of their ages to the sum of their ages is 100 : 9. Find their ages ?
NTPC CBT - I 30/01/2021 (Evening)
(a) 20 years, 25 years
(b) 15 years, 10 years
(c) 24 years, 45 years
(d) 25 years, 4 years

Q.16.In a family, the father's age is 5 times the age of one of his sons. Mother's age is 4 times the age of their other son. Difference in the parents' ages is half the sum of the sons' ages. Then:
RRB JE 02/06/2019 (Evening)
(a) They are twins

(b) The difference in their ages is 5
(c) One son is twice as old as the other
(d) The sum of their ages is a multiple of 5

Q.17. The difference between Charles' and Shriya's ages is 6 years. When they married each other 30 years ago, 4 times Charles's age was the same as 5 times the age of Shriya. What is the total of their present ages ?
RRB ALP Tier - I 10/08/2018 (Evening)
(a) 114 years (b) 110 years
(c) 115 years (d) 112 years

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.18. A is twice as old as B. B is 1/3 as old as C. The sum of ages of A, B and C is 42 years, find the sum of the ages of A and B.
Group D 17/08/2022 (Afternoon)
(a) 12 years (b) 15 years
(c) 21 years (d) 23years

Q.19. The age of a father six years ago was six times the then age of his daughter. Three years hence, the father will be thrice as old as his daughter. What is the present age of the daughter?
Group D 17/08/2022 (Evening)
(a) 15 years (b) 12 years
(c) 17 years (d) 20 years

Q.20. Aruna has a younger sister whose age is 8 years less than that of Aruna. If Aruna's sister's age is 18 years, then Aruna's age is:
Group D 17/08/2022 (Evening)
(a) 28 years (b) 26 years
(c) 10 years (d) 24 years

Q.21. The present ages of Shanthi and Keerthi are in the ratio of 7 : 3. After 5 years, Shanthi's age will be 40. How old will Keerthi be after 5 years?
Group D 17/08/2022 (Evening)
(a) 10 years (b) 30 years
(c) 20 years (d) 15 years

Q.22. The sum of the present ages of a father and his daughter is 80 years. Eight years ago, the father's age was seven times the age of his daughter. Eight years from now, what will be the daughter's age?
Group D 18/08/2022 (Evening)
(a) 18 years (b) 20 years
(c) 22 years (d) 24 years

Q.23. Kohli is younger than Rohit by 3 years. If the ages of Kohli and Rohit are in the ratio 7:8, how old is Kohli?
Group D 22/08/2022 (Morning)
(a) 18 years (b) 27 years
(c) 24 years (d) 21 years

Q.24. A father is presently 3 times his daughter's age. After 10 years he will be twice as old as her. Find the daughter's present age.
Group D 22/08/2022 (Morning)
(a) 15 years (b) 5 years
(c) 20 years (d) 10 years

Q.25. Ten years ago, a mother was 3 times as old as her son. 5 years ago she was $\frac{5}{2}$ times her son's age.
What is her present age?
Group D 23/08/2022 (Morning)
(a) 30 years (b) 35 years
(c) 55 years (d) 45 years

Q.26. In the year 2000, Monu was 3 times his sister's age. In 2010, he was 24 years older than her. Find Monu's age in 2010.
Group D 23/08/2022 (Morning)
(a) 38 years (b) 46 years
(c) 52 years (d) 62 years

Q.27. Rani's sister's age is 4 years more than her age. If her sister's age is 28 years, then find Rani's age.
Group D 23/08/2022 (Afternoon)
(a) 26 years (b) 32 years
(c) 24 years (d) 22 years

Q.28. The sum of the ages of a mother, son and daughter is 70 years. If the mother is thrice as old as her son, and the daughter is 5 years older than her brother, how old is the mother?
Group D 23/08/2022 (Afternoon)
(a) 39 years (b) 35 years
(c) 42 years (d) 45 years

Q.29. Twelve years ago Rekha's age was equal to $\frac{2}{5}$ of her sister's age. The present ages of Rekha and her sister are in the ratio 3 : 4. What is the sum of their present ages?
Group D 24/08/2022 (Afternoon)
(a) 28 years (b) 36 years
(c) 48 years (d) 42 years

Q.30. The age of a father is seven times the age of his son. Three years from now, the age of the father will be five times that of his son. What is the present age of the father?
Group D 24/08/2022 (evening)
(a) 36 years (b) 39 years
(c) 45 years (d) 42 years

Q.31. Ten years ago, a son was $\frac{1}{8}$th of his father's age. Now, he is $\frac{9}{37}$ th of his father's present age. Find the present age of the father.
Group D 25/08/2022 (Morning)
(a) 67 years (b) 74 years
(c) 57 years (d) 87 years

Q.32. One year ago, Krishna was four times as old as his daughter Kavitha. Six years hence, Krishna's age will be 12 years more than his daughter's age. Find the ratio of the present ages of Krishna and his daughter.
Group D 25/08/2022 (Morning)
(a) 11 : 3 (b) 9 : 2 (c) 12 : 5 (d) 17 : 5

Q.33. The average age of Raj and his sister is 8 years. If Raj's age is 10 years, then find the age of his sister.
Group D 25/08/2022 (Afternoon)
(a) 7 years (b) 9 years
(c) 6 years (d) 8 years

Q.34. Today, age of the father is twice the sum of the ages of his 3 children. After 15 years father's age will be equal to the sum of the ages of his children. How old is the father 15 years from today?
Group D 25/08/2022 (Evening)
(a) 90 years (b) 85 years
(c) 75 years (d) 95 years

Q.35 Chandra is 10 years younger than Chandrika. 5 years later Chandrika will be twice as old as Chandra. Find Chandrika's present age.
Group D 25/08/2022 (Evening)
(a) 20 years (b) 10 years
(c) 15 years (d) 25 years

Q.36. The difference of the ages of two siblings is 7 years. If the sum of their ages is 21 years, how old is the younger of the siblings?
Group D 26/08/2022 (Morning)
(a) 3 years (b) 7 years
(c) 14 years (d) 10 years

Q.37. The ratio between the present ages of P and Q is 7 : 5, respectively. The ratio between P's age 5 years ago and Q's age 5 years hence is 1 : 1. What is the ratio between P's age 5 years hence and Q's age 5 years ago?
Group D 26/08/2022 (Morning)
(a) 1 : 2 (b) 2 : 1 (c) 3 : 2 (d) 2 : 3

Q.38. The sum of the ages of five children born at intervals of three years each, is 60 years. How old is the youngest child?

Group D 26/08/2022 (Evening)
(a) 6 years (b) 4 years
(c) 7 years (d) 5 years

Q.39. Ramya was married 10 years ago. Now his age is $1\frac{1}{5}$ times of his age at the time of marriage. The age of his daughter is equal to $\frac{1}{10}$ of his present age. Find the present age of his daughter.
Group D 26/08/2022 (Evening)
(a) 12 years (b) 14 years
(c) 20 years (d) 6 years

Q.40. If the age of Ratan is one-third the age of Jatin and the sum of their ages is 84 years, then find the age of Jatin.
Group D 29/08/2022 (Afternoon)
(a) 36 years (b) 25 years
(c) 63 years (d) 52 years

Q.41. A is two years older than B, who is twice as old as C. If the total of their ages is 32, then what is the age of B?
Group D 29/08/2022 (Evening)
(a) 14 years (b) 12 years
(c) 7 years (d) 8 years

Q.42. The present age of a father is $1\frac{1}{2}$ times the sum of the present ages of his two sons. Six years hence, the ratio of his age to the sum of the ages of his sons will be 6 : 5. The present age of the father is:
Group D 30/08/2022 (Morning)
(a) 45 years (b) 36 years
(c) 42 years (d) 50 years

Q.43. The average age of a family of father, mother and 2 children is 26 years. If the sum of the ages of the father and the children is 62 years, find the age of the mother.
Group D 30/08/2022 (Morning)
(a) 42 years (b) 30 years
(c) 26 years (d) 45 years

Q.44. The difference between the ages of Radha and Rama is 6 years and the sum of their ages is 26. Find Radha's age, if she is older than Rama.
Group D 30/08/2022 (Afternoon)
(a) 26 years (b) 32 years
(c) 16 year (d) 6 years

Q.45. Geetha, Latha and Madhuri's ages are in the ratio 5 : 6 : 3. If their average age is 42 years, then find Latha's age.
Group D 30/08/2022 (Evening)
(a) 54 years (b) 27 years
(c) 45 years (d) 35 years

Q.46. The sum of the ages of Sarala and Kishore is 26 years. If 3 years ago, Kishore was $\frac{3}{2}$ times as old as the Sarala, then the present age of the Sarala is:
Group D 01/09/2022 (Morning)
(a) 11 years (b) 9 years
(c) 10 years (d)12 years

Q.47. If twice the son's age is added to the father's age, the sum is 34 years. If 1.5 times the father's age is added to the son's age, the sum is 45 years. What is the father's age (in years)?
Group D 01/09/2022 (Afternoon)
(a) 26 (b) 28 (c) 30 (d) 32

Q.48. The sum of two times the present age of A and three times the present age of B is 106 years. Four times the present age of B exceeds three times the present age of A by 11 years. What will be the sum of the ages (in years) of A and B, 4 years from now?
Group D 01/09/2022 (Evening)
(a) 49 (b) 47 (c) 43 (d) 51

Q.49. Sanjay is 25 years older than his son and Sanjay's wife is 65 years old. If the average age of all the three members of this family is 58 years, then find the age of the son.
Group D 02/09/2022 (Afternoon)
(a) 45 years (b) 43 years
(c) 41 years (d) 42 years

Q.50. Three times the present age of Renu is 11 years more than two times the present age of Manav, and three times the present age of Manav is 9 years less than four times the present age of Renu. The sum of the present ages (in years) of Renu and Manav is:
Group D 02/09/2022 (Afternoon)
(a) 32 (b) 31 (c) 37 (d) 29

Q.51. The sum of the present ages of a father and his son is 6 years more than 3 times the present age of the son. After 2 years. 2 times the father's age will be 7 years less than 5 times the son's age. The difference (in years) between the ages of the father and the son is:
Group D 02/09/2022 (Evening)
(a) 17 (b) 20 (c) 19 (d) 23

Q. 52. Suman's present age is twice that of Venkat's. Venkat's age, after 12 years, will be 21 years. Find Suman's present age.
Group D 02/09/2022 (Evening)
(a) 18 years (b) 20 years
(c) 16 years (d) 22 years

Q.53. Vamsi's father is 60 years old. He is 20 years older than twice Vamsi's age. Find Vamsi's age.
Group D 05/09/2022 (Morning)
(a) 20 years (b) 30 years
(c) 25 years (c) 15 years

Q.54. A father said to his son, "I was as old as you are at the time of your birth. If the present age of the father is 40 years, then what was the age of the son 5 years ago?" ,
Group D 06/09/2022 (Afternoon)
(a) 14 years (b) 16 years
(c) 18 years (d) 15 years

Q.55. Three times the present age of P is 25 years more than the present age of Q . After 10 years, twice the age of Q will be 18 years less than thrice the age of P. Find the present age (in years) of Q .
Group D 08/09/2022 (Afternoon)
(a) 19 (b) 21 (c) 17 (d) 16

Q.56. One year ago, a man was 7 times as old as his daughter. Now his age is equal to the square of his daughter's age. If the daughter has already celebrated her first year birthday, then their present ages are:
Group D 08/09/2022 (Evening)
(a) 7 and 49 (b) 4 and 28
(c) 6 and 36 (d) 5 and 25

Q.57. The present ages of two persons are 46 years and 60 years, respectively. If after 'n' years, the ratio of their ages is 4: 5, then the value of 'n' is:
Group D 09/09/2022 (Morning)
(a) 11 (b) 12 (c) 13 (d) 10

Q.58. 10 years ago, the ratio of the ages of A and B was 5 : 9. 15 years from now, the ratio of their ages will be 15 : 17. What will be A's age 15 years from now?
Group D 09/09/2022 (Afternoon)
(a) 30 years (b) 38 years
(c) 35 years (d) 26 years

Q.59. The sum of two times Manavi's present age and Tanvi's present age is 35 years. Tanvi's father is presently three times as old as Tanvi. Manavi's brother's present age is 6 years more than Manavi's present age. The sum of the present ages of Tanvi's father and Manavi's brother is 56 years. What is the sum of the present ages (in years) of Manavi and Tanvi?
Group D 09/09/2022 (Evening)
(a) 24 (b) 27 (c) 23 (d) 31

Q.60. The ratio of the ages of A and B is 5: 9. After 7 years, B's age will be 52 years. Six years ago. A's age was:
Group D 12/09/2022 (Afternoon)

(a) 19 years (b) 35 years
(c) 44 years (d) 24 years

Q.61. Five years ago, the average age of A, B and C was 35 years. Five years from now, the average age of A and C will be 48 years. What will be the age (in years) of B, three years from now?
Group D 12/09/2022 (Evening)
(a) 35 (b) 34 (c) 37 (d) 38

Q.62. Two times the present age of Anu is 6 years more than the present age of Bina. The present age of Anu's mother (M) is three times the present age of Anu, and Bina is 5 years younger than her sister (S). If the sum of the present ages of M and S is 64 years, then Anu's present age (in years) is:
Group D 12/09/2022 (Evening)
(a) 15 (b) 17 (c) 13 (d) 14

Q.63. Father's age is three times the sum of ages of his two children. After 6 years, his age will be twice the sum of the ages of both the children. The age of the father is:
Group D 13/09/2022 (Afternoon)
(a) 50 years (b) 52 years
(c) 54 years (d) 36 years

Q.64. The sum of the ages of a man and his son is 68 years. After 5 years, the age of man will be five times the age of his son. The present age of the son is:
Group D 13/09/2022 (Afternoon)
(a) 8 years (b) 9 years
(c) 7 years (d) 10 years

Q.65. The sum of the present ages of Bunty and Bubbly is 32 years. After 2 years, Bunty's age will be three times that of Bubbly. Bunty's present age (in years) is:
Group D 14/09/2022 (Morning)
(a) 25 (b) 7 (c) 20 (d) 13

Q.66. Four years ago, Rajesh was three times as old as Naresh. Four years hence he will be twice as old as Naresh will then be. The present age of Rajesh (in years) is:
Group D 15/09/2022 (Morning)
(a) 32 (b) 33 (c) 35 (d) 28

Q.67. At present, the ratio of the ages of Amit and Sumit is 4 : 3. After 6 years, Amit's age will be 50 years. What is the age of Sumit at present?
Group D 15/09/2022 (Afternoon)
(a) 33 years (b) 44 years
(c) 24 years (d) 37 years

Q.68. Five years from now, father's age will be three times the age of his son. Five years ago, father was seven times as old as his son. Their present ages are:
Group D 16/09/2022 (Afternoon)
(a) 30 and 10 (b) 30 and 5
(c) 40 and 5 (d) 40 and 10

Q.69. Ramu is younger than Sunil by 8 years. If their present ages are in the ratio of 7 : 9, then how old is Ramu?
Group D 16/09/2022 (Afternoon)
(a) 72 years (b) 36 years
(c) 28 years (d) 56 years

Q.70. The sum of the present ages of Ram, Nikhil and Aswin is 111 years. Ten years ago, the ratio of their ages was 2 : 3 : 4. What is the present age (in years) of Nikhil?
Group D 17/09/2022 (Morning)
(a) 37 (b) 16 (c) 28 (d) 44

Q.71. At present, a man is 50 years old and his daughter is 22 years old. The man will be twice as old as his daughter after_____ years.
Group D 17/09/2022 (Morning)
(a) 9 (b) 5 (c) 18 (d) 6

Q.72. Ten years ago, Krishna was one-third as old as he will be 20 years from now. Krishna's present age (in years) is _____
Group D 17/09/2022 (Afternoon)
(a) 30 (b) 25 (c) 45 (d) 27

Q.73. The sum of the ages of William and Brijesh is 20 years. Four years ago, Brijesh's age was half of William's then age. How old (in years) is William at present?
Group D 17/09/2022 (Evening)
(a) 6 (b) 12 (c) 10 (d) 8

Q.74. Five years hence the age of Ramesh will be three times the then age of his son, and 5 years ago his age was seven times the then age of his son. Ramesh's present age (in years) is:
Group D 17/09/2022 (Evening)
(a) 42 (b) 40 (c) 44 (d) 38

Q.75. Five years hence, the age of Jacob will be four times that of his son. Three years ago, Jacob's age was seven times that of his son. Their present ages are:
Group D 18/09/2022 (Afternoon)
(a) 59 and 21 (b) 59 and11
(c) 69 and 11 (d) 49 and 21

Q.76. The difference between the ages of Radha and Murari is 12 years. Five years ago, the sum of their ages was 28 years. If Radha is older than Murari, find Murari's present age (in years).
Group D 18/09/2022 (Afternoon)
(a) 17 (b) 15 (c) 13 (d) 25

Q.77. The ratio of the present ages of A to B is 7 : 3. The ratio of A's age 4 years ago to B's age 4 years hence is 2 : 1. The difference between A's age 4 years hence and B's age 4 years ago is:
Group D 19/09/2022 (Evening)
(a) 88 years (b) 56 years
(c) 46 years (d) 36 years

Q.78. Five years ago the sum of the ages of A and B was 58 years. The difference between B's age 8 years ago and A's age 8 years hence is 16 years. The ratio of the present ages of A and B is:
Group D 19/09/2022 (Evening)
(a) 5 : 13 (b) 9 : 25 (c) 36 : 52 (d) 25 : 9

Q.79. The ratio of the present ages of Monu and Sonu is 3 : 4. The ratio of the age of Monu 5 years ago and that of Sonu 5 years hence is 2 : 5. Find Monu's present age.
Group D 20/09/2022 (Morning)
(a) 15 years (b) 18 years
(c) 20 years (d) 66 years

Q.80. The ratio of the present ages of Somu and Ranu is 5 : 4 and the sum of their ages is 27 years. The ratio of their ages after 8 years will be,_____
Group D 20/09/2022 (Afternoon)
(a) 23 : 20 (b) 8 : 3 (c) 25 : 29 (d) 3 : 4

Q.81. Five years ago, Roshan was three times as old as Preethi. If the difference between their ages is 6 years, the present age (in years) of Preethi is_____.
Group D 20/09/2022 (Afternoon)
(a) 4 (b) 7 (c) 8 (d) 6

Q.82. The age of Vanraj is thrice the age of his son. The age of his daughter is 3 years less than the age of his son. If 3 years ago the sum of the ages of these three was 63 years, then find the present age (in years) of Vanraj.
Group D 22/09/2022 (Afternoon)
(a) 36 (b) 30 (c) 45 (d) 42

Q.83. Rani is elder to Rosy by 1 year, and Rosy is elder to Rimmy by 1 year. The sum of their ages is 48 years. What is Rosy's age?
Group D 26/09/2022 (Evening)
(a) 21 years (b) 16 years
(c) 15 years (d) 17 years

Q.84. Shalini's age is four times the sum of the ages of her two sons. Six years hence, her age will be double the sum of their ages. What is Shalini's present age?
Group D 27/09/2022 (Morning)

(a) 32 years (b) 40 years
(c) 26 years (d) 36 years

Q.85. Nine years ago, P's age was twice the age of Q . If the ratio of their present ages is 5 : 4, what is the sum of their present ages?
Group D 28/09/2022 (Evening)
(a) 35 years (b) 27 years
(c) 40 years (d) 30 years

Q.86. The ages of two persons differ by 14 years. If 4 years ago, the elder one was three times as old as the younger one, then the present age of younger one is:
Group D 29/09/2022 (Afternoon)
(a) 10 years (b) 12 years
(c) 11 years (d) 13 years

Q.87. 16 years ago, the age of the father was 4 times the age of his son. Now the father is twice as old as his son. What is the difference between the present ages of the father and his son?
Group D 29/09/2022 (Evening)
(a) 12 years (b) 16 years
(c) 28 years (d) 24 years

Q.88. Arun is the elder brother of Kiran. The difference in their ages is 20 years. If 5 years ago, Arun was 5 times as old as Kiran then was, then find the present age (in years) of Arun.
Group D 30/09/2022 (Morning)
(a) 30 (b) 40 (c) 20 (d) 10

Q.89. The sum of 6 times Bob's age and 5 times Will's age is 43 years, and the sum of 5 times Bob's age and 5 times Will's age is 40 years. Find the age of Bob.
Group D 30/09/2022 (Afternoon)
(a) 5 years (b) 3 years
(c) 1 year (d) 10 years

Q.90. One year ago, Praveena was four times as old as her daughter. Six years hence, Praveena's age will exceed twice her daughter's age by 7 years. What is the sum of their present ages?
Group D 30/09/2022 (Evening)
(a) 32 years (b) 37 years
(c) 35 years (d) 39 years

Q.91. The present age of a father is 5 years more than three times the age of his daughter. Four years hence, the father's age will be 8 years more than twice the age of his daughter. The present age of the daughter is:
Group D 30/09/2022 (Evening)
(a) 6 years (b) 7 years
(c) 8 years (d) 9 years

Q.92. At present, the difference of the ages of a mother and son is 30 years. 15 years ago, the mother's age was twice the then age of the son. The present age (in years) of the mother is:
Group D 06/10/2022 (Morning)
(a) 75 (b) 90 (c) 45 (d) 60

Q.93. Kamal is the father of Vishnu. The sum of their present ages is 60 years. If 6 years ago, Kamal's age was 5 times the then age of Vishnu, then find the present age (in years) of Vishnu.
Group D 06/10/2022 (Morning)
(a) 15 (b) 20 (c) 10 (d) 14

Q.94. Kamal is now four times as old as his son now is. After 18 years his son will be half as old as Kamal would then be. Find the present age (in years) of the son.
Group D 06/10/2022 (Evening)
(a) 9 (b) 36 (c) 24 (d) 10

Q.95. Raja is the father of Vikram. Raja is now 13 times as old as Vikram. After 10 years, Raja's then age will be 3 times the then age of Vikram. Find the present age (in years) of Vikram.
Group D 06/10/2022 (Evening)
(a) 2 (b) 4 (c) 3 (d) 1

Q.96. The age of Raghu 8 years ago was thrice the then age of Mohan. Eight years hence, Raghu's age will be twice of Mohan's age. Find the ratio of the present ages of Mohan and Raghu, respectively.
Group D 07/10/2022 (Morning)
(a) 3 : 7 (b) 3 : 5 (c) 6 : 7 (d) 4 : 5

Q.97. If the product of the ages of M and N is 486 years and the ratio of their ages is 3 : 2, what is the sum of their ages?
Group D 07/10/2022 (Morning)
(a) 45 years (b) 60 years
(c) 65 years (d) 70 years

Q.98. Kamal has two children, Vishnu and Deeksha. At present, Kamal is 3 times as old as Vishnu. Deeksha is 3 years younger than Vishnu. 3 years ago, the sum of the then ages of all three of them was 63 years. Find the present age (in years) of Kamal.
Group D 07/10/2022 (Afternoon)
(a) 54 (b) 45 (c) 46 (d) 20

Q.99. Rajesh's daughter's age is $\frac{1}{3}$ of Rajesh's wife's age. Rajesh's wife's age is $\frac{3}{4}$ of Rajesh's age, and Rajesh's age is $\frac{3}{5}$ of Rajesh's father's age. Find the age of Rajesh's daughter if Rajesh's father's age is 60 years.
Group D 07/10/2022 (Evening)
(a) 9 years (b) 7 years
(c) 13 years (d) 11 years

Q.100. Avinash's age is 5 times his son Aravind's age. Four years hence, the age of Avinash will be four times Aravind's age. Find the average of their present ages.
Group D 11/10/2022 (Evening)
(a) 30 years (b) 24 years
(c) 28 years (d) 36 years

RRB NTPC CBT - 2 (09/05/2022 to 17/06/2022)

Q.101. The present average age of X, Y and Z is 44 years. 8 years ago the average age of X and Y was 38 years. What is the present age of Z?
Level 5 (12/06/2022) Shift 1
(a) 39 years (b) 38 years
(c) 41 years (d) 40 years

Q.102. Five years ago, the average age of A, B and C was 17 years. Seven years ago, the average age of A and B was $17\frac{1}{2}$ years. What will be the age (in years) of C after 2 years from now?
Level 3 (14/06/2022) Shift 2
(a) 19 (b) $20\frac{1}{2}$ (c) 20 (d) $18\frac{1}{2}$

Q.103. The average age of 34 boys in a class is 12 years . If the age of teacher is also included, the average age increases by 1 year. What is the age of the teacher?
Level 3 (17/06/2022) Shift 1
(a) 45 (b) 42 (c) 44 (d) 47

RRB NTPC CBT - 1 (28/12/2020 to 31/07/2021)

Q.104. In 8 years, Subhash will be 3 times as old as he is now. After how many years will Subhash be 5 times as old as he is now ?
RRB NTPC 19/01/2021 (Evening)
(a) 24 (b) 30 (c) 16 (d) 20

Q.105. The present ages of Sheo Kumar and Dileep Kumar are in the ratio of 9 : 10. After 11 years this ratio will become 10 : 11. What are the present ages of Sheo Kumar and Dileep Kumar ?
RRB NTPC 23/01/2021 (Evening)
(a) 81 years and 90 years
(b) 54 years and 60 years
(c) 72 years and 80 years
(d) 99 years and 110 years

Q.106. Three times the present age of Sujata is 5 years more than two times the present age of Vanita. After 3 years, three times the age of Vanita will be 4 years less than four times the age of Sujatha. The age of Vanita is k years more than that of Sujatha. What is the value of k?
RRB NTPC 25/01/2021 (Morning)
(a) 7 (b) 4 (c) 9 (d) 3

Q.107. Ten years ago, X was 5 years old and his age was half of the age of Y. At that time, Z was 8 years younger than his brother P. Z was 18 years old at that time. What is the ratio of the respective ages of Z and P at present ?
RRB NTPC 25/01/2021 (Evening)
(a) 7 : 9 (b) 9 : 7 (c) 14 : 19 (d) 4 : 5

Q.108. The sum of the present age of Aditi, Aditya and Adya is 120 years. What was the sum of their ages three years ago ?
RRB NTPC 31/01/2021 (Morning)
(a) 111 (b) 118 (c) 114 (d) 112

Q.109. John is twice as old as Jean. After 3 years, the sum of the ages will be 66 years. What are the present ages of Jean and John, respectively ?
RRB NTPC 31/01/2021 (Evening)
(a) 40 and 20 years (b) 42 and 84 years
(c) 20 and 40 years (d) 24 and 48 years

Q.110. Narendra's mother is four times as old as Narendra. Four years ago, his mother was six times as old as Narendra was. What are their present ages ?
RRB NTPC 01/02/2021 (Evening)
(a) 7 years, 28 years
(b) 10 years, 40 years
(c) 5 years, 20 years
(d) 20 years, 80 years

Q.111. The ratio of the present ages of Alok and Anil is 3 : 4. Alok's age 20 years from now will be 62 years. Then what is Anil's present age ?
RRB NTPC 03/02/2021 (Morning)
(a) 60 years (b) 52 years
(c) 56 years (d) 64 years

Q.112. The sum of the ages of father and son is 56 years. 7 years ago the father's age was 5 times the age of the son. What are the present ages of father and son respectively ?
RRB NTPC 01/04/2021 (Evening)
(a) 45, 11 years (b) 42, 14 years
(c) 47, 9 years (d) 48, 8 years

Q.113. The present ages of Ram and Shyam are in the ratio 7 : 8 respectively. After nine years this ratio will become 8 : 9. The present ages (in years) of Ram and Shyam respectively are :
RRB NTPC 05/04/2021 (Evening)
(a) 73, 64 (b) 72, 63 (c) 64, 73 (d) 63, 72

Q.114. Four years ago, the ratio of the age of Ram to that of Shyam was 13 : 9. Eight years from now, their ages will be in the ratio 4 : 3. The difference (in years) between their present ages is :
RRB NTPC 08/04/2021 (Evening)
(a) 17 (b) 16 (c) 19 (d) 18

Q.115. Three years ago, the average age of A and B was 28 years. With C joining them, their current average age becomes 42 years. How old is C now?
RRB NTPC 26/07/2021 (Evening)
(a) 73 years (b) 68 years
(c) 77 years (d) 64 years

RRB JE
(22/05/2019 to 28/06/2019)

Q.116. The total of ages of X, Y and Z is 27. X is 2 years older than Y and Y is twice as old as Z. What is the age of Y ?
RRB JE 22/05/2019 (Evening)
(a) 12 (b) 5 (c) 8 (d) 10

Q.117. Rajan got married 8 years back. His age then was $\frac{5}{6}$ of his present age. His sister was 10 years younger at the time of his marriage. How old is she now ?
RRB JE 22/05/2019 (Afternoon)
(a) 40 (b) 26 (c) 32 (d) 38

Q.118. One year ago the ratio of the ages of two sister was 2 : 3. The sum of their present ages is 12. What are their ages now?
RRB JE 23/05/2019 (Evening)
(a) 5,7 (b) 7.5, 4.5 (c) 9,3 (d) 8,4

Q.119. Ages of Sundar and Seema are in the ratio 5 : 4. Three years hence, the ratio of their ages will become 11 : 9. What is Seema's present age?
RRB JE 23/05/2019 (Evening)
(a) 24 (b) 40 (c) 27 (d) 25

Q.120. A's age: B's age is 4 : 3. After 6 years, A will be 26 years. What is B's present age?
RRB JE 24/05/2019 (Evening)
(a) 15 (b) 9 (c) 18 (d) 12

Q.121. Ages of P, Q and R are in the ratio 4 : 7 : 9. 8 years ago, the age of R was Q's present age. What is the sum of their ages at present?
RRB JE 24/05/2019 (Evening)
(a) 60 (b) 100 (c) 50 (d) 80

Q.122. The sum of ages of 5 children born at intervals of four years is 80. What is the age of the eldest child?
RRB JE 26/05/2019 (Morning)
(a) 16 (b) 18 (c) 28 (d) 24

Q.123. The average age of 4 persons is 42 years. If their ages are in the ratio of 1: 3 : 4 : 6 respectively, find out the difference between the ages of the eldest and the youngest person.
RRB JE 26/05/2019 (Afternoon)
(a) 60 years (b) 59 years
(c) 61 years (d) 70 years

Q.124. Six years ago the ratio of ages of P and Q was 6 : 5. Four years hence, it will be 11 : 10. What is the age of P now?
RRB JE 30/05/2019 (Morning)
(a) 15 years (b) 18 years
(c) 25 years (d) 20 years

Q.125. Ages of A and B differ by 6 and are in the ratio 3 : 5. What is the sum of their ages?
RRB JE 31/05/2019 (Evening)
(a) 24 (b) 40 (c) 16 (d) 32

Q.126. If 4 years are subtracted from the age of a person and divided by 5, the result gives his grandson's age. The grandson now has a sister aged 5, six years younger to him. How old is the grandfather?
RRB JE 31/05/2019 (Evening)
(a) 58 (b) 57 (c) 60 (d) 59

Q.127. Ages of two brothers differ by 7 and are in the ratio 3 : 2. What is the sum of their ages?
RRB JE 01/06/2019 (Morning)
(a) 21 (b) 42 (c) 35 (d) 45

Q.128. Total age of two members in a family four years hence will be 64 years. Four years back their ages was in the ratio 3 : 1. What is the age of the younger of the two?
RRB JE 01/06/2019 (Afternoon)
(a) 10 (b) 16 (c) 12 (d) 15

Q.129. Sum and difference of the ages of two children are 33 and 3 respectively. What is the age of the elder child?
RRB JE 01/06/2019 (Afternoon)
(a) 15 years (b) 16 years
(c) 18 years (d) 24 years

Q.130. Five years ago, the average age of a couple was 24. At present, the average of the couple and a child is 20. What is the child's age?
RRB JE 01/06/2019 (Evening)
(a) 1 year (b) 2 years
(c) 4 years (d) 3 years

Q.131. A father has a 12 year old son. He was thrice his son's present age when the son was born. How old is the father now ?
RRB JE 02/06/2019 (Afternoon)
(a) 48 years (b) 46 years
(c) 60 years (d) 40 years

Q.132. A grandfather and his granddaughter have their ages in the ratio 9 : 2. Sum of their ages is a perfect square. The difference in their ages is a multiple of 11. What are their ages?
RRB JE 02/06/2019 (Afternoon)
(a) 90, 20 (b) 95, 25 (c) 72, 16 (d) 99, 22

Q.133. The sum and difference of the ages of two brothers are in the ratio 5 : 1. If the product of their ages is 96, then what are their ages ?
RRB JE 26/06/2019 (Evening)
(a) 8, 12 (b) 6, 16 (c) 6, 10 (d) 24, 4

Q.134. Sum of the ages of two sisters is 81. Their ages are the ratio 4 : 5. By how many years is one sister younger than the other?
RRB JE 27/06/2019 (Morning)
(a) 9 (b) 27 (c) 18 (d) 12

Q.135. The sum of the ages of a father and son is 45 years. Five years ago, the product of their ages was four times the father's age at that time. What is the present age of the father?
RRB JE 27/06/2019 (Evening)
(a) 36 (b) 42 (c) 28 (d) 60

Q.136. A father is now five times as old as his son. Five years back, he was six times as old as his son. Find the age of his son.
RRB JE 27/06/2019 (Evening)
(a) 32 years (b) 35 years
(c) 25 years (d) 28 years

Q.137. A is two years older than B who is twice as old as C. If the total ages of A, B and C are 27, then how old is B ?
RRB JE 28/06/2019 (Evening)
(a) 9 (b) 7 (c) 10 (d) 8

Q.138. The total age of A and B is 12 years more than the total age of B and C. Who is younger among A and C, and by how many years ?
RRB JE 28/06/2019 (Evening)
(a) A, by 6 years (b) C, by 12 years
(c) A, by 12 years (d) C, by 6 years

RRB ALP Tier - 2 (21/01/2019 to 08/02/2019)

Q.139 . Five years ago X was three times as old as Y and ten years hence, X will be twice as old as Y. What is the present age of X?
ALP Tier II 21/01/2019 (Afternoon)
(a) 50 (b) 60 (c) 30 (d) 40

Q.140. 5 years ago, Rohan's father's age was 8 times Rohan's age. After 5 years the ratio of Rohan's father's age to Rohan's age will be 10 : 3. What is the present age of Rohan?
ALP Tier II 21/01/2019 (Afternoon)
(a) 10 years (b) 8 years
(c) 15 years (d) 12 years

Q.141. The sum of the present ages of father and son is 45 years. 5 years ago, the ratio of their ages was 6 : 1. Find the present age of the father.
ALP Tier II 21/01/2019 (Evening)
(a) 25 years (b) 40 years
(c) 35 years (d) 30 years

Q.142. At present, the ratio between the ages of Anu and Dimpy is 5 : 8. After 2 years, the ratio of their ages will be 2 : 3. What was Dimpy's age 2 years ago?
ALP Tier II 23/01/2019 (Morning)
(a) 12 (b) 10 (c) 14 (d) 16

Q.143. The sum of the ages of 4 children born at an interval of 2 years is 28 years. What is the age of the youngest child?
ALP Tier II 08/02/2019 (Morning)
(a) 3 year (b) 2 year (c) 5 year (d) 4 year

RPF Constable (17/01/2019 to 19/02/2019)

Q.144. The ages of Ram and Raj are in the 4 : 5 ratio. If the sum of their age is 126, then find the difference between their ages.
RPF Constable 17/01/2019 (Morning)
(a) 17 (b) 15 (c) 16 (d) 14

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.145. Seven years from now Virat will be twice as old as Mohinder. Five years ago Mohinder's age was one year less than $\frac{2}{5}$ of Virat's age. What is Virat's present age?
RRB ALP 09/08/2018 (Morning)
(a) 51 years (b) 55 years
(c) 53 years (d) 57 years

Q.146. Three years from now Dharitri's age will be eight years less than twice Eunice's age. The sum of their present ages is 61 years. What is Dharitri's present age?
RRB ALP 09/08/2018 (Morning)
(a) 43 years (b) 36 years
(c) 41 years (d) 39 years

Q.147. Three-fifths of my current age is the same as five-sixths of that of one of my cousins'. My age ten years ago will be his age four years hence. My current age is _____ years.
RRB ALP 09/08/2018 (Afternoon)
(a) 60 (b) 45 (c) 50 (d) 55

Q.148. The sum of the present ages of two cousins is 46 years. Eight years ago, the elder one was twice as old as the younger one. What is the present age of the elder cousin?
RRB ALP 09/08/2018 (Evening)
(a) 30 years (b) 28 years
(c) 26 years (d) 22 years

Q.149. Krish is 5 years younger than Parthiv. Eight years ago three times the age of Krish was 10 more than twice the age of Parthiv. Find Krish's present age.
RRB ALP 10/08/2018 (Morning)
(a) 32 years (b) 33 years
(c) 30 years (d) 28 years

Q.150. Present ages of Sai and Satheesh are in the ratio of 5 : 4 respectively. Three years hence, the ratio of their ages will become 11 : 9 respectively. What is Satheesh's present age in years?
RRB ALP 10/08/2018 (Morning)
(a) 22 (b) 24 (c) 21 (d) 23

Q.151. One-third of Poojitha's age three years ago plus one-half of her age two years from now is twenty years. How old is she now?
RRB ALP 10/08/2018 (Evening)
(a) 23 years (b) 26 years
(c) 24 years (d) 25 years

Q.152. The difference between Peter and Preeti's ages is 5 years. When they married each other 35 years ago, 4 times Peter's age was the same as 5 times the age of Preeti. What is the current sum of their ages?
RRB ALP 13/08/2018 (Morning)
(a) 105 years (b) 112 years
(c) 115 years (d) 110 years

Q.153. 13 years ago Ram was twice as old as Sunny. Three years from now Sunny's age will be $\frac{3}{5}$ of Ram's age. What is Ram's current age?
RRB ALP 13/08/2018 (Morning)
(a) 72 years (b) 77 years
(c) 64 years (d) 80 years

Q.154. Roshan's current age is three

years less than 1.5 times that of Usha's. 12 years ago Usha's age was three years more than half of Roshan's age. What is Roshan's present age in years?
RRB ALP 14/08/2018 (Afternoon)
(a) 42 (b) 33 (c) 39 (d) 30

Q.155. Ram's father is twice as old as Ram is. Eight years ago the age of Ram's father was 2.5 times his age. What is Ram's current age?
RRB ALP 14/08/2018 (Afternoon)
(a) 25 years (b) 24 years
(c) 23 years (d) 22 years

Q.156. The sum of the present ages of a father and his son is 60 years. Six years ago, father's age was five times the age of the son. After 6 years, son's age will be:
RRB ALP 20/08/2018 (Morning)
(a) 21 years (b) 19 years
(c) 15 years (d) 20 years

Q.157. Monika's father was 38 years of age when she was born while her mother was 36 years old when her brother four years younger to her was born. What is the difference between the ages of her parents?
RRB ALP 20/08/2018 (Morning)
(a) 3 years (b) 6 years
(c) 4 years (d) 2 years

Q.158. The present ages of Kavitha, Rajitha and Haritha are in the ratio of 4: 7 : 9. Eight years ago, the sum of their ages was 56. Find their present ages (in years).
RRB ALP 20/08/2018 (Evening)
(a) 12, 21, 27 (b) 20, 35, 45
(c) 16, 36, 28 (d) 16, 28, 36

Q.159. Satheesh is two years older than Goutham who is twice as old as Sai. If the total of the ages of Satheesh, Goutham and Sai is 27, then how old is Goutham ?
RRB ALP 20/08/2018 (Evening)
(a) 13 (b) 11 (c) 12 (d) 10

Q.160. Jeremy is 26 years younger than his father. Eight years hence his father's age will be two years less than twice his age. What is Jeremy's present age (in years)?
RRB ALP 21/08/2018 (Afternoon)
(a) 18 (b) 20 (c) 24 (d) 22

Q.161. Two-thirds of my current age is the same as three-fourths of that of one of my cousins'. My age three years ago will be his age four years hence. My current age is _____years.
RRB ALP 29/08/2018 (Morning)
(a) 63 (b) 81 (c) 54 (d) 72

Q.162. Priyankur's present age is seven years less than thrice the age of his cousin Rihana. Sixteen years from now Priyakur's age will be 150% of that of Rihana. What is Priyankur's present age (in years) ?
RRB ALP 29/08/2018 (Evening)
(a) 20 (b) 17 (c) 23 (d) 26

Q.163. 15 years ago Cynthia was thrice as old as Brittany. The sum of their present ages is 94 years. How old is Brittany now ?
RRB ALP 30/08/2018 (Morning)
(a) 33 years (b) 30 years
(c) 31 years (d) 32 years

Q.164. Jina is 24 years younger than her mother. Eight years hence her mother's age will be $\frac{5}{3}$ times her age. What is Jina's present age (in years) ?
RRB ALP 30/08/2018 (Evening)
(a) 28 (b) 22 (c) 26 (d) 24

Q.165. Pinaki is 9 years younger than Bhaswati. Thirteen years hence Bhaswati will be 1.2 times as old as Pinaki. Find Pinaki's present age.
RRB ALP 31/08/2018 (Morning)
(a) 30 years (b) 33 years
(c) 28 years (d) 32 years

Q.166.15 years ago, Shyam was twice as old as Prabhat. Five years from now Prabhat's age will be $\frac{5}{8}$ of Shyam's age. What is Shyam's current age ?
RRB ALP 31/08/2018 (Evening)
(a) 80 years (b) 72 years
(c) 64 years (d) 75 years

Q.167. Neetu is 10 years elder to Meetu, and Meetu is 7 years elder to Geetu. If the sum of their ages is 48 years, what is Neetu's age (in years)?
RRB ALP 30/08/2018 (Evening)
(a) 22 (b) 27 (c) 28 (d) 25

Answer Key :-

1.(c)	2.(c)	3.(c)	4.(a)
5.(a)	6.(d)	7.(d)	8.(d)
9.(b)	10.(d)	11.(c)	12.(c)
13.(c)	14.(d)	15.(a)	16.(a)
17.(a)	18.(c)	19.(b)	20.(b)
21.(c)	22.(d)	23.(d)	24.(d)
25.(c)	26.(b)	27.(c)	28.(a)
29.(b)	30.(d)	31.(b)	32.(d)
33.(c)	34.(c)	35.(c)	36.(b)
37.(b)	38.(a)	39.(d)	40.(c)
41.(b)	42.(c)	43.(a)	44.(c)
45.(a)	46.(a)	47.(b)	48.(d)
49.(d)	50.(a)	51.(c)	52.(a)
53.(a)	54.(d)	55.(c)	56.(c)
57.(d)	58.(a)	59.(a)	60.(a)
61.(c)	62.(c)	63.(c)	64.(a)
65.(a)	66.(d)	67.(a)	68.(d)
69.(c)	70.(a)	71.(d)	72.(b)
73.(b)	74.(b)	75.(b)	76.(c)
77.(b)	78.(b)	79.(a)	80.(a)
81.(c)	82.(c)	83.(b)	84.(d)
85.(b)	86.(c)	87.(d)	88.(a)
89.(b)	90.(b)	91.(b)	92.(a)
93.(d)	94.(a)	95.(a)	96.(a)
97.(a)	98.(b)	99.(a)	100.(d)
101.(d)	102.(a)	103.(d)	104.(c)
105.(d)	106.(b)	107.(a)	108.(a)
109.(c)	110.(b)	111.(c)	112.(b)
113.(d)	114.(b)	115.(d)	116.(d)
117.(d)	118.(a)	119.(a)	120.(a)
121.(d)	122.(d)	123.(a)	124.(b)
125.(a)	126.(d)	127.(c)	128.(b)
129.(c)	130.(b)	131.(a)	132.(d)
133.(a)	134.(a)	135.(a)	136.(c)
137.(c)	138.(b)	139.(a)	140.(a)
141.(c)	142.(c)	143.(d)	144 .(d)
145.(b)	146.(d)	147.(c)	148.(b)
149.(d)	150.(b)	151.(c)	152.(c)
153.(b)	154.(a)	155.(b)	156.(d)
157.(b)	158.(d)	159.(d)	160.(b)
161.(a)	162.(c)	163.(c)	164.(a)
165.(d)	166.(d)	167.(d)	

Solutions:

Sol.1.(c)
Let age of wife and husband is n and m
m - n = 4 .....(1)
After 5 years, sum of their age
= 33 x 2 = 66
Sum of their present age = 66 -10 = 56
m + n = 56 .....(2)
Now on solving (1) and (2)
M = 30 and n = 26 so age of wife is 26 years

Sol.2.(c)

Difference = 1unit = (1 + 4) = 5 years
After 4 year, age of Saketh = 6 unit
= 6 × 5 = 30 years ,
Present age of Saketh = 30 - 4 = 26 years.

Sol.3.(c)
Let the present age of son = x years
And the present age of father = (x + 25) years
According to the question,
Sum of their age 5 years ago = 39
(x - 5) + (x + 25 - 5) = 39
2x + 15 = 39
x = 12
Present age of son = 12 years

Sol.4.(a) $P + Q = Q + R + 15$
$P = R + 15$
R is 15 years younger than P.

Sol.5.(a)
Let their present age be 7x and 6x
$\frac{7x+6}{6x+6} = \frac{8}{7}$
$\Rightarrow 49x + 42 = 48x + 48$
$\Rightarrow 49x - 48x = 48 - 42 \Rightarrow x = 6$
Their present ages are 42 and 36 years.
Let x years ago, they were married.
Now, $\frac{42-x}{36-x} = \frac{4}{3}$
$\Rightarrow 126 - 3x = 144 - 4x$
$\Rightarrow -3x + 4x = 144 - 126$
$\Rightarrow x = 18$
18 years ago , they got married.

Sol.6.(d) According to the question

Mohan	:	Rohan	:	Sohan
150	:	100		
		100	:	250
150	:	100	:	250
3	:	2	:	5

Now, (3 + 2 + 5) unit = 60
So, 1 unit = 6
Therefore, age of Rohan (2 unit) = 6 × 2
= 12 years

Sol.7.(d) ATQ,
3Y - 2X = 9 .....(1)
And ,
P = 2X , Q = Y + 9
P - Q = 20 ....(2)
By putting value of P and Q in equation (2)
2X - Y - 9 = 20
2X - Y = 29 ....(3)
Now, by adding equation (1) with (3)
3Y - 2X = 9
2X - Y = 29
2Y = 38
Therefore age of Y = 19 year

Sol.8.(d) She got married at the age of x years.
Now, her present age = x + 8
$x + 8 = \frac{9x}{7} \Rightarrow \frac{9x}{7} - x = 8$
$\Rightarrow \frac{2x}{7} = 8 \Rightarrow x = 28$
Present age of her daughter
= $\frac{1}{6} \times (28 + 8) = \frac{1}{6} \times 36$ = 6 years
Hence, 3 years ago her daughter was
(6 - 3) = 3 years

Sol.9.(b) The sum of the ages of husband and wife = 23 × 2 = 46 years
After four years, when the child born,
The sum of their ages = 46 + 8 = 54
New average = $\frac{54}{3} = 18$

Sol.10.(d) Let the age of B be x years and the age of A be 7x.
$x + 7x = 48 \Rightarrow 8x = 48 \Rightarrow x = 6$
Then, A's age = 42 years and B's age
= 6 years

Sol.11.(c) Let the present age of son be x years and father's age be 4x.
After 10 years, $4x + 10 = 2.5(x + 10)$
$\Rightarrow 4x - 2.5x = 25 - 10$
$\Rightarrow 1.5x = 15 \Rightarrow x = 10$
Hence, the present age of his son is 10 years.

Sol.12.(c) Let the ages of three persons be x, y and z.
$x + y + z = 44$..... (1)
$xyz = 1950$
$x - y - y + z = 5$
$\Rightarrow x - 2y + z = 5$..... (2)
By solving eq(1) and (2) we get, y = 13
The age of the second person = 13 years.

Sol.13.(c) The ages of Mahender and Zahid are in the ratio = 6 : 7 and
Fifteen years ago their ages were in the ratio 9 : 11.
balancing the given ratio
We get the present ratio of ages
= $(6 : 7) \times 2 = 12 : 14$
15 years ago ratio of ages was
= $(9 : 11) \times 1 = 9 : 11$
According to the question :
3 units = 15 years.
12 units = 60 years.
Mahender's present age is 60 years.

Sol.14.(d)
Ram singh's age = $\frac{105}{3} = 35\ years$
Ram singh's mother age 5 years ago
= (35 - 5) × 2 = 60 years
Age of Aman = 5 years
Diff between ram singh and Aman
= 35 - 5 = 30 years

Sol.15.(a) Let, age of persons = X and Y
$(\frac{1}{X}) + (\frac{1}{Y}) = 9 \times (\frac{1}{X} - \frac{1}{Y})$
$\Rightarrow (\frac{x+y}{XY}) = 9 \times (\frac{x-y}{XY})$
$\frac{X+Y}{X-Y} = \frac{9}{1}$
From above eq . we get $X = \frac{5Y}{4}$ .....(a)
A/Q ,
$\frac{XY}{X+Y} = \frac{100}{9}$ .....(b)
Put value of X from eq . (a) to eq . (b)
On simplification we will get, X = 25
On putting this value of Y in eq . (a) we get Y = 20.
So, age of colleagues are 20 years and 25 years.

Sol.16.(a) Let, the age of the first son = x years ,Age of father = 5x
And, age of other son = y years
Age of mother = 4y
A.T.Q, $(5x - 4y) = \frac{x+y}{2}$
$\Rightarrow$ 10x - 8y = x + y $\Rightarrow$ 9x = 9y
$\Rightarrow$ x = y. so they are twin

Sol.17.(a) Let the Shriya's and Charles' present ages be x and x + 6 respectively
ATQ,
4(x + 6 - 30) = 5(x - 30)
$\Rightarrow$ 4(x - 24) = 5x - 150
$\Rightarrow$ 4x - 96 = 5x - 150 $\Rightarrow$ x = 54
So, the total of their present ages
= 2x + 6 = 2 × 54 + 6 = 114 yrs

Sol.18.(c) Let the present age of C = 3x,
Then present age of B = x
And present age of A = 2x
$3x + x + 2x = 42$
$\Rightarrow 6x = 42 \Rightarrow x = 7$
Hence, the sum of the ages of A and B
$= 2x + x = 14 + 7 = 21\ years.$

Sol.19.(b)
Let 6 year ago the age of his daughter = x years and father's age = 6x
Present age of daughter = x+6 and Present age of father = 6x + 6
$6x + 6 + 3 = 3(x + 6 + 3)$
$\Rightarrow 6x + 9 = 3x + 27$
$\Rightarrow 6x - 3x = 27 - 9$
$\Rightarrow 3x = 18 \Rightarrow x = 6$
Hence, the present age of daughter
= x + 6 = 12 years.

Sol.20.(b) Let the age of Aruna = x and the age of Aruna's sister = x - 8.
$x - 8 = 18 \Rightarrow x = 18 + 8 = 26$
Hence, the age of Aruna = 26 years.

Sol.21.(c) Let the age of Shanti = 7x and the age of Keerthi = 3x
$7x + 5 = 40$
$\Rightarrow 7x = 40 - 5 \Rightarrow 7x = 35 \Rightarrow x = 5$
After 5 years Keerthi's age = 3x + 5
= 20 years

Sol.22.(d) Let the daughter's present age be x years, and her father's present age be (80 - x) years.
Now, $7(x - 8) = 80 - x - 8$
$\Rightarrow 7x + x = 80 - 8 + 56$
$\Rightarrow 8x = 128 \Rightarrow x = 16$
After 8 years, daughter's age = 16 + 8
= 24 years.

Sol.23.(d) According to the question,
Kohli : Rohit
Ages → 7 : 8
Difference between them = 8 - 7 = 1 unit
So, 1 unit → 3 years (given)
Therefore age of kohli = 7 × 3 = 21 years

Sol.24.(d) According to the question,
Ratio → father : daughter
present → 3 : 1 —------(i)
After 10 y→ 2 : 1 —--------(ii)
We know that difference in age will be constant, so multiply (ii) by 2
Ratio → father : daughter
present → 3 : 1
After 10 y → 4 : 2
Difference in age after 10 years
→ 4 - 3 = 1 unit, 1 unit = 10 years
Therefore present age of daughter
= 1 unit = 10 years

Sol.25.(c) Let 10 years ago her son's age was x years and his mother's age = 3x years
Now, $3x + 5 = \frac{5}{2}(x + 5)$
$\Rightarrow 3x - \frac{5}{2}x = 12.5 - 5 \Rightarrow 0.5x = 7.5$
$\Rightarrow x = 15$
Her present age = 3x + 10 = 15 × 3 + 10
= 45 + 10 = 55 years.

Sol.26.(b)
Let Monu's sister age in 2000 = x years
Then, Monu's age = 3x
Now, $3x + 10 = x + 10 + 24$
$\Rightarrow 3x - x = 34 - 10$
$\Rightarrow 2x = 24$
$\Rightarrow x = 12$
Monu's age in 2010 = 3x + 10
= 12 × 3 + 10 = 36 + 10 = 46 years

Sol.27.(c) Rani's age = 28 - 4 = 24 years

Sol.28.(a) Let her son's age be x years.
Her daughter age = x + 5 and mother's age = 3x
Now, $x + x + 5 + 3x = 70$
$\Rightarrow 5x = 70 - 5$
$\Rightarrow 5x = 65 \Rightarrow x = 13$
Mother's age = 3x = 3 × 13 = 39 years

Sol.29.(b)
Let their present age be 3x and 4x.
$\frac{3x - 12}{4x - 12} = \frac{2}{5}$
$\Rightarrow 15x - 60 = 8x - 24$
$\Rightarrow 15x - 8x = -24 + 60 \Rightarrow 7x = 36$
$\Rightarrow x = \frac{36}{7}$, Sum of their ages
= 7 x = 7 × $\frac{36}{7}$ = $36\ years$

Sol.30.(d)
Let the present age of his son be x years.
Then his father's age = 7x
$7x + 3 = 5(x + 3)$
$\Rightarrow 7x - 5x = 15 - 3$
$\Rightarrow 2x = 12 \Rightarrow x = 6$
His father's present age
= 7x = 7 × 6 = 42 years.

Sol.31.(b) Let 10 years ago his father age was x years, then his son's age = $\frac{x}{8}$
Now, $(\frac{x}{8} + 10) = \frac{9}{37}(x + 10)$
$\Rightarrow \frac{9x}{37} - \frac{x}{8} = 10 - \frac{90}{37}$
$\Rightarrow \frac{35x}{296} = \frac{280}{37}$
$\Rightarrow x = \frac{280}{37} \times \frac{296}{35} = 64$
Present age of the father = x + 10
= 64 + 10 = 74 years.

Sol.32.(d) Let kavita was x years old 1 year ago, then Krishna was 4x
Present age of kavita = x + 1 and Present age of Krishna = 4x + 1
Six years hence,
$x + 1 + 6 + 12 = 4x + 1 + 6$
$\Rightarrow 4x - x = 12 \Rightarrow 3x = 12 \Rightarrow x = 4$
Required ratio = (4x + 1) : (x + 1) = 17 : 5

Sol.33.(c)
Let the age of his sister be x years.
$\frac{x + 10}{2} = 8$
$\Rightarrow x + 10 = 16 \Rightarrow x = 6\ years.$

Sol.34.(c)
Let the sum of ages of 3 children be x years then his father's age = 2x
$x + 45 = 2x + 15$
$\Rightarrow 2x - x = 45 - 15 \Rightarrow x = 30$
After 15 years, his father's age = 2x + 15
= 60 +15 = 75 years.

Sol.35.(c) Let the present age of Chandrika be x years, then Chandra's age = x - 10
According to the question,
$x + 5 = 2(x - 10 + 5)$
$\Rightarrow x + 5 = 2x - 10$
$\Rightarrow 2x - x = 5 + 10 \Rightarrow x = 15$
Chandrika's present age = 15 years

Sol.36.(b) Let ages of siblings = x and y ……..[Here x>y]
Given,
x + y = 21 ….(1)
x - y = 7 …. (2)
After subtracting equation (2) from (1)
2y = 14
y = 7
Age of younger sibling = 7 years

Sol.37.(b)
Let present age of P and Q = 7x and 5x
According to the question,
$\frac{7x - 5}{5x + 5} = \frac{1}{1}$ ⇒ 7x - 5 = 5x + 5
⇒ 2x = 10 ⇒ x = 5
Present age of P = 7 × 5 = 35 years
Present age of Q = 5 × 5 = 25 years
Therefore required ratio = (35 + 5):
$(25 - 5) = 40:20 = 2:1$

Sol.38.(a)
Let the age of first child be x years.
$x + x + 3 + x + 6 + x + 9 + x + 12 = 60$
$\Rightarrow 5x + 30 = 60$
$\Rightarrow 5x = 30 \Rightarrow x = 6$
Hence,
Age of the smallest child = 6 years.

Sol.39.(d) Let her present age be x , then 10 years ago her age was x - 10
$\frac{x}{x - 10} = \frac{6}{5}$
$\Rightarrow 5x = 6x - 60 \Rightarrow x = 60$
Her daughter's present age = $\frac{60}{10}$
= 6 years.

Sol.40.(c) Let the Jatin's age be x years, and Ratan's age be $\frac{x}{3}$ years
$x + \frac{x}{3} = 84 \Rightarrow \frac{4x}{3} = 84$
$\Rightarrow x. = 63\ years$

Sol.41.(b) Let the age of C be x, then B's age = 2x and A's age = 2x + 2
$x + 2x + 2x + 2 = 32$
$\Rightarrow 5x = 30 \Rightarrow x = 6$
B's age = 2x = 2 × 6 = 12 years.

Sol.42.(c) Let the sum of the ages of his two sons be x years then his father's age = $\frac{3x}{2}$
Ratio of father's age to the sum of two sons's age = 3x : 2x
$\frac{3x + 6}{2x + 6 + 6} = \frac{6}{5}$
$\Rightarrow 15x + 30 = 12x + 36 + 36$
$\Rightarrow 15x - 12x = 72 - 30$
$\Rightarrow 3x = 42 \Rightarrow x = 14$
The present age of his father = 3x

= 3 × 14 = 42 years.

Sol.43.(a) $\frac{F+M+C1+C2}{4} = 26$

$\Rightarrow F + M + C1 + C2 = 104$

$\Rightarrow M = 104 - 62 = 42$

Hence mother's age = 42 years.

Sol.44.(c) Let the age of Radha be x years and Rama be y years.

$x - y = 6$..... (1)

$x + y = 26$..... (2)

By solving eq .(1) and (2) we get , x = 16 and y = 10

Hence , Radha's age = 16 years.

Sol.45.(a)

Let their ages are 5x , 6x and 3x.

$\frac{5x+6x+3x}{3} = 42$

$\Rightarrow 14x = 126 \Rightarrow x = 9$

Latha's age = 6x = 6 × 9 = 54 years.

Sol.46.(a) Let the age of Sarala be x years then age of Kishore = (26 - x) years

$(26 - x - 3) = \frac{3(x-3)}{2}$

$\Rightarrow \frac{3x}{2} + x = 23 + \frac{9}{2}$

$\Rightarrow \frac{5x}{2} = \frac{55}{2} \Rightarrow x = 11$

Hence , the present age of Sarala = 11 years.

Sol.47.(b) Let the age of son = x, and father's age = y

According to the question

2x + y = 34 ....(1) And,

x + 1.5y = 45 .....(2) multiply with 2

So, 2x + 3y = 90 .....(2)

After subtracting equation (1) from (2)

2x + 3y = 90

2x + y = 34

2y = 56

Therefore age of father (y) = 28 years

Sol.48.(d) Let the present age of A be x years and B be y years.

$2x + 3y = 106$..... (1) × 3

$4y - 3x = 11$..... (2) × 2

On solving eq .(1) and (2), we get x = 23 and y = 20

After 4 years, sum of their ages = 23 + 4 + 20 + 4 = 51 years.

Sol.49.(d) Let his son's age = x years then Sanjay's age = (x + 25) years

Average age of family

$= \frac{x+x+25+65}{3} = 58$

$\Rightarrow 2x + 90 = 174$

$\Rightarrow 2x = 174 - 90 \Rightarrow 2x = 84 \Rightarrow x = 42$

His son's age = 42 years.

Sol.50.(a) Let the age of Renu = x years

And age of Manav = y years.

$3x - 2y = 11$..... (1)

$4x - 3y = 9$..... (2)

On solving eq .(1) and (2) , we get x = 15 and y = 17

The sum of the present age of Renu and Manav = 15 + 17 = 32 years.

Sol.51.(c) Let the age of son be x years and the age of father be y years.

Then , $x + y = 3x + 6$

$\Rightarrow 3x - x - y = -6 \Rightarrow 2x - y = -6$..... (1)

After 2 years, $2(y + 2) + 7 = 5(x + 2)$

$\Rightarrow 5x + 10 = 2y + 4 + 7$

$\Rightarrow 5x - 2y = 1$..... (2)

Solving eq .(1) and (2) we get ,

x = 13 , y = 32

Hence, the difference between the age of his father and son = 32 - 13 = 19 years

Sol.52.(a) Let the Venkat's present age be x years , then Suman's age = 2x

$x + 12 = 21 \Rightarrow x = 21 - 12 \Rightarrow x = 9$

Suman's present age = 2x = 2 × 9 = 18 years.

Sol.53.(a)

Let the age of Vamsi be x years.

A.T.Q

$2x + 20 = 60 \Rightarrow 2x = 60 - 20$

$\Rightarrow 2x = 40 \Rightarrow x = 20$

Hence, age of vamsi = 20 years.

Sol.54.(d) let the age of son = x

According to the question,

	Father		son
Initial age →	x	:	0
Present age	40	:	x

Difference between their initial age and present age will be equal.

40 - x = x - 0

so , x = 20 years

Age of son 5 years ago = 20 - 5 = 15 years

Sol.55.(c)

$3P = Q + 25 \Rightarrow 3P - Q = 25$..... (1)

$3(P + 10) - 18 = 2(Q + 10)$

$\Rightarrow 3P - 2Q = 8$..... (2)

By solving eq . (1) and (2),

we get P = 14 and Q = 17

Hence, present age of Q = 17 years.

Sol.56.(c) Let 1 Year ago, his daughter's age was x years, then father's age = 7x

$7x + 1 = (x + 1)^2$

$\Rightarrow 7x + 1 = x^2 + 1 + 2x$

$\Rightarrow x^2 + 2x - 7x = 1 - 1$

$\Rightarrow x^2 - 5x = 0$

$\Rightarrow x^2 = 5x \Rightarrow x = 5$

Their present age , (x+1) = 5 + 1 = 6 years and (7x + 1) =35 + 1 = 36 years.

Sol.57.(d) $\frac{46+n}{60+n} = \frac{4}{5}$

$\Rightarrow 5(46 + n) = 4(60 + n)$

$\Rightarrow 230 + 5n = 240 + 4n$

$\Rightarrow 5n - 4n = 240 - 230 \Rightarrow n = 10$

Sol.58.(a) ATQ,

$\frac{5x+25}{9x+25} = \frac{15}{17}$

85x + 425 = 135x + 375

⇒ 50 x = 50 ⇒ x = 1

Present age of A = 5 × 1 + 10 = 15 year

So, age of A after15 year = 15 + 15 = 30 year

Sol.59.(a) Let age of Tanvi and Manavi be T and M year respectively

ATQ,

2M + T = 35 ....(1) And

Tanvi's father age = 3T

Manavi's brother age =M+ 6

Now,

3T + M + 6 = 56

3T + M = 50 (by multiplying with 2)

6T + 2M = 100 ....(2)

By subtracting equation (1) from (2)

6T + 2M = 100

2M + T = 35

5T = 65

Therefore, age of Tanvi (T) =13

and,

2M + 13 = 35 ⇒ 2M = 22

Age of Manavi (M) = 11

so sum of the present ages of Manavi and Tanvi = 11 + 13 = 24

Sol.60.(a) ATQ,

A : B = 5 : 9

And ,

⇒ 9x + 7 = 52 ⇒ 9x = 45

So x = 5

Now, present age of A = 5 × 5 = 25 years

Therefore age of A 6 year ago = 25 - 6 = 19 years

Sol.61.(c) Present average age of A , B and C = 35 + 5 = 40 years

Present average age of A and C = 48 - 5 = 43

So, present age of B = 40 × 3 - 43 × 2 = 34

Therefore age of B, 3 year from now = 34 + 3 = 37 years

Sol.62.(c) Let the age of Annu = A year and the age of Bina = B year

ATQ,

2A - B = 6 ...(1)

And ,

M = 3A and S = B + 5

M + S = 64 ...(2)

By putting the value of M and S in equation (2)

3A + B + 5 =64

⇒ 3A + B = 59 ....(3)

By adding equation (1) and (3)

2A - B = 6
3A + B = 59
5A = 65
A = 13
Therefore, age of Annu (A) = 13 year

Sol.63.(c) Let the sum of his two children be x years.
Present age of father = 3x
After 6 years, $2(x + 6 + 6) = 3x + 6$
$\Rightarrow 2x + 24 = 3x + 6$
$\Rightarrow 3x - 2x = 24 - 6 \Rightarrow x = 18$
Hence, the age of father = 3x
= 3 × 18 = 54 years.

Sol.64.(a) Let the present ages of his son and man be x and (68 - x).
$5(x + 5) = 68 - x + 5$
$\Rightarrow 5x + 25 = 73 - x$
$\Rightarrow 5x + x = 73 - 25$
$\Rightarrow 6x = 48 \Rightarrow x = 8$
Hence, the present age of son = 8 years

Sol.65.(a) Let the present age of Bunty be x and present age of Bubbly be (32 - x)
After 2 years, $x + 2 = 3(32 - x + 2)$
$\Rightarrow x + 2 = 96 - 3x + 6$
$\Rightarrow x + 3x = 96 - 2 + 6 \Rightarrow 4x = 100 \Rightarrow x = 25$
Hence,the present age of Bunty
= 25 years.

Sol.66.(d) Let the age of Naresh 4 years ago was x years and age of Rajesh was 3x Present age of Naresh = x + 4 and present age of Rajesh = 3x + 4
4 years hence,
$3x + 4 + 4 = 2(x + 4 + 4)$
$\Rightarrow 3x - 2x = 16 - 8 \Rightarrow x = 8$
Hence, the present age of Rajesh = 3x + 4
= 24 + 4 = 28 years

Sol.67.(a) Let the present age of Amit and Sumit be 4x and 3x
$4x + 6 = 50 \Rightarrow 4x = 50 - 6$
$\Rightarrow 4x = 44 \Rightarrow x = 11$
Hence, the present age of Sumit
= 3x = 33 years.

Sol.68.(d) Let the age of son 5 years ago was x years and the age of father was 7x
Present age of son = x+5 and present age of father = 7x + 5
A/q , $7x + 5 + 5 = 3(x + 5 + 5)$
$\Rightarrow 7x + 10 = 3x + 30$
$\Rightarrow 7x - 3x = 30 - 10$
$\Rightarrow 4x = 20 \Rightarrow x = 5$
Hence, the present age of son = 5 + 5
=10 years and the present age of father
= 7 × 5 + 5 = 40 years.

Sol.69.(c) Let the present age of Ramu and Sunil be 7x and 9x.
$9x - 7x = 8 \Rightarrow 2x = 8 \Rightarrow x = 4$
Hence, the present age of Ramu
= 7x = 28 years.

Sol.70.(a) Sum of the present ages of Ram, Nikhil and Aswin = 111 years
As per question,
2x + 10 + 3x + 10 + 4x + 10 = 111
9x + 30 = 111 ⇒ 9x = 81 ⇒ x = 9
Present age of Nikhil
= 3x + 10 = 3 × 9 + 10 = 37

Sol.71.(d) Let the years = n
(50 + n) = (22 + n) × 2
50 + n = 44 + 2n ⇒ n = 6

Sol.72.(b) Let present age of Krishna = x
According to the question,
$(x - 10) = (x + 20) \times \frac{1}{3}$
3x - 30 = x + 20 ⇒ 2x = 50 ⇒ x = 25
So, present age of krishna = 25

Sol.73.(b) Let the Brijesh's age = x
William's age = 20 - x
According to question,
(x - 4) × 2 = (20 - x - 4)
2x - 8 = 16 - x
3x = 24 ⇒ x = 8
William age = 20 - x = 20 - 8 = 12

Sol.74.(b) Let, age of son (5 years hence) = x, Ramesh = 3x
Present age of son = x - 5, and Ramesh = 3x - 5
According to the question,
3x - 5 - 5 = (x - 5 - 5) × 7
3x - 10 = 7x - 70 ⇒ 4x = 60 ⇒ x = 15
Present age of Ramesh = 3x - 5
= 3(15) - 5 = 40

Sol.75.(b) Let 3 years ago, the age of Jacob's son be x years old and Jacob's age was 7x Present age of Jacob = 7x + 3 and present age of his son = x + 3
After 5 years,
$7x + 3 + 5 = 4(x + 3 + 5)$
$\Rightarrow 7x - 4x = 32 - 8$
$\Rightarrow 3x = 24 \Rightarrow x = 8$
Hence, the present age of his son = 8 + 3
= 11 years and present age of Jacob
= 7x + 3 = 59 years.

Sol.76.(c) Let the present age of Radha and Murari be x and y respectively.
$x - y = 12 \ldots\ldots\ldots (1)$
$(x - 5) + (y - 5) = 28 \Rightarrow x + y = 38 \ldots\ldots\ldots (2)$
By solving eq . (1) and (2) we get x = 25 and y = 13
Hence, the present age of Murari is 13 years.

Sol.77.(b) Present age of A : B = 7 : 3
According to question,
$\frac{7x - 4}{3x + 4} = \frac{2}{1} \Rightarrow$ 6x + 8 = 7x - 4 ⇒ x = 12
Present age of A = 7x = 7 × 12 = 84
Present age of B = 3x = 3 × 12 = 36
Required difference = (84 + 4) - (36 - 4)
= 88 - 32 = 56 years

Sol.78.(b) Five years ago, Sum of the ages of A and B = 58
Present age of A and B = 58 + 5 + 5 = 68
Let the age of A = x and B = 68 - x
According to question,
(68 - x - 8) - (x + 8) = 16
60 - x - x - 8 = 16 ⇒2x = 36 ⇒ x = 18
Present age of A = 18
Present age of B = 68 - 18 = 50
Required ratio = 18 : 50 = 9 : 25

Sol.79.(a) Let the present ages of Monu and Sonu be 3x and 4x.
$\frac{3x - 5}{4x + 5} = \frac{2}{5}$
$\Rightarrow 5(3x - 5) = 2(4x + 5)$
$\Rightarrow 15x - 25 = 8x + 10$
$\Rightarrow 15x - 8x = 10 + 25 \Rightarrow 7x = 35$
$\Rightarrow x = 5$
Hence, the present age of Monu is 15 years.

Sol.80.(a) Let the present ages of Somu and Ranu be 5x and 4x.
$5x + 4x = 27 \Rightarrow 9x = 27 \Rightarrow x = 3$
Present age of Somu and Ranu is 15 years and 12 years,
After 8 years , Somu : Ranu = 23 : 20

Sol.81.(c) 5 years ago, let the age of Preethi was x years and the age of Roshan was 3x.
Present age of Preethi is x + 5 years and age of Roshan is 3x + 5
According to the question
$(3x + 5) - (x + 5) = 6$
$\Rightarrow 2x = 6 \Rightarrow x = 3$
Hence, the present age of Preethi is
3+ 5 = 8 years.

Sol.82.(c) Let the present age of Vanraj's son be x years.
Then, Vanraj's age = 3x and her daughter's age = (x - 3)
Now, $x + x - 3 + 3x - 9 = 63$
$\Rightarrow 5x - 12 = 63$
$\Rightarrow 5x = 75 \Rightarrow x = 15$
Hence, the present age of Vanraj
= 3x = 45 years.

Sol.83.(b)
Let the age of Rimmy be x years , rosy = (x + 1) years. Rani = (x + 2) years
Then, $x + x + 1 + x + 2 = 48$
$\Rightarrow 3x = 48 - 3$
$\Rightarrow 3x = 45 \Rightarrow x = 15$
Hence, the age of Rosy = 16 years.

Sol.84.(d) let, the sum of present ages of her two sons = x
So, present age of Shalini = 4x
ATQ,

$\frac{4x+6}{x+6+6} = \frac{2}{1}$
⇒ 4x + 6 = 2x + 24
⇒ 2x = 18
Now, x = 9
Therefore present age of shalini (4x)
= 4 × 9 = 36 years

Sol.85.(b)

	P	:	Q
Present age →	5	:	4
9 year ago →	2	:	1

Difference between age (5 - 2) units = 9 years
So, 1 unit = 3 year
Therefore, sum of present age
=(5 + 4) × 3 = 27 years

Sol.86.(c) Let the age of elder = x and younger's age = x - 14
According to the question,
(x - 4) = 3 × (x - 14 - 4) ⇒ x - 4 = 3x - 54
2x = 50 ⇒ x = 25
Present age of younger one = x - 14
= 25 - 14 = 11 years

Sol.87.(d)
Let the age of son 16 years ago = x
Then father's age 16 years ago = 4x
Present age of son = x + 16 and present age of father = 4x + 16
According to the question,
(x + 16) × 2 = 4x + 16
2x + 32 = 4x + 16 ⇒ 2x = 16 ⇒ x = 8
Present age of father = 4x + 16
= 4(8) + 16 = 48 years
Present age of son = x + 16 = 8 + 16
= 24 years
Required difference = 48 - 24 = 24 years

Sol.88.(a) 5 years ago,
Let Kiran's age = x ⇒ Arun's age = 5x (given in the statement)
Now, Difference between the age of Arun and Kiran = 20 years
(5x + 5) – (x + 5) = 20 ⇒ 4x = 20 ⇒ x = 5
Hence, present age of Arun = 5x + 5
= 5(5) + 5 = 30 years

Sol.89.(b). According to the question,
6B + 5W = 43……(i)
5B + 5W = 40…….(ii)
On solving equation (i) and (ii)
B = 3 and W = 5
Hence, age of B = 3 years

Sol.90.(b) One year ago,
Let the age of daughter = x and Praveena's age = 4x , 6 years from now,
Daughter's age = x +7
Parveena 's age = 4x + 7
According to the question,
(4x + 7) – 2(x + 7) = 7
4x + 7 – 2x – 14 = 7 ⇒ 2x = 14 ⇒ x = 7
Sum of their present age = (4x +1) + (x + 1) = 5x + 2 = 5 × 7 + 2 = 37 years

Sol.91.(b) Let the present age of daughter = x and father's age = 3x + 5
According to the question,
(x + 4) × 2 + 8 = (3x + 5 + 4)
2x + 16 = 3x + 9 ⇒ x = 7
Hence, the present age of daughter = **7** years

Sol.92.(a) Let the present age of mother = x and present age of son = y
x - y = 30…….(i)
According to question,
(x - 15) = 2(y - 15) ⇒ x - 15 = 2y - 30
x - 2y = -15….(ii)
On solving the equations,
y = 45 , x = 75
So, present age of mother = 75 years

Sol.93.(d)
Sum of kamal and vishnu's age = 60
6 years ago, sum of kamal and vishnu's age = (60 - 12)= 48
Ratio of age 6 years ago
→ kamal : vishnu
5x : x
6x = 48 ⇒ x = 8
Then ,the present age of Vishnu = 8 + 6 = 14 years.

Sol.94.(a) Let the age of son = x years then, age of Kamal = 4x
According to the question,
$(4x + 18) \times \frac{1}{2} = x + 18$
4x + 18 = 2x + 36 ⇒ 2x = 18 ⇒ x = 9
So, present age of the son = 9 years

Sol.95.(a) Let the age of Vikram = x
Age of Raja = 13x
According to the question,
(x + 10) × 3 = 13x + 10
3x + 30 = 13x + 10
10x = 20 ⇒ x = 2
So, the present age of Vikram = 2 years

Sol.96.(a) 8 years ago, Age of Mohan = x and Raghu's age = 3x
According to question,
3x + 8 + 8 = 2(x + 8 + 8)
3x + 16 = 2x + 32 ⇒ x = 16
Present age of Mohan = x + 8
= 16 + 8 = 24
Present age of Raghu = 3x + 8
= 3(16) + 8 = 56
Required ratio = 24 : 56 = 3 : 7

Sol.97.(a)
Ratio of ages of M and N = 3 : 2
According to the question,
3x × 2x = 486 ⇒ $6x^2$ = 486 ⇒ x = 9
Age of M = 3x = 3 × 9 = 27
Age of N = 2x = 2 × 9 = 18
Sum of ages of M and N = 27 + 18 = 45

Sol.98.(b) Let age of Vishnu = x
Age of Kamal = 3x
Age of Deeksha = x - 3
According to the question,
(x - 3) + (3x - 3) + (x - 3 - 3) = 63
5x - 12 = 63 ⇒ 5x = 75 ⇒ x = 15
So, present age of Kamal = 3x
= 3 × 15 = 45

Sol.99.(a) According to question,
Rajesh's father's age = 60 years
Rajesh's age = $60 \times \frac{3}{5}$ = 36 years
Rajesh's wife's age = $36 \times \frac{3}{4}$ = 27 years
Rajesh's daughter's age = $27 \times \frac{1}{3}$
= 9 years

Sol.100.(d) Let Arvind's age = x
Avinash's age = 5x
According to question,
(x + 4) × 4 = (5x + 4)
4x + 16 = 5x + 4
x = 12
Arvind's age = 12
Avinash's age = 5x = 5 × 12 = 60
Average of their present ages
$= \frac{60+12}{2}$ = 36

Sol.101.(d)
Sum of age of x, y and z = 3 × 44 = 132
Sum of age of x and y = 2 × 38 + 2 × 8
= 92
Age of z = 132 - 92 = 40 years

Sol.102.(a) Sum of present age of A, B and C = 3 × 17 + 3 × 5 = 66
Sum of present age of A and B = 2 × 17.5 + 2 × 7 = 49
Present age of C = 66 - 49 = 17
Age of C after 2 years = 17 + 2 = 19

Sol.103.(d) Teacher's age
= (13 × 35) - (12 × 34) = 455 - 408
= 47 years

Sol.104.(c)
let Subhash's present age be x
then equation = (x + 8) = 3(x)
= x + 8 = 3x
= 2x = 8 = x = 4
Age 5x = 20
Hence, after (20 - 4) = 16 years, Subhash's age will be 5 times.

Sol.105.(d) Let the present ages of Sheo kumar and Dileep kumar
= 9x and 10x years
A/Q ,

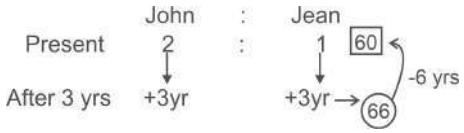
$\Rightarrow \frac{9x+11}{10x+11} = \frac{10}{11}$
$\Rightarrow 99x + 121 = 100x + 110 \Rightarrow x = 11$
Present age of Sheo Kumar
$= 9 \times 11 = 99\ years$
Present age of Dileep Kumar
$= 10 \times 11 = 110\ years$

Sol.106.(b) Let the present age of Sujata = S, and present age of Vanita = V
According to the question,
3S - 2V = 5 ....(1)
After 3 year ,
4(S + 3) - 3(V + 3) = 4
⇒ 4S +12 - 3V -9 = 4
⇒ 4S - 3V = 1 .....(2)
After multiplying equation (1) with 3 and equation (2) with 2
9S - 6V = 15 ....(1)
8S - 6V = 2 .....(2)
S = 13
By putting value of S in equation (1)
Then age of Vanita, 39 - 2V = 5
⇒ V = 17
Therefore value of k = 17-13 = 4

Sol.107.(a) 10 year ago, Ratio of the age between Z : P → 18 : 26
But, at present Ratio of age between
Z : P → 28 : 36 = 7 : 9

Sol.108.(a) Total age of Aditi, Aditya, and Adya = 120 years
3 years ago the age of each person was 3 years less than now.
Total less = $3 \times 3 = 9$ years
3 years ago, Sum of ages of Aditi, Aditya, Adya = 120 - 9 = 111 years

Sol.109.(c) Let the age of Jean = x years
Age of John = 2x
A/Q ,
⇒ x + 3 + 2x + 3 = 66
⇒ 3x + 6 = 66 ⇒ 3x = 60 ⇒ x = 20
Age of Jean = 20 years
Age of John = 40 years
Short Tricks:-



3 unit = 60 yrs
Then , Age of Jean (1 unit) = 20 years
Age of John (2 units) = 40 years

Sol.110.(b)
Let the age of Narendra = x years
Age of his mother = 4x
A/Q ,
6(x - 4) = 4x - 4
⇒ 6x - 24 = 4x - 4 ⇒ 2x = 20 ⇒ x = 10
Age of Narendra = 10 years ,
Age of his mother = 40 years

Sol.111.(c)
Let the present age of Alok = 3x
Present age of Anil = 4x
A/Q ,
3x + 20 = 62 ⇒ 3x = 42 ⇒ x = 14
Present age of Anil = $4 \times 14 = 56\ years$

Sol.112.(b)

Sum of the Father and son age, 7 years ago = 56 - (7 + 7) = 42 years
Now , 7 years ago
6 unit = 42 years
Father age = 5 units = 35 yrs.
Son = 1 unit = 7 yrs
For present -
Father = 35 yr. + 7 yr . = 42 years
Son = 7 yr + 7 yr. = 14 years.

Sol.113.(d) According to the question,
$\Rightarrow \frac{7x+9}{8x+9} = \frac{8}{9}$
⇒ 63x + 81 = 64x + 72 ⇒ x = 9
Hence , present age of ram = 7x = 7 × 9
= 63 years
And present age of shyam = 8x = 8 × 9
= 72 years

Sol.114.(b)

A/Q ,
$\Rightarrow \frac{13x+12}{9x+12} = \frac{4}{3}$
⇒ 39x + 36 = 36x + 48 ⇒ 3x = 12 ⇒ x = 4
Present age of ram = 13x + 4 = 56
Present age of shyam
= 9x + 4 = 36 + 4 = 40
The difference (in years) between their present ages = 56 - 40 = 16 yrs

Sol.115.(d) Sum of ages of A and B = 56 years (3 years ago)
Sum of ages of A and B at present
= 56 + 6 = 62 years
Sum ages of A ,B and C
$= 3 \times 42 = 126\ years$
Age of C = 126 - 62 = 64 years

Sol.116.(d) Let the present age of Z = x years, Then age of Y = 2x , age of X = 2x + 2 ,Now, $(2x + 2) + 2x + x = 27$
$\Rightarrow 5x = 25$, $\Rightarrow x = 5$
Hence, the present age of Y=(2x)
= 10 years.

Sol.117.(d)
Let the present age of Rajan = x years
According to question,
$(x - 8) = \frac{5}{6}x \Rightarrow x - \frac{5}{6}x = 8$
$\Rightarrow \frac{x}{6} = 8 \Rightarrow x = 48$
So, the present age of his sister
= 48 - 10 = 38 years.

Sol.118.(a) Let the ages of two sister one year ago be 2x and 3x
A.T.Q . ,
2x + 1 + 3x + 1 = 12 ⇒ 5x = 10 ⇒ x = 2
So, their present ages → 2 × 2 + 1
= 5 yrs. and 3 × 2 + 1 = 7 yrs.

Sol.119.(a) Let the present age of sundar and Seema = 5x and 4x
A/Q ,
$\frac{5x+3}{4x+3} = \frac{11}{9} \Rightarrow 45x + 27 = 44x + 33$
$\Rightarrow x = 6$
The present age of seema → 4x = 24 years

Sol.120.(a)
Given, age ratio of A and B = 4 : 3
A's age after 6 year = 26 year
So Now A's age is = 26 - 6 = 20 year
It means 4 ratio = 20 ⇒ 1 ratio = 5
Hence B's present age
= 3 ratio = 3 × 5 = 15 years.

Sol.121.(d)
Let the age of P, Q and R is 4x, 7x and 9x
According to the question,
9x - 8 = 7x ⇒ 2x = 8 ⇒ x = 4
So, sum of their present age is
4x + 7x + 9x = 20x = 20 × 4 = **80**

Sol.122.(d) Let the age of children be (x) , (x + 4) , (x + 8) , (x + 12) and (x + 16)
According to the question ,
(x) + (x + 4) + (x + 8) + (x + 12) + (x + 16) = 80 ⇒ 5x + 40 = 80 ⇒ x = 8
Now, the age of the eldest child (x + 16) = 24 yrs.

Sol.123.(a)
Let their ages be x , 3x , 4x and 6x .
ATQ , x + 3x + 4x + 6x = 42 × 4
14x = 168 ⇒ x = 12
Now, difference b/w eldest and youngest
⇒ 6x − x = 5x → 5 × 12 = 60 yrs.

Sol.124.(b)
Let the age of P and Q are x and y
According to question ,
$\frac{x-6}{y-6} = \frac{6}{5}$ → 5x - 30 = 6y - 36
→ 5x - 6y = -6 **—------eq .(1)**
$\frac{x+4}{y+4} = \frac{11}{10}$ → 10x + 40 = 11y + 44
→ 10x − 11y = 4 **—------eq .(2)**
Solving the eq .(1) and eq .(2)
y = 16 year and x= 18 year

Sol.125.(a)
Ratio of the age of a and b is 3:5
Given that difference of their age is 6 then

2 unit = 6, the sum of their age
$= \frac{6}{2} \times 8 = 24$

Sol.126.(d)
Let age of grandfather is x year
And grandson,s age = sister age + 6 ⇒ 11
According to question,
$\frac{x-4}{5} = 11 \Rightarrow x = 59$ year

Sol.127.(c)
Ratio of age of two brother → 3 : 2
Difference (1 unit) = 7 year
So , sum of their age = 5 × 7 = 35 year

Sol.128.(b) Let current age of the both family members be x and y
According to the question,
(x + 4) + (y + 4) = 64 → x + y = 56---------(I)
And $\frac{x-4}{y-4} = \frac{3}{1}$ → 3y - x = 8----------(II)
With the help of equation (I and II)
3y - 8 + y = 56 → y = 16
X = 56 - 16= 40
So, the age of younger member of the family = 16years

Sol.129.(c)
Let the age of the childrens be x and y
According to the question,
X + y = 33 and x - y = 3 → x =18, y = 15
so , the age of elder child = 18 years

Sol.130.(b) According to question,
Five year ago, sum of the Age of couple = 48
Present age of the couple = 48 + 10 = 58
Sum of the present age of the couple and and a child = 60
So , age of the child = 60 - 58 = 2 years

Sol.131.(a) Let the present age of father be x years, According to the question,
(x - 12) = 3 × (12), ⇒ x = 48 years.

Sol.132.(d) Let the age of grand father and grand daughter is 9x and 2x respectively
According to the question ,
Difference of their ages
→ $(9x - 2x) = (7x)$
Now , 7x is divisible by 11
Let x = 11 , then the difference in their ages = 77 yrs.
Sum of their ages → (9x + 2x) = 121 , which is clearly a perfect square .
So , their ages are 9x = 99 yrs , and
2x = 22 yrs.

Sol.133.(a) Let the ages of two brothers be x and y
$\Rightarrow \frac{x+y}{x-y} = \frac{5}{1} \Rightarrow$ x = 3 units and
y = 2 units
Now , According to the question , (let x= 3k and y = 2k)
xy = 6 k^2 = 96 years ⇒ k = 4 yrs.
Their ages will be 8 yrs. and 12 yrs.

Sol.134.(a)
Let, age of sisters are 4 units and 5 units
According to question
(4 + 5) units = 81 years
⇒ 9 units = 81 years
One sister younger than the other
(1 unit) = 9 years.

Sol.135.(a) Let , age of son = (x)
and age of father = y,
x + y = 45 .....e.q.(1)
According to question ,
$(x - 5) \times (y - 5) = (y - 5) \times 4$
$(x - 5) = 4 \Rightarrow x = 9$
Present age of father = 45 - 9 = 36 years

Sol.136.(c) Let , the age of son = x years and age of father = 5x
According to question,
$(5x - 5) = (x - 5) \times 6$
$5x - 5 = 6x - 30 \Rightarrow x = 25$ years

Sol.137.(c) Let the age of C be x yrs.
Then the age of B = $2x$
and age of A = $2x + 2$
According to the question,
A + B + C = 27 → $5x + 2 = 27 \Rightarrow x = 5$ yrs.
Age of B ($2x$) = 10 yrs.

Sol.138.(b) Given ,
A + B = B + C + 12 ⇒ A - C = 12
Here C is younger than A by 12yr.

Sol.139.(a) Let 5 years ago, Y's age be y years, and X's age = 3y
10 years later,
According to question ,
$2(y + 15) = 3y + 15$
$2y + 30 = 3y + 15$
$\Rightarrow y = 15$
Present age of X → 3y + 5 = 50 years.

Sol.140.(a) 5 years ago, Rohan's age was x years.
Then, his father's age = 8x
ATQ, $\frac{8x+5+5}{x+5+5} = \frac{10}{3}$
$24x + 30 = 10x + 100$
$14x = 70 \Rightarrow x = 5$
Hence, the present age of Rohan
→ 5 + 5 = 10 years

Sol.141(c) Let the present age of son be x and father's age be 45 − x .
According to question ,
$\frac{45-x-5}{x-5} = \frac{6}{1}$
$40 - x = 6x - 30 \Rightarrow 7x = 70 \Rightarrow x = 10$
Hence, the present age of his father
= 45 - 10 = 35 years

Sol.142.(c)

Ratio of ages →	Anu	:	Dimpy
Present age →	5	:	8
+2 years →	2	:	3)×3

Difference b/w their ages (1 unit) = 2yrs
So , the present age of dimpy (8 units) = 16yrs.
⇒ Dimpy age 2 years ago = 14 yrs.

Sol.143.(d) Let the ages of four childs be x, x - 2 , x - 4 and x - 6 years .
Sum of their ages is 28
Therefore , (x + x - 2 + x - 4 + x - 6) = 28
4x = 40 → x = 10
So, the age of the smallest child is (x - 6) = 4 years.

Sol.144.(d) Ratio of Ram's and Raj's age = 4 : 5
Sum of their ages ⇒ 9 unit = 126
Difference of their ages ⇒ 1 unit = 14

Sol.145.(b) Let the present age of Mohinder and Virat be x and y yrs respectively
ATQ ,
Y + 7 = 2(x + 7) ⇒ Y + 7 = 2x + 14
y - 2x = 7 -------- (1)
And, $(x - 5) = \frac{2}{5}(y - 5) - 1$
$x - 4 = \frac{2}{5}(y - 5) \Rightarrow 5x - 20 = 2y - 10$
5x - 2y = 10 -------- (2)
Adding eqn. (1) × 2 and (2) we have :
x = 24 yrs and y = 55 yrs
So, Virat's present age = 55 yrs

Sol.146.(d) Let the present age of Dharitri and Eunice be x and y respectively
ATQ,
x + y = 61 and, (x + 3) = 2(y + 3) - 8
⇒ x + 3 = 2y + 6 - 8 ⇒ x - 2y = -5
⇒ x + y - 3y = -5 ⇒ 61 - 3y = -5
3y = 66 ⇒ y = 22
So the age of Dharitri = 61 - 22 = 39 yrs

Sol.147.(c) Let my and my cousin's current age are x and y respectively
ATQ,
$\frac{3}{5}x = \frac{5}{6}y \Rightarrow \frac{x}{y} = \frac{5}{6} \times \frac{5}{3} = \frac{25}{18}$
Also, (x - 10) = (y + 4)
x - y = 14 ⇒ (25 - 18) unit = 14
⇒ 7 unit = 14 ⇒ 1 unit = 2
So, my current age is = 25 × 2 = 50 yrs

Sol.148.(b) Let the age of elder and younger cousin be x and y respectively
ATQ,
x + y = 46 And,(x - 8) = 2(y - 8)
⇒ x - 8 = 2y - 16 ⇒ x - 2y = -8
⇒ x + y - 3y = -8 ⇒ 46 - 3y = -8
⇒ 3y = 54 ⇒ y = 18 yrs

So, the present age of elder cousin
= 46 - 18 = 28 yrs

Sol.149.(d) Let the present age of Krish and Parthiv be x and x + 5 yrs
ATQ,
3(x - 8) = 2(x + 5 - 8) + 10
3x - 24 = 2(x - 3) + 10
3x - 24 = 2x - 6 + 10
x = 4 + 24 = 28 yrs
So,the present age of Krish = 28 yrs

Sol.150.(b) Balancing the given ratio, we have :
Sai Satish Current age $5_{\times 2} : 4_{\times 2} = 10 : 8$
Three years hence, their age → 11 : 9
Here, 1 unit i.e, (11 - 10) = 3 yrs
Then, 8 unit = 3 × 8 = 24 yrs
So, the present age of Satheesh = 24yrs

Sol.151.(c) Let the present age of Poojitha be x ATQ,
$\frac{1}{3}(x - 3) + \frac{1}{2}(x + 2) = 20$
$\Rightarrow \frac{1}{3}x - 1 + \frac{1}{2}x + 1 = 20$
$\Rightarrow \frac{5x}{6} = 20 \Rightarrow x = \frac{20 \times 6}{5} = 24$ yrs

Sol.152.(c) Let the present age of Preeti and Peter be x and x + 5
ATQ,
⇒ 5(x - 35) = 4(x + 5 - 35)
⇒ 5x - 175 = 4(x - 30)
⇒ 5x - 175 = 4x - 120
⇒ x = -120 + 175 = 55 yrs
The current sum of their ages
= 2x + 5 = 2 × 55 + 5 = 115yrs

Sol.153.(b) Let the age of Ram and Sunny be x and y respectively
ATQ ,
(x - 13) = 2(y - 13) ⇒ x - 13 = 2y - 26
x - 2y = -26 + 13 = -13 ------- (1)
And, $(y + 3) = \frac{3}{5}(x + 3)$
5y + 15 = 3x + 9 ⇒ 3x - 5y = 6 ------- (2)
Subtracting eqn(2) from (1) × 3. we get :
y = 45 yrs and x = 77 yrs
So, Ram's current age = 77 yrs

Sol.154.(a) Let the present age of Roshan and Usha be x and y respectively
ATQ ,
$x = \frac{3}{2}y - 3 \Rightarrow 2x = 3y - 6 \Rightarrow 3y - 2x = 6$
$y = \frac{6 + 2x}{3}$ Also, $(y - 12) = \frac{1}{2}(x - 12) + 3$
⇒ 2(y - 12) = x - 12 + 6
⇒ 2y - 24 = x - 6 ⇒ 2y - x = 18
$2(\frac{6 + 2x}{3}) - x = 18$ (putting value of y)
⇒ 12 + 4x - 3x = 54 ⇒ 12 + x = 54
x = 54 - 12 = 42 yrs
So, the age of Roshan = 42 yrs

Sol.155.(b)
Balancing the given ratio, we have :
Current age of Ram and his father
$= 1_{\times 3} : 2_{\times 3} = 3 : 6$
Eight years ago, their age = 2 : 5
Here, 3 - 2 = 1 unit = 8yrs
Then, 3 unit = 8 × 3 = 24 yrs

Sol.156.(d) Let the present age of father and his son be x and y respectively
ATQ,
x + y = 60 ⇒ And, x - 6 = 5(y - 6)
x - 6 = 5y - 30 ⇒ x - 5y = -24
x + y - 6y = -24 ⇒ 60 - 6y = -24
6y = 84 ⇒ y = 14
So, the age of the son after 6 years
= 14 + 6 = 20 yrs

Sol.157.(b) Age of Monika's mother,when her brother was born = 36 yrs
Age of Monika's father, when her brother was born = 38 + 4 = 42 yrs
So, the required difference
= 42 - 36 = 6 yrs

Sol.158.(d) Let the present ages of Kavitha, Rajitha and Haritha be 4x, 7x and 9x respectively
ATQ,
(4x + 7x + 9x) -8 × 3 = 56
20x - 24 = 56 ⇒ 20x = 80
$x = \frac{80}{20}$ = 4 yrs
So, their present ages are 4 × 4 = 16 yrs, 7 × 4 = 28 yrs, 9 × 4 = 36 yrs

Sol.159.(d) Let the age of Sai be x
Then, the age of Goutham = 2x
And the age of Satheesh = 2x + 2
ATQ,
x + 2x + 2x + 2 = 27 ⇒ 5x = 25
$x = \frac{25}{5} = 5$
So, the age of Goutham = 5 × 2 = 10 yrs

Sol.160.(b) Let the age of Jeremy be x
Then, the age of Jeremy's father = x+26
ATQ,
⇒ (x + 26) + 8 = 2(x + 8) - 2
⇒ x + 34 = 2x + 16 - 2 ⇒ x + 34 = 2x + 14
⇒ x = 34 - 14 = 20 yrs
So, the present age of Jeremy = 20 yrs

Sol.161.(a) Let my current age be 'a' and one of the cousins be 'b'
ATQ,
$\frac{2}{3}a = \frac{3}{4}b \Rightarrow 8a = 9b \Rightarrow b = \frac{8}{9}a$
Again, (a - 3) = (b + 4) ⇒ a - b = 7
$\Rightarrow a - \frac{8}{9}a = 7 \Rightarrow \frac{a}{9} = 7 \Rightarrow a = 63$ yrs
So, my current age is 63 yrs

Sol.162.(c)
Let the present age of Rihana be x
Then, the present age of Priyankur
= 3x - 7
ATQ,
$(3x - 7 + 16) = \frac{3}{2}(x + 16)$
⇒ (3x + 9)2 = (x + 16)3 ⇒ 6x + 18 = 3x + 48
⇒ 3x = 48 - 18 = 30 ⇒ 3x = 30
$\Rightarrow x = \frac{30}{3} = 10$ yrs
So, the present age of Priyankur
= 3x - 7 = 3 × 10 - 7 = 30 - 7 = 23 yrs

Sol.163.(c) Let the present age of Cynthia and Brittany be x and y respectively
ATQ,
⇒ x + y = 94
and (x - 15) = 3(y - 15)
⇒ x - 15 = 3y - 45 ⇒ x - 3y = - 30
⇒ x + y - 4y = - 30 ⇒ 94 - 4y = - 30
$\Rightarrow 4y = 94 + 30 = 124 \Rightarrow y = \frac{124}{4} = 31$ yrs
So , the present age of Brittany = 31 yrs

Sol.164.(a) Let the present age of Jina be x years. And the present age of her mother = x + 24 years.
After 8 years,
$\frac{5}{3}(x + 8) = x + 24 + 8$
$\Rightarrow 5x + 40 = 3x + 96$
$\Rightarrow 5x - 3x = 96 - 40 \Rightarrow x = 28$
Hence, the present age of Jina is 28 years.

Sol.165.(d) Let the present age of Bhaswati = x years.
Then, present age of Pinaki = x - 9
ATQ ,
$1.2(x - 9 + 13) = x + 13$
$\Rightarrow 1.2x + 4.8 = x + 13$
$\Rightarrow 1.2x - x = 13 - 4.8 \Rightarrow 0.2x = 8.2$
$\Rightarrow x = 41$
Hence, the present age of Pinaki
= 41 - 9 = 32 years.

Sol.166.(d) Let 15 years ago, Prabhat's age was x years.
And Shyam's age = 2x
⇒ present age of Shyam = 2x+15
And present age of Prabhat = x + 15
ATQ ,
$\frac{5}{8}(2x + 15 + 5) = x + 15 + 5$
$\Rightarrow 5(2x + 20) = 8(x + 20)$
$\Rightarrow 10x + 100 = 8x + 160 \Rightarrow 2x = 60$
$\Rightarrow x = 30$
Hence present age of Shyam
= 2 × 30 + 15 = 75 years

Sol.167.(d) Let the present age of Geetu be x years.
Then, Meetu's age = x + 7 and Neetu's age = x + 7 + 10
ATQ, $x + x + 7 + x + 7 + 10 = 48$
$\Rightarrow 3x = 48 - 24 \Rightarrow 3x = 24 \Rightarrow x = 8$
Hence, the present age of Neetu = x + 17
= 8 + 17 = 25 years.

Data Interpretation

It is the act of organizing and interpreting data to get meaningful information . In Data interpretation, a large volume of data is organized and is represented into a compact and precise form which is easier to interpret than the raw data.
Basic tools to solve Data Interpretation includes :

- Calculation
- Average
- Ratio
- Percentage

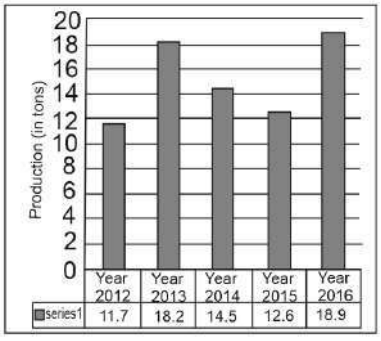
Some Important Formulae :

- Percentage increase $= \frac{Final\ value - Initial\ value}{Initial\ value} \times 100$
- Percentage decrease $= \frac{Initial\ value - Final\ value}{Initial\ value} \times 100$
- Quantity I is how much percentage of Quantity II $= \frac{QuantityI}{QuantityII} \times 100$
- Quantity I is how much percentage less than Quantity II $= \frac{QuantityII - QuantityI}{QuantityII} \times 100$
- Quantity I is how much percentage more than Quantity II $= \frac{QuantityI - QuantityII}{QuantityII} \times 100$
- Central angle of component $= \frac{Value\ of\ component}{Total\ value} \times 100$

Practice Questions

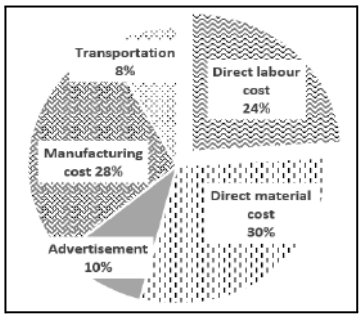
RRC Group D (17/08/2022 to 11/10/2022)

Q.1. The following chart shows the production of an organization in various years from 2012 to 2016.Study the chart and answer the question.



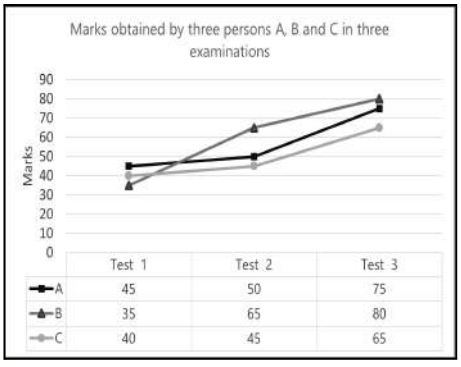
What was the percentage increase in the production from 2015 to 2016?
Group D 17/08/2022 (Morning)
(a) 50% (b) 21% (c) 40% (d) 25%

Q.2. The following pie chart shows the percentage distribution of the expenditure incurred in manufacturing a scientific calculator. Study the pie chart and answer the question.



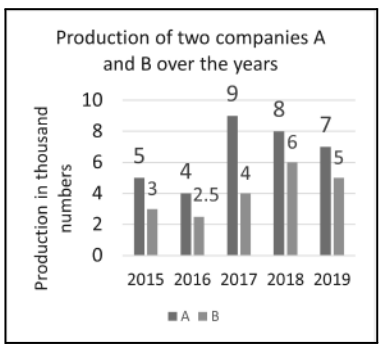
If 500 products are manufactured and the direct labour cost on them amounts to ₹1,00,000, then what should be the selling price of the product so that the manufactures can earn a profit of 44%?
Group D 17/08/2022 (Morning)
(A) ₹1,200 (B) ₹1,000
(C) ₹1,500 (D) ₹600

Q.3. The following graph and table show the marks obtained by three persons- A, B and C in three exams Exam 1 Exam 2 and Exam 3. Study the graph and table, and answer the question asked.



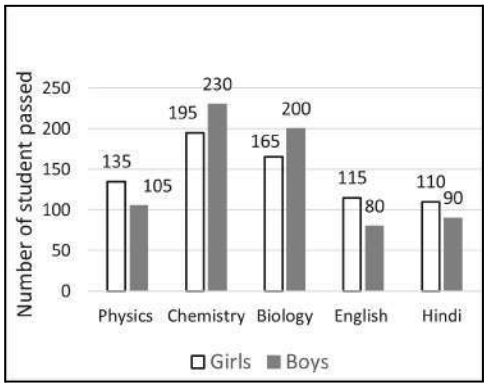
(Context- Test Exam)
If the marks for both test 1 and test 2 are 80 each, and for test 3 the rounding is 100, then considering the performance of all the three tests, A got what percent more marks than C?
Group D 17/08/2022 (Afternoon)
(a) 5.56% (b) 6.92% (c) 8.2% (d)7.69%

Q.4. Study the following graph carefully and answer the question.



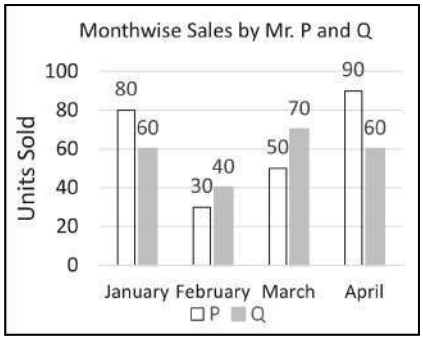
For company A, what is the approximate percentage decrease in production from 2015 to 2016?
Group D 17/08/2022 (Evening)
(a) 15% (b) 22% (c) 25% (d) 20%

Q.5. The graph and the table below show the number of boys and girls passed in five different subjects i.e. Physics, Chemistry, Biology, English and Hindi



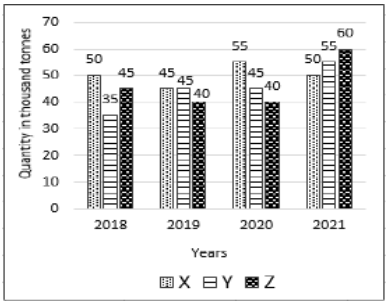
What is the ratio of the girls who have passed in Physics, Chemistry and Biology respectively?
Group D 17/08/2022 (Evening)
(a) 9 : 13 : 11 (b) 9 : 13 : 8
(c) 8 : 11 : 14 (d) 9 : 15 : 13

Q.6. The graph and the table below show the units sold by two salesmen, Mr. P and Mr. Q, in 4 months from January to April. Study the graph and the table and answer the question.



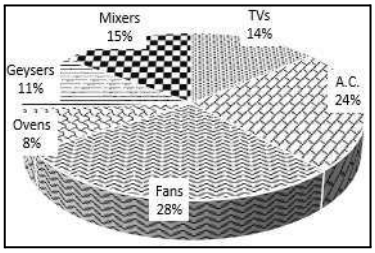
What is the respective ratio of the total units sold by Mr. P and Mr. Q during the 4 months?
Group D 18/08/2022 (Morning)
(a) 25 : 27 (b) 25 : 23
(c) 24 : 23 (d) 23 : 21

Q.7. The bar graph given below shows the data on the production of milk products (in thousand tonnes) by three branches, X, Y and Z, of a dairy product company over the years. Study the graph and answer the question.



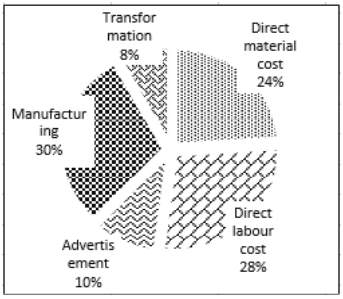
For which branch(es) of the dairy product company was the average production for the given 4 years the minimum?
Group D 18/08/2022 (Evening)
(a) Branches Y and Z (b) Branch Y
(c) Branch X (d) Branch Z

Q.8. The following chart shows the percentage of various products sold from an electronics goods shop during the year 2021. The total number of products sold from the shop during 2021 is 16800. Study the chart and answer the question.



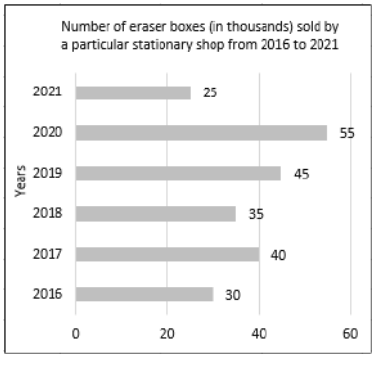
How many more Fans have been sold from the shop in comparison to Ovens during 2021?
Group D 22/08/2022 (Evening)
(a) 3566 (b) 3360 (c) 3420 (d) 3200

Q.9. The following pie chart shows the percentage distribution of the expenditure incurred in manufacturing a power bank. Study the
pie chart and answer the question.



If 100 power banks are manufactured and the manufacturing cost on them amounts to ₹50,000, then what should be the selling price of the power banks so that the manufacturer
can earn a profit of 50%?
Group D 23/08/2022 (Morning)
(a) ₹2400 (b) ₹2500 (c) ₹2200 (d) ₹3000

Q.10. Study the following bar graph carefully and answer the question.



What is the approximate percentage increase in the number of the eraser boxes sold from 2018 to 2020?
Group D 23/08/2022 (Afternoon)
(a) 45% (b) 60% (c) 50% (d) 57%

Q.11. The following chart shows the sales of the company during different years from the year 2014 to 2019. Study the chart, and answer the question asked.

During which years was the sales less than the average sales of all the six years?
Group D 24/08/2022 (Afternoon)
(a) 2014 only
(b) 2014 and 2017 only
(c) 2014, 2015 and 2016
(d) 2014 and 2015 only

RRB NTPC CBT - 2
(09/05/2022 to 17/06/2022)

Q.12. The following line graph shows the annual profit percentage earned by a car manufacturing company during the period 2007-2012.

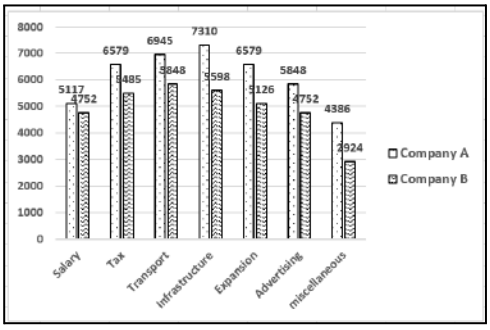
In which of the following years was the annual profit percentage closest to the average of the annual profit percentage in all the years given in the graph?
Level 6 (09/05/2022) Shift 1
(a) 2008 (b) 2009 (c) 2007 (d) 2011

Q.13. The following table presents the number of candidates trained by a training centre over 6 years (2001 to 2006).

Year	Batch 1	Batch 2	Batch 3	Batch 4	Batch 5
2001	75	144	114	102	108
2002	90	126	102	84	126
2003	96	114	75	105	135
2004	105	90	150	90	75
2005	90	75	135	75	90
2006	105	60	165	45	120

The number of candidates trained in Batch 2 in 2001 was what percentage more than the number of candidates trained in Batch 5 in 2005?
Level 6 (09/05/2022) Shift 2
(a) 32% (b) 20% (c) 60% (d) 85%

Q.14. The expenditures (in thousands) of two companies (A and B) on various heads in a given year are provided in the following bar graph.



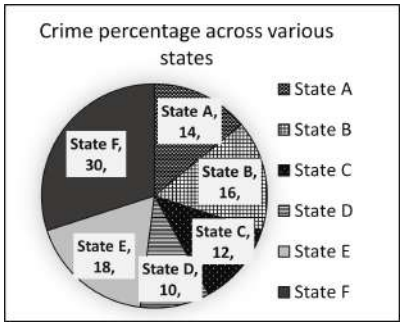
The expenditure made by both companies together on salary was approximately that percentage of their expenses on infrastructure?
Level 4 (10/05/2022) Shift 1
(a) 57% (b) 95% (c) 29% (d) 76%

Q.15. The following table presents the expenditure of a company on various heads over five years.

Expenditure of a company (in Lakhs)					
Year	Expenditure Heads				
	salary	Transport	taxes	advertising	Officers and promotions
2017	361	93	83	142	52
2018	273	67	65	133	86
2019	645	110	152	108	95
2020	712	108	165	112	48
2021	652	111	132	101	75

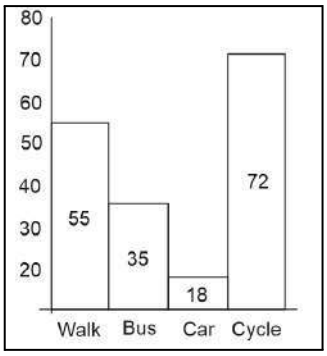
The company's total expenditure in 2017 was approximately what percentage of total expenditure is 2021?
Level 5 (12/06/2022) Shift 1
(a) 68% (b) 71% (c) 61% (d) 55%

Q.16. The following pie chart shows the percentage of crime cases reported in a particular year across various states.



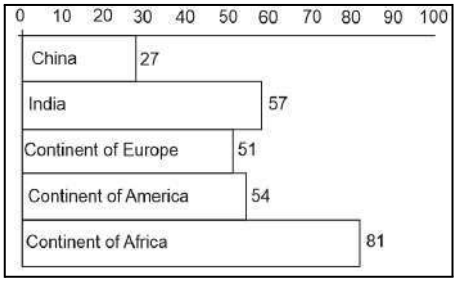
If the crime cases in state A (14% in the pie chart) were 672 in that year, what was the number of cases reported in state C and state F together?
Level 5 (12/06/2022) Shift 2
(a) 1060 (b) 800 (c) 2016 (d) 1214

Q.17. The following graph shows the number of employees using different modes of transport to reach their workplace.



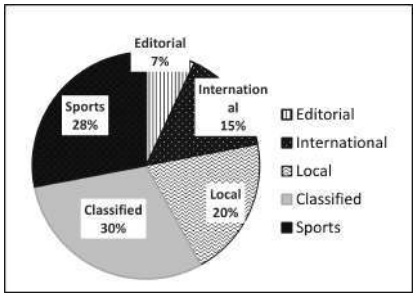
The number of employees who walked to work was approximately what percentage more than those who travelled by bus?
Level 2 (13/06/2022) Shift 1
(a) 45% (b) 57% (c) 35% (d) 18%

Q.18. The following graph represents the number distribution of all the directors in the film industry of country X by their birth origin.



What is the ratio of the number of directors from the continent of America to the total number of directors?
Level 2 (13/06/2022) Shift 2
(a) 1 : 6 (b) 1 : 5 (c) 1 : 3 (d) 1 : 4

Q.19. Study the given pie-chart and answer the question that follows.
A newspaper decided to bring its golden jubilee issue consisting of 60 pages. The proportion for the coverage of various types in this issue was pre-decided and the same is given in the pie-chart.



How many pages were dedicated to sports and editorial coverage?
Level 3 (14/06/2022) Shift 1
(a) 18 (b) 20 (c) 19 (d) 21

Q.20. Given is the data on the weights of some students. What is the mean weight(in kg) of all these students taken together?

No. of Students	Weights of the Students (in kg)
5	31
7	25
6	20
4	35
3	20

Level 3 (14/06/2022) Shift 2
(a) 22 (b) 26 (c) 23 (d) 28

Q.21. The following table depicts the number of people in 4 different villages (A, B C and D), and the ratio of literate to illiterate people in those villages.

Village	Population	Literate : Illiterate
A	1500	2 : 3
B	4000	11 : 9
C	3000	13 : 2
D	5500	4 : 1

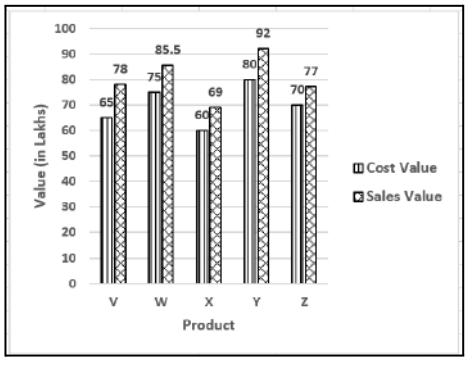
What is the percentage of literate people in all the four villages together?
Level 5 (15/06/2022) Shift 1
(a) 67% (b) 65% (c) 72% (d) 70%

Q.22. The given chart represents the import of various consumer goods (in Lakh tons) during the years 2016 - 2020.

years	Electronics	Toys	Cosmetics
2016	27	30	35
2017	15	20	33
2018	35	25	32
2019	33	25	33
2020	12	20	25

What is the ratio of the number of cosmetics imported in years 2016 and 2020 together to that of the toys in the year 2018 and 2020 together?
Level 5 (15/06/2022) Shift 2
(a) 7 : 6 (b) 5 : 2 (c) 4 : 3 (d) 3 : 1

Q.23. Study the given graph and answer the question that follows.
The graph shows the total cost and sales values(in lakhs) of five products manufactured by a company .



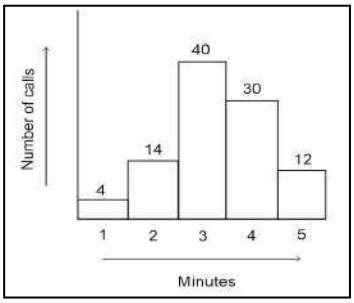
In which product has the company earned maximum profit?
Level 5 (15/06/2022) Shift 3
(a) Product X (b) Product Z
(c) Product V (d) Product W

Q.24. The loan disbursement at ABC bank in the last 5 years is as shown in the table.

Sr. No.	Year	Rupees (in Cr.)
1	2016	75
2	2017	85
3	2018	125
4	2019	145
5	2020	190

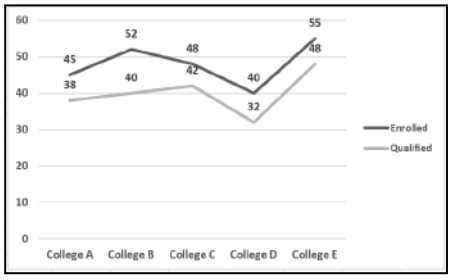
Which year has the maximum percentage growth in the loan disbursement over the previous year?
Level 2 (16/06/2022) Shift 1
(a) 2019 (b) 2018 (c) 2020 (d) 2017

Q.25. The following chart shows the number of telephone conversations at a Call Centre for various call duration on a particular day.



How many minutes of telephone conversation took place on that day?
Level 2 (16/06/2022) Shift 2
(a) 547 (b) 332 (c) 100 (d) 98

Q.26. The following graph represents the number of students enrolled and the number of students qualified in five colleges during a particular year.



What is the ratio of enrolled to qualified students across all colleges?
Level 2 (16/06/2022) Shift 3
(a) 6 : 7 (b) 13 : 3(c) 3 : 7 (d) 6 : 5

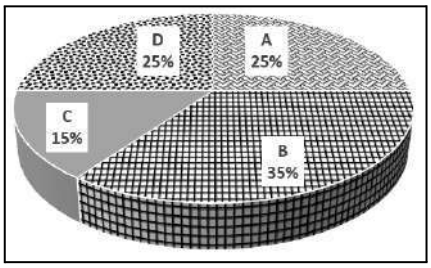
Q.27. Given is the data on the ages of the student of the class. What is the mean age of all the students taken together.

No of Students	Age of the Students
8	8
6	8
10	7

9	7
7	5

Level 3 (17/06/2022) Shift 1
(a) 7 (b) 6 (c) 5 (d) 8

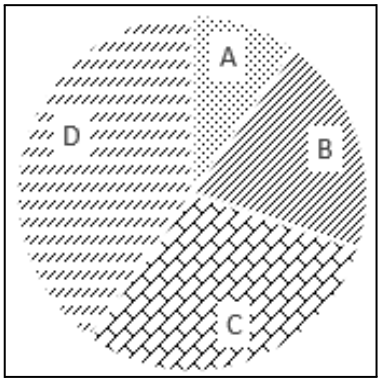
Q.28. The following pie chart shows the expenditure distribution of a college festival. A represents production expenditure, B represents lights and music system expenses, C represents advertisement expenses and D represents food expenses. Study the pie chart and answer the questions.



Approximately how much is spent on food and advertisement together if the total expenditure was ₹ 63,070?
Level 3 (17/06/2022) Shift 2
(a) ₹ 20,000 (b) ₹ 25,000
(c) ₹ 35,000 (d) ₹ 30,000

RRB NTPC CBT - 1
(28/12/2020 to 31/07/2021)

Q.29. Of the 360 students who sat for class X Board exams. 10% students scored A grade, 20% students scored B grade, 30% students scored C grade and 40% scored D grade. From the given chart, find the total number of students who scored Grade A and Grade B.



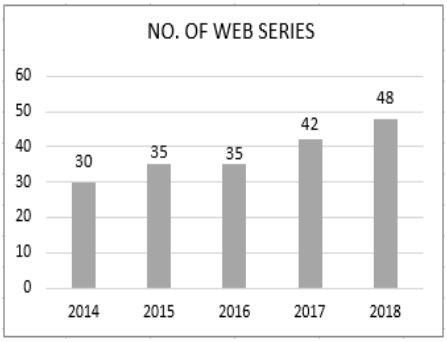
RRB NTPC 28/12/2020 (Evening)
(a) 108 (b) 144 (c) 72 (d) 36

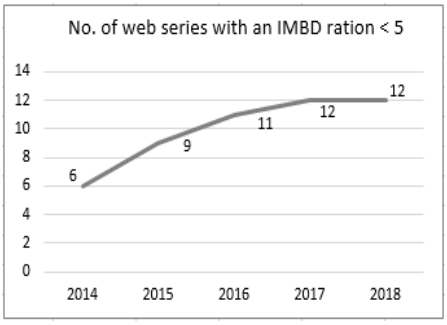
Q.30. The following table shows the Air Quality Index (AQI) (PM2.5) for the four weeks of February 2018. What is the difference in the average of AQI in Kolkata and Delhi in the month of February ?

Toxic Trend Air Quality Index		
Period	Kolkata	Delhi
February 1st - 7th	306	248
February 8th - 14th	288	246
February 15th - 21st	274	246
February 22nd - 28th	172	236

RRB NTPC 28/12/2020 (Evening)
(a) 14 (b) 18 (c) 12 (d) 16

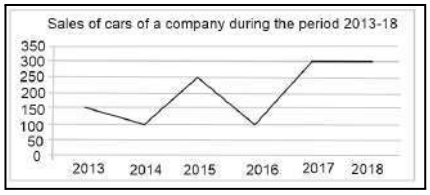
Q.31. The following bar graph shows the number of web series released by a subscription service mobile application in various years from 2014-2018 and the line graph shows the number of web series with a rating of less than 5 stars.





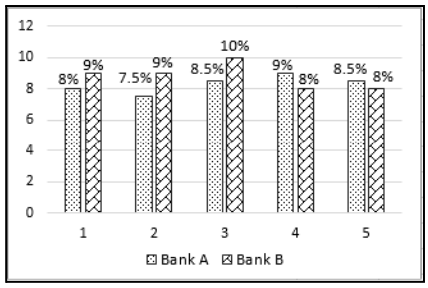
Find the approximated total percentage of web series with a rating 5 star and above from 2014 - 2018.
RRB NTPC 29/12/2020 (Morning)
(a) 74 (b) 71 (c) 75 (d) 72

Q.32. From the given diagram, determine the difference between the total number of cars sold in the first three years and in the last three years.



RRB NTPC 30/12/2020 (Morning)
(a) 1200 (b) 200 (c) 700 (d) 150

Q.33. The given chart gives interest rates offered on deposits by two banks A and B for a period of 5 years (1 - 5). What would be the difference in interest amount earned in the third year , if a person had deposited Rs.23 lakhs at the beginning of the year in bank B instead of in bank A?



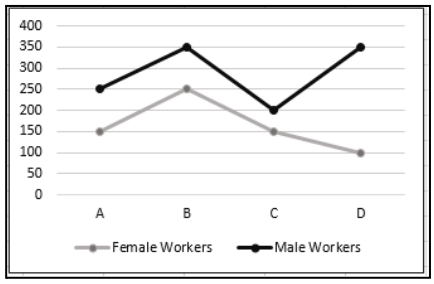
RRB NTPC 30/12/2020 (Morning)
(a) Rs. 37,600 (b) Rs. 28,800
(c) Rs. 34,500 (d) Rs. 41,200

Q.34. Observe the table and answer the question below.
The table gives the pass percentage of class X students of five government schools in Delhi on the basis of gender.

School	Pass Percentage	Ratio of boys and girls
A	35	5:6
B	32	3:5
C	24	1:2
D	19	3:2
E	15	5:3

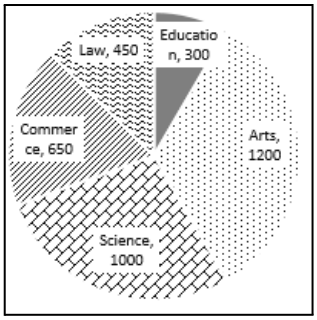
What is the ratio of pass percentage of boys of school B to that of boys of school C ?
RRB NTPC 04/01/2021 (Evening)
(a) 3 : 2 (b) 3 : 5 (c) 2 : 3 (d) 5 : 3

Q.35. Observe the graph and answer the question below.
The graph represents the number of males and female workers in four different companies.



Which company has the maximum difference in the number of male and female employees?
RRB NTPC 04/01/2021 (Evening)
(a) D (b) C (c) A (d) B

Q.36. The given pie diagram shows the number of students admitted in different faculties of a college. What part of the total students is admitted in the art faculty ?



RRB NTPC 05/01/2021 (Morning)

(a) $\frac{5}{8}$ (b) $\frac{1}{3}$ (c) $\frac{1}{12}$ (d) $\frac{1}{8}$

Q.37. The table given below gives data for wheat production (in lakh tonnes) for 5 states, from the year 2015 to 2019. Study the data given in the table and answer the question below it.

Year → / State ↓	2015	2016	2017	2018	2019
A	8	10	9	11	11
B	11	12	10	9	8
C	12	13	14	11	14
D	6	8	8	9	7
E	18	17	15	16	14

From 2015-2019, which state contributed the least to the total production of wheat?

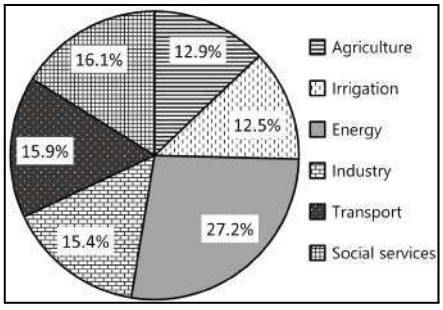
RRB NTPC 09/01/2021 (Evening)

(a) D (b) C (c) A (d) B

RRB JE
(22/05/2019 to 28/06/2019)

Q.38. Study the following pie chart and answer the question given below it.

The following pie chart represents the percentage distribution for different sectors.



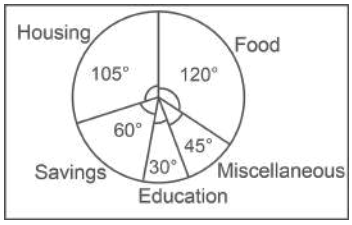
Find the angle subtended at the centre of the circle by the social services sector.

RRB JE 02/06/2019 (Morning)

(a) 70° (b) 46° (c) 45° (d) 58°

Q.39. Study the following pie chart and answer the question given below it.

The following pie chart represents the expenditure on various items and savings in a month for a family.



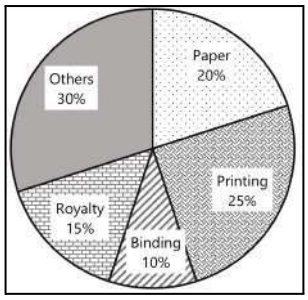
If savings in a month amount to Rs.8000, what is the total expenditure for the month?

RRB JE 26/06/2019 (Evening)

(a) Rs. 42000 (b) Rs. 40000

(c) Rs. 48000 (d) Rs. 36000

Q.40. Study the following pie chart and answer the question given below it. The following pie chart represents the expenditure incurred in publishing a book.



What is the difference in the angles of the sectors showing printing and binding expenditure in the corresponding pie-diagram ?

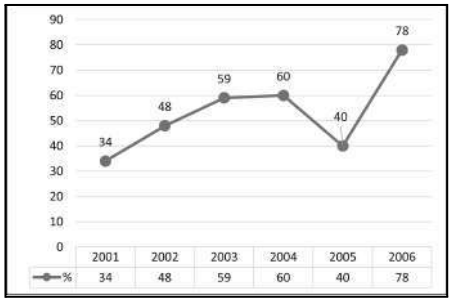
RRB JE 27/06/2019 (Evening)

(a) 30^0 (b) 36^0 (c) 126^0 (d) 54^0

RPF Constable
(17/01/2019 to 19/02/2019)

Q.41. Note : The following lines show the percentage of the number of eligible candidates in the examination compared to the total number of candidates present during the six-year period 2001 to 2006.

Which pair of below given years had a lesser percentage difference in the percentage of candidates who were eligible?

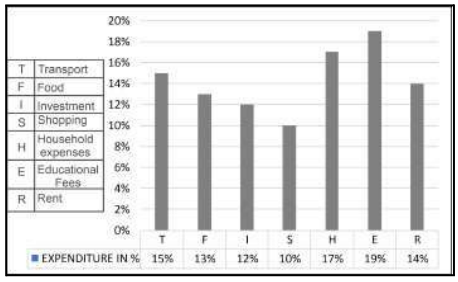


RPF Constable 17/01/2019 (Morning)

(a) 2003 - 2004 (b) 2004 - 2005

(c) 2002 - 2003 (d) 2001 - 2002

Q.42. Directions : Study the following bar graph and answer the question that follows: Total Expenditure(100%): Rs.85000 Find the amount spent on Food (F) and Household expenses (H) together.

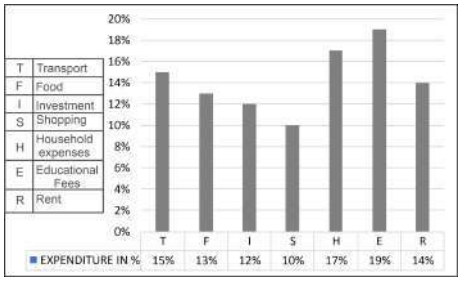


RPF Constable 18/01/2019 (Morning)

(a) Rs.24,400 (b) Rs.23,300

(c) Rs.22,200 (d) Rs.25,500

Q.43. Directions : Study the following bar graph and answer the question that follows: Total Expenditure(100%): Rs.85000 How much more money should be added to education fees so that it equals the amount spent on Rent(R) and Household expenses (H) together.



RPF Constable 18/01/2019 (Morning)

(a) Rs.10,800 (b) Rs.9,600

(c) Rs.10,200 (d) Rs.10,600

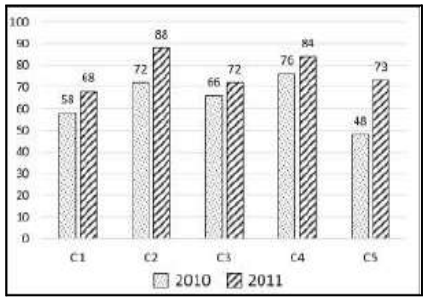
RPF S.I.
(19/12/2018 to 16/01/2019)

Q.44. Instruction:

Study the following bar graph and answer the question based on it?

The book sales (in thousand) of five branches (C1, C2, C3, C4 and C5) of a publishing company for two consecutive years 2010 and 2011 are given.

Find the average (in thousand) of the sales of all the branches in the year 2010?

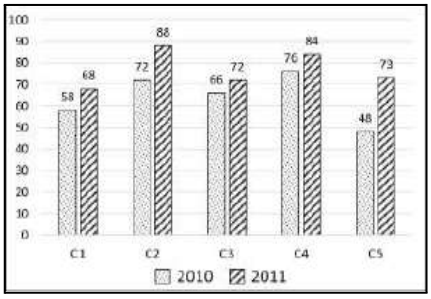


RPF S.I. 19/12/2018 (Morning)

(a) 65 (b) 64 (c) 63 (d)66

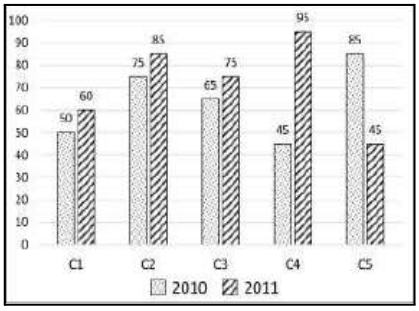
Q.45. Instruction:

Study the following bar graph and answer the question based on it.
The book sales (in thousand) of five branches (C1, C2, C3, C4 and C5) of a publishing company for two consecutive years 2010 and 2011 are given.
Find the total sales (in thousand) of the branches C1, C3 and C5 of the company in both the years together?



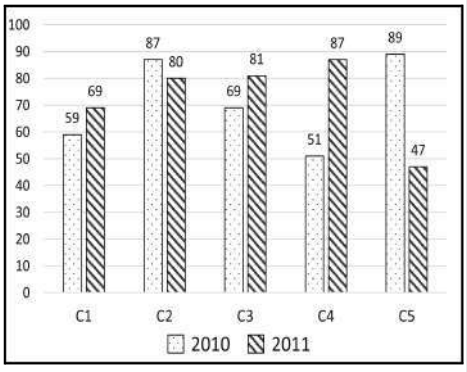
RPF S.I. 19/12/2018 (Morning)
(a) 355 (b) 365 (c) 375 (d) 385

Q.46. Direction: Study the following bar graph and answer the question based on it? The book sales (in thousand) of five branches (C1, C2 C3, C4 and C5) of a publishing company in two consecutive years 2010 and 2011 are given. Find the ratio of total sales of branch C2 in both the years to that of branch C4 in both the years?



RPF S.I. 19/12/2018 (Evening)
(a) 8 : 9 (b) 7 : 8 (c) 8 : 7 (d) 9 : 8

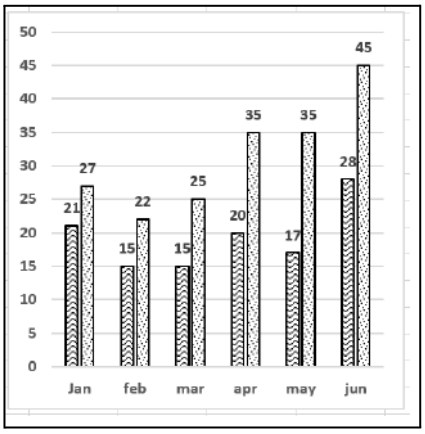
Q.47. Instruction:
Study the following bar graph and answer the question based on it.
The book sales (in thousand) of five branches (C1, C2, C3, C4 and C5) of a publishing company for two consecutive years 2010 and 2011 are given.



Find the ratio of total sales of branch C2 in both the years to that of branch C4 in both the years?
RPF S.I. 24/12/2018 (Morning)
(a) 196 : 123 (b) 123 : 196
(c) 167 : 138 (d) 138 : 167

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.48.



Jan -feb- mar -apr -may- jun
The given data shows the registration of bikes and total vehicles (in thousands) for 6 months in 2017 in City X.
Note: In the chart, the first number represents bikes and the second number represents total vehicles.
Based on the given data, from January to April 2017, the increase in the registration of vehicles other than bikes is_____
RRB ALP 09/08/2018 (Afternoon)
(a) 9000 (b) 8500 (c) 9050 (d) 8000

Q.49.

Year	Items of Expenditure			
	Salary	Food	Medicine	Tax
2001	₹1500	₹200	₹500	₹100
2002	₹2600	₹300	₹600	₹200
2003	₹3200	₹150	₹700	₹150
2004	₹4100	₹250	₹650	₹125
2005	₹5000	₹200	₹800	₹150
2006	₹5200	₹100	₹750	₹175

The ratio of salary: expenditure per year during period 2001 to 2006 is
RRB ALP 21/08/2018 (Morning)
(a) $\frac{105}{71}$ (b) $\frac{216}{61}$ (c) $\frac{71}{105}$ (d) $\frac{71}{108}$

Q.50.

Sub → Stu↓	P	C	B	M
W	70	90	50	85
X	55	80	95	60
Y	60	20	90	40
Z	90	80	40	65

The given table represents the marks obtained by four students W, X, Y and Z in four subjects P, C, B and M, with the maximum marks in each subject being 100. The student who got the highest percentage of marks in P, C, M and B combined is:
RRB ALP 31/08/2018 (Evening)
(a) X (b) Y (c) Z (d) W

Answer Key :-

1.(a)	2.(a)	3.(d)	4.(d)
5.(a)	6.(b)	7.(b)	8.(b)
9.(b)	10.(d)	11.(d)	12.(a)
13.(c)	14.(d)	15.(a)	16.(c)
17.(b)	18.(b)	19.(d)	20.(b)
21.(d)	22.(c)	23.(c)	24.(b)
25.(b)	26.(d)	27.(a)	28.(b)
29.(a)	30.(d)	31.(a)	32.(b)
33.(c)	34.(a)	35.(a)	36.(b)
37.(a)	38.(d)	39.(b)	40.(d)
41.(a)	42.(d)	43.(c)	44.(b)
45.(d)	46.(c)	47.(c)	48.(a)
49.(b)	50.(d)		

Solution:-

Sol.1.(a) Production in year 2015 = 12.6
Production in Year 2016 = 18.9
Percentage increase
$= \frac{18.9 - 12.6}{12.6} \times 100 = 50\%$

Sol.2.(a) Direct labour cost of 500 product = ₹1,00,000
Direct labour cost 1 product = ₹200
24 % of manufacturing cost = 200
Then, 100% of manufacturing cost
$= ₹\frac{20000}{24}$
Now, S.P $= \frac{144}{100} \times \frac{20000}{24} = ₹1200$

Sol.3.(d) Total marks of Test 1 , Test 2 and Test 3 = 80 + 80 + 100 = 260
Marks obtained by A = 45 + 50 + 75 = 170
Percent marks of A = $\frac{170}{260} \times 100$
Marks obtained by C = 40 + 45 + 65 = 150
Percent marks of C = $\frac{150}{260} \times 100$
More marks percent obtained by A than C = $\frac{170-150}{260} \times 100 = \frac{20}{260} \times 100 = 7.69$

Sol.4.(d) Decreased % for company
A = $\frac{5-4}{5} \times 100 = 20\%$

Sol.5.(a) Ratio of girls who have passed in Physics, Chemistry and Biology = 135 : 195 : 165 = 9 : 13 : 11

Sol.6.(b) Required ratio

$= \frac{80+30+50+90}{60+40+70+60} = \frac{250}{230} = 25:23$

Sol.7.(b) Average production of X in 4 years = $\frac{50+45+55+50}{4} = 50$

Average production of Y in 4 years

$= \frac{35+45+45+55}{4} = \frac{180}{4} = 45$

Average production of Z in 4 years

$= \frac{45+40+40+60}{4} = \frac{185}{4} = 46.25$

Branch Y has minimum average production,

Sol.8.(b)

Number of fans sold more than ovens

$= \frac{28-8}{100} \times 16800 = \frac{16800}{5} = 3360$

Sol.9.(b)

Cost of 100 power banks = ₹ 50,000

Cost of 1 power bank = ₹ 500

Let the overall manufacturing cost on 1 power bank be ₹x

$\frac{30x}{100} = 500 \Rightarrow x = \frac{50000}{30}$

Selling price of the power bank

$= \frac{150}{100} \times \frac{50000}{30} = ₹2500$

Sol.10.(d) Percentage increase in the number of erasers sold from 2018 to 2020 = $\frac{55-35}{35} \times 100 = 57\%$

Sol.11.(d) Average

$= \frac{2.6+1.2+5.5+4.2+6.3+5.4}{6} = \frac{25.2}{6} = 4.2$

Hence, In year 2014 and 2015 sales was less than the average sale

Sol.12.(a) Average annual profit percentage in all the years

$= \frac{40+55+45+65+70+60}{6}$

$= \frac{335}{6} = 55.83$

which is closest to the annual profit of 2008.

Sol.13.(c) Number of candidates trained in Batch 2 in 2001 = 144

number of candidates trained in Batch 5 in 2005 = 90 , Required percentage

$= \frac{144-90}{90} \times 100 = 60\%$

Sol.14.(d) Expense on salary

= 5117 + 4752 = 9869

Expense on infrastructure

= 7310 + 5598 = 12908

Required percentage

$= \frac{9869}{12908} \times 100 = 76.45\% \approx 76\%$

Sol.15.(a) Total expenditure in 2017

= 361 + 93 + 83 + 142 + 52 = 731

Total expenditure in 2021

= 652 + 111+ 132 + 101 + 75 = 1071

As per question,

x % of 1071 = 731

$x = \frac{731}{1071} \times 100 = 68.25\%$ or 68%

Sol.16.(c) Number of cases in C and F

= 12 + 30 = 42%

As per question,

14% = 672 ⇒ 42% = 2016

Required number of cases = 2016

Sol.17.(b) The number of employees who walked to work = 55

Number of employees who travelled by bus = 35, Required percentage

$= \frac{55-35}{35} \times 100 = 57.14$ or 57%

Sol.18.(b) Total directors

= 81 + 54 + 51 + 57 + 27 = 270

Number of directors in continent of America = 54

Required ratio = 54 : 270 = 1 : 5

Sol.19.(d) Pages dedicated to sports and editorial coverage = 28 + 7 = 35%

Total number of pages = 35% of 60 = 21

Sol.20.(b) Mean weight =

$\frac{5\times31+7\times25+6\times20+4\times35+3\times20}{5+7+6+4+3}$

= 26

Sol.21.(d) Total number of Literate people in A = $1500 \times \frac{2}{5} = 600$

Total number of Literate people in B

$= 4000 \times \frac{11}{20} = 2200$

Total number of Literate people in C

$= 3000 \times \frac{13}{15} = 2600$

Total number of Literate people in D

$= 5500 \times \frac{4}{5} = 4400$

So, The required %

$= \frac{600+2200+2600+4400}{1500+4000+3000+5500} \times 100\%$

$= \frac{9800}{14000} \times 100\% = 70\%$

Sol.22.(c) Number of cosmetics imported in 2016 and 2020

= 35 + 25 = 60

Number of toys imported in 2018 and 2020 = 25 + 20 = 45

Ratio = 60 : 45 = 4 : 3

Sol.23.(c)

Profit in Product V = 78 - 65 = 13

Profit in Product W = 85.5 - 75 = 10.5

Profit in Product X = 69 - 60 = 9

Profit in Product Y = 92 - 80 = 12

Profit in Product Z = 77 - 70 = 7

Product V has maximum profit = 13

Sol.24.(b) In 2017, percentage growth

$= \frac{85-75}{75} \times 100 = 13.33\%$

In 2018, percentage growth

$= \frac{125-85}{85} \times 100 = 47.05\%$

In 2019, percentage growth

$= \frac{145-125}{125} \times 100 = 16\%$

In 2020, percentage growth

$= \frac{190-145}{145} \times 100 = 31.03\%$

In 2018, growth rate was maximum.

Sol.25.(b) Total call conversation (minutes)

= 4 × 1 + 14 × 2 + 40 × 3 + 30 × 4 + 12 × 5

= 4 + 28 + 120 + 120 + 60 = 332

Sol.26.(d) Total enrolled students

= 45 + 52 + 48 + 40 + 55 = 240

Total qualified students

= 38 + 40 + 42 + 32 + 48 = 200

Now, Ratio = $\frac{240}{200}$ = 6 : 5

Sol.27.(a) Total sum of the ages of the students = 64 + 48 + 70 + 63 + 35 = 280

Total number of students

= 8 + 6 + 10 + 9 + 7 = 40

Average = $\frac{280}{40} = 7$

Sol.28.(b) Expenditure spent on food and advertisement = $\frac{40}{100} \times 63070$

$= ₹25228 \simeq$ ₹25,000

Sol.29.(a) 10% students scored A grade = 36 students.

20% students scored B grade

= 72 students.

The total number of students who scored Grade A and Grade B is = (36 + 72) = 108 students.

Sol.30.(d) The average of AQI in Kolkata

$= \frac{306+288+274+172}{4} = 260$

and the average of AQI in Delhi

$= \frac{248+246+246+236}{4} = 244$

So, the difference in the average of AQI in Kolkata and Delhi in the month of February is 16.

Sol.31.(a) Total number of web series from (2014 - 2018)

= 30 + 35 + 35 + 42 + 48 = 190

Total web series with IMDB rating < 5

= 6 + 9 + 11 + 12 + 12 = 50

So, percentage of web series with a rating 5 star and above

$= \frac{(190-50)}{190} \times 100 = \frac{1400}{19}$
= 73.68 % = 74 %

Sol.32.(b) The total number of cars sold in the first three years
= (150 + 100 + 250) = 500
and in the last three years
= (100 + 300 + 300) = 700
So, the difference between the total number of cars sold in the first three years and in the last three years
= 700 - 500 = 200.

Sol.33.(c) If a person had deposited Rs. 23 lakhs at the beginning of the year in bank A and B, and the interest rates in the third year for bank A and B are 8.5% and 10% respectively.
Then, the difference in interest amount earned in year 3 between bank A and B
$\Rightarrow \frac{2300000}{100} \times (10 - 8.5)$
= 2300 × 15 = 34,500 Rs.

Sol.34.(a) Pass percentage of school B = 32
Ratio of boys and girls = 3 : 5
Pass % of boys = $32 \times \frac{3}{8}$ =12
Pass % of school C = 24
Ratio of boys to girls = 1 : 2
Pass % of boys = $24 \times \frac{1}{3}$ = 8
Required ratio = 12 : 8 = 3 : 2

Sol.35.(a) Difference in the number of male and female,
For company A, 250 - 150 =100
B, 350 - 250 = 100
C, 200 - 150 = 50
D, 350 - 100 = 250
Therefore , company D has maximum difference.

Sol.36.(b) Total number of students admitted in all the faculties
= 1200 + 300 + 450 + 650 + 1000 = 3600
Now, number of students admitted to Arts faculty = 1200
So, the part of the total students admitted in the Arts faculty is = $\frac{1200}{3600} = \frac{1}{3}$

Sol.37.(a) From the given table D contributes only 38 lakh tonnes which is least.

Sol.38.(d) 360° = 100% ⇒1% = $(\frac{360}{100})°$
social services sector
(16.1%) → $\frac{360}{100}$ × 16.1 = (57.96)° ≈ 58°

Sol.39.(b)
Saving (60°) = 8000 Rs. ⇒ 1° = $\frac{8000}{60}$
Total expenditure (105° + 120° + 45° + 30°)
= 300° → $\frac{8000}{60}$ × 300 = 40,000 Rs.

Sol.40.(d) Total expenditure (100%)
= 360° → 1% = $\frac{360°}{100}$
Difference between printing and binding expenditure → (25 − 10)% = 15%
So , 15% = $\frac{360°}{100}$ × 15 ⇒ 54°

Sol.41.(a)
Percentage difference in 2001 − 2002 → (48 − 34) = 14
Percentage difference in 2002 − 2003 → (59 − 48) = 11
Percentage difference in 2003 − 2004 → (60 − 59) = 1
Percentage difference in 2004 − 2005 → (60 − 40) = 20
Clearly , there is lesser percentage change in 2003 − 2004 .

Sol.42.(d)
Amount spend on food (F) and household expenses (H) together is :-
13% + 17% = 30% of total expenses
Given that , 100% = 85000
Then 30% = 25500

Sol.43.(c)
Amount spend on Rent (R) and household expenses (H) together is :-
14% + 17% = 31%
Amount spend on education fees (E) :- 19%
To make expense on education equal to expenses on rent and household together = 31% - 19% = 12%
Given that , 100% = 85000
The value of 12% = 10200

Sol.44.(b) Average sell in 2010 by all company (in Thousands)
= $\frac{58+72+66+76+48}{5}$ = 64

Sol.45.(d) Sale by company C1 , C3 and C5 in both year =
{(58 + 68) + (66 + 72) + (48 + 73)}= 385

Sol.46.(c) Ratio of total sell in both years by company C2 : Ratio of total sell in both years by company C4
75 + 85 : 45 + 95 ⇒ 160 : 140 ⇒ 8 : 7

Sol.47.(c) total sales in two years by company C2 : total sales in two years by company C4
⇒ 87 + 80 : 51 + 87 ⇒ 167 : 138

Sol.48.(a)
Total number of vehicle other than bikes registered in jan 2017
= 27,000 - 21,000 = 6,000
Total number of vehicle other than bikes registered in April 2017
= 35,000 - 20,000 = 15,000
Required increasement in the registration of vehicles other than bikes
= 15,000 - 6,000 = 9,000

Sol.49.(b) Total salary during the period of 2001- 2006
= 1,500 + 2,600 + 3,200 + 4,100 + 5,000 + 5,200 = 21600
Total expenditure during the period of 2001- 2006
= 800 + 1100 + 1000 + 1025 + 1150 + 1025 = ₹6100
Required ratio = 21600 :6100 = 216 : 61

Sol.50.(d)

Subjects → Students↓	P	C	B	M
W	70	90	50	85
X	55	80	95	60
Y	60	20	90	40
Z	90	80	40	65

Total full marks of all 4 subject
= 100 + 100 + 100 + 100 = 400
Percentage of W in all four subject
= $\frac{70+90+50+85}{400} \times 100 = 73.75\%$
Percentage of Y in all four subject
= $\frac{55+80+95+60}{400} \times 100 = 72.5\%$
Percentage of Z in all four subject
= $\frac{90+80+40+65}{400} \times 100 = 68.75\%$
So, W got the highest percentage of marks in P, C, M and B.

Mean, Median & Mode

Key -points :

1. Mean :

The mean is the sum of the values, divided by the total number of values. The symbol $\overline{X}$ represents the sample mean.

Mean for raw or ungrouped data :

$\overline{X} = \frac{X_1 + X_2 + X_3 + ...X_n}{n} = \frac{\Sigma X}{n}$

where n represents the total no of values in the sample.

Mean for discrete frequency distribution :

$\overline{X} = \frac{Sum\ of\ all\ observations}{Total\ number\ of\ observations} = \frac{\Sigma fixi}{\Sigma fi}$

Short cut - method :

$\overline{X}$ = A + $\frac{\Sigma fidi}{n}$ × c

where, A = assumed mean,

$\Sigma fidi = f_1d_1 + f_2d_2 + ... + f_kd_k$

n = total number of observations

$di = \frac{x_i - A}{c}$ and c = common factor of deviation

Mean for continuous frequency distribution :

$\overline{X}$ = A + $\frac{\Sigma fidi}{n}$ × c

where c = class length

• **Weighted Mean :** Weighted mean of a variable x by multiplying each value by its corresponding weight and dividing the sum of the products by the sum of the weights.

$\overline{X} = \frac{w_1x_1 + w_1x_1 + ...w_nx_n}{w_1 + w_2 + ...w_n} = \frac{\Sigma wx}{\Sigma w}$

• **Combined mean :** If we know the means of two or more groups of observations, we can find mean of the combined group. Such a value is called Combined mean. It is denoted by $\overline{X_c}$.

Suppose $\overline{X_1}$, $\overline{X_2}$, ..., $\overline{X_k}$ are means of k groups having n_1, n_2,....., n_k observations respectively. The formula for combined mean is as follows :

$\overline{X_c} = \frac{n_1\overline{X_1} + n_2\overline{X_2} + ... + n_k\overline{X_k}}{n_1 + n_2 + ... + n_k}$

2. Median :

Median is defined as the value of middlemost observations when the data are arranged in either ascending or descending order. It is denoted by M. In other words, 50% of values of observations in the data are above median and 50% observations have value less than the median.

Median for raw data :

For n observations x_1, x_2, x_3, ..., x_n median is found as follows :

M = value of the $(\frac{n+1}{2})^{th}$ observation

where, n = total number of observations

For example, if we have 15 observations, the value of the $(\frac{15+1}{2})^{th}$ that is 8th observation will be exactly the central value, which is called median.

Median for discrete frequency distribution :

Suppose x_1, x_2, x_3, ..., x_k are the values of a variable with frequencies f_1, f_2, f_3, ..., f_k respectively.

A frequency distribution generally shows the observations arranged in ascending order. We shall use cumulative frequencies to find the median for a frequency distribution where observations are arranged in ascending order.

Median M = value of the $(\frac{n+1}{2})^{th}$ observation

where, n = total number of observations

Median for continuous frequency distribution :

A continuous frequency gives the values of the variable in the form of class intervals and they are generally arranged in ascending order. In such cases, we will use the cumulative frequencies to find the median. These cumulative frequencies will show us the class containing the median. For this, we take Median class = class containing the $(\frac{n}{2})^{th}$ observations

where, n = total number of observations

Median M = L + $\frac{\frac{n}{2} - cf}{f}$ ×c

where, L = lower boundary point of median class

cf = cumulative frequency of the class prior to median class

f = frequency of the median class

c = length of median class

Note : When no prior class is there, then in that case cf = 0

3. Mode :

The value which gets repeated the maximum number of times or the value occurring with maximum frequency in the given data is called mode. It is denoted by M_0. Example : The mode of the given data : 4, 4, 9, 9, 9, 5, 5, 5, 5, 5 is 5, as 5 is repeated the maximum number of times.

Mode for raw data and for discrete frequency distribution :

In these cases the mode can be found simply by inspection. We can find the mode as a value among the observations which is repeated maximum number of times or the one which has maximum frequency.

Mode for continuous frequency distribution :

The class having the maximum frequency is called as modal class of the frequency distribution.

Mode M_0 = L+ $\frac{f_m - f_1}{2f_m - f_1 - f_2}$× c

where, L = lower boundary point of the modal class

f_m = frequency of the modal class

f_1 = frequency of the class prior to modal class

f_2 = frequency of the class succeeding to modal class

c = class length of the modal class

Note : The above formula can be used only if the distribution has classes of equal class length. Moreover, the formula can be used only in those cases where the maximum frequency is only for one class.

Empirical formula for mode :

The noted statistician Karl Pearson established a relation between mean, median and mode by studying their values for different data sets. He observed that for data that are not evenly distributed around average, the difference between mean and mode is approximately 3 times the difference between mean and median.

That is,

(Mean − Mode) = 3 (Mean − Median)

The following formula is obtained to find the mode using this relation :

Mode = 3 (Median) − 2 (Mean)

This written in notations as :

$M_0 = 3M - 2\overline{X}$

This formula for mode is used in the following situations : More than one observation in a frequency distribution appears with the highest frequency.

The continuous distribution has classes of unequal length.

The frequency distribution is a mixed distribution that is a part of it is discrete and the rest is continuous.

4. Range :
The range is the difference between two extreme observations of the distributions. For eg. if A and B are the greatest and smallest values respectively of observations in a distribution, then its range is A – B.
Range = Highest observation – Lowest observation

5. Variance : Variance is a measure of how data points differ from the mean. According to Layman, a variance is a measure of how far a set of data (numbers) are spread out from their mean (average) value.
the variance is the square of standard deviation, i.e.,

Variance = (Standard deviation)^2= σ^2

The corresponding formulas are :-

standard deviation $\sigma = \sqrt{\frac{\sum(X-\mu)}{N}}$

Where X (or x) = Value of Observations
μ = mean of all Values
N = Total number of values in the observation

6. Coefficient of variance : The coefficient of variation (CV) is defined as the ratio of the standard deviation to the mean.

$C_v = \frac{\sigma}{\mu} \times 100$

Where σ = standard deviation
and μ = mean

Variety Questions

Q.1. The mean of 36 numbers was found to be 42. Later, it was discovered that a number 47 was misread as 41. Find the correct mean of the given numbers (rounded off to two decimal places).
Group D 17/08/2022 (Afternoon)
(a) 43.62 (b) 42.17 (c) 43.74 (d) 42.83

Q.2. Find the median of the data 11, 16, 33, 15, 51, 18, 71, 75, 22, 17.
Group D 17/08/2022 (Afternoon)
(a) 18 (b) 24 (c) 20 (d) 22

Q.3. A group of class IX students conducted a survey for the number of family members in a household on 40 households in a locality, which resulted in the given frequency table. What is the mode of the data?

Family Size	Number of families
2-4	10
4-6	8
6-8	12
8-10	6
10-12	4

Group D 18/08/2022 (Morning)
(a) 6.6 (b) 6.7 (c) 6.9 (d) 6.8

Q.4. Find the mode of the data 2, 2, 3, 5, 15, 15, 15, 20, 21, 23, 25, 15, 23, 25.
Group D 18/08/2022 (Afternoon)
(a) 21 (b) 25 (c) 23 (d) 15

Q.5. Find the median class of:

Cl	F
0 - 50	12
50 - 100	15
100 - 150	13
150 - 200	10

Group D 18/08/2022 (Evening)
(a) 50 - 100 (b) 150 - 200
(c) 0 - 50 (d) 100 - 150

Q.6. If the mean of a data is 65 and its mode is 23 then the median using empirical formula is:
Group D 25/08/2022 (Morning)
(a) 53 (b) 54 (c) 51 (d) 52

Q.7. Which is the correct formula for median of grouped data?
Consider:
L = lower limit of median class
CF_0 = cumulative frequency of preceding class
F= frequency of median class
H = class width
N = the total of frequency
Group D 01/09/2022 (Evening)
(a) $\frac{\frac{N}{2} - CF_0}{F} \times H$
(b) L + $\frac{\frac{N}{2} - CF_0}{F} \times H$
(c) L + $\frac{\frac{N}{2} - CF_0}{F}$
(d) L + $\frac{N}{2}$ - CF_0 - F × H

Q.8. If the median and the mode of a set of data are 12 and 15 respectively, then find the value of thrice of the mean of the same data set.
Group D 26/09/2022 (Evening)
(a) $\frac{63}{2}$ (b) $\frac{33}{2}$ (c) $\frac{35}{2}$ (d) $\frac{23}{2}$

Q.9. Study the following data and find their mode, median and mean in the order mentioned .
8, 9, 8, 5, 9, 8, 9, 7, 9
Group D 07/10/2022 (Evening)
(a) 8, 9, 9 (b) 8, 9, 8
(c) 9, 9, 9 (d) 9, 8, 8

Q.10. If K is the mean of 2, 3, 4, k then the mode is:
Group D 11/10/2022 (Evening)
(a) 4 (b) 2 (c) 3 (d) 1

Q.11 What is the difference in the mode and the mean of the observation?
4. 5, 6, 7, 8, 12, 9, 12, 5, 12
NTPC CBT II Level 6 (09/05/2022) Shift 1
(a) 4 (b) 4.2 (c) 5.1 (d) 4.6

Q.12. What will be the mean of all the prime numbers between 10 and 22 ?
NTPC CBT II Level 4 (10/05/2022) Shift 1
(a) 13 (b) 15 (c) 16 (d) 14

Q.13. If an observation 70 is removed from the data 60, 68, 70,72,74,76,78,80 then the median is increased by :
NTPC CBT II Level 2 (13/06/2022) Shift 2
(a) 0.5 (b) 1 (c) 1.5 (d) 2

Q.14. The maximum weight lifted by 750 participants are recorded and it is found that the mean and the median of this distribution are both more than the mode. If the mean and the median are 184 kg and 178 kg respectively, then which of the following is the most likely value of the mode (in Kg).
NTPC CBT II Level 2 (13/06/2022) Shift 2
(a) 168 (b) 172 (c) 162 (d) 166

Q.15. If mean is 40 and standard deviation is 5 then C.V (Coefficient of variation) is.
NTPC CBT - I 30/12/2020 (Morning)
(a) 5.5% (b) 20.5% (c) 100% (d) 12.5%

Q.16. Find the variance of the following data points:
6, 7, 5, 9, 12,15
NTPC CBT - I 03/02/2021 (Evening)
(a) $\frac{37}{6}$ (b) $\frac{67}{6}$ (c) $\frac{81}{3}$ (d) $\frac{37}{3}$

Q.17. Which of the following CANNOT take a negative value?
NTPC CBT - I 10/02/2021 (Morning)
(a) Standard Deviation (b) Median
(c) Mean (d) Skewness

Q.18. The variance of 20 observations is 5. If each observation is multiplied by 2, then the variance of the resulting observation will be:
NTPC CBT - I 10/02/2021 (Evening)
(a) 5 (b) 2 × 5 (c) $2^2 \times 5$ (d) 2×5^2

Q.19. If the variance of 5 values is 0.64, then what will be its standard deviation?
NTPC CBT - I 31/07/2021 (Evening)
(a) 5.64 (b) 0.128 (c) 3.2 (d) 0.8

Q.20. Find the mean of the first 10 consecutive odd numbers.
RRB JE 02/06/2019 (Afternoon)

(a) 15 (b) 11 (c) 10 (d) 13

Q.21. What is the mean of the first five Triangular Numbers?
RRB ALP Tier - I 10/08/2018 (Morning)
(a) 7 (b) 6 (c) 8 (d) 5

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.22. For a grouped data, if X_i is the class mark and f_i is the corresponding frequency, then by direct method, mean x is given by:
Group D 22/08/2022 (Afternoon)
(a) $\frac{\Sigma x_i}{\Sigma f_i}$ (b) $\frac{\Sigma f_i x_i}{\Sigma f_i}$
(c) $\frac{\Sigma f_i x_i}{\Sigma x_i}$ (d) $\Sigma f_i x_i$

Q.23. Find the arithmetic mean of 5, 15, 23, 26 and 29.
Group D 23/08/2022 (Evening)
(a) 20.6 (b) 18.6 (c) 19.6 (d) 17.6

Q.24. Which of the following is the correct empirical formula?
Group D 24/08/2022 (Morning)
(a) $\frac{Mode - Mean}{3}$ = Median - Mean
(b) $\frac{Mode - Mean}{3x2}$ = Median - Mean
(c) 3 (mode-mean) = median - mean
(d) $\frac{2}{3}$ (Mode - Mean) = Median - Mean

Q.25. Find the median of:

Cl	F
0 - 10	2
10 - 20	4
20 - 30	7
30 - 40	9
40 - 50	10
50 - 60	12
60 -70	6

Group D 24/08/2022 (Morning)
(a) 40 (b) 43 (c) 42 (d) 41

Q.26. If the mean of the data 11, 17, x + 1, 3x, 19, 2x - 4, x + 5 is 21, then find the mode of the data.
Group D 24/08/2022 (Afternoon)
(a) 17 (b) 15 (c) 11 (d) 19

Q.27. If the mean of the following data is 4, find the missing frequency.

x	3	5	9	2
f	3	4	_	8

Group D 24/08/2022 (Evening)
(a) 5 (b) 4 (c) 7 (d) 3

Q.28. The frequency distribution here gives the monthly consumption of electricity of 60 consumers of a locality. What is the median of the data?

Monthly consumption (in units)	Number of consumers
50 - 60	6
60 - 70	8
70 - 80	15
80 - 90	20
90 - 100	11

Group D 25/08/2022 (Morning)
(a) 80.5 (b) 83.1 (c) 82.4 (d) 81.2

Q.29. Find the double of the lower limit of the modal class in the given data.

Cl	100-110	110-120	120-130	130-140	140-150
F	12	15	32	34	22

Group D 25/08/2022 (Afternoon)
(a) 540 (b) 280 (c) 260 (d) 68

Q.30. Find the mean of the following data.

x	3	2	10	4	5
f	5	3	4	2	6

Group D 25/08/2022 (Evening)
(a) 8.65 (b) 3.68 (c) 4.95 (d) 6.52

Q.31. For the following data, find the weighted mean.

X_i	4	3	5	7	2	1
W_i	1	0	2	1	3	5

Group D 25/08/2022 (Evening)
(a) 2.66 (b) 7.5 (c) 5.6 (d) 8

Q.32. Find the mode of the given frequency distribution.

x	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
f	5	8	10	2	5

Group D 26/08/2022 (Morning)
(a) 20 (b) 26 (c) 22 (d) 24

Q.33. For some given data, if the mean and mode are 42 and 60 respectively, find the median of that data using the empirical relation.
Group D 26/08/2022 (Evening)
(a) 50 (b) 44 (c) 46 (d) 48

Q.34. If the mean of 22.5, 56, 42.5, 2x + 1, x - 2, 3x , 36 is 30 for x > 0, then find the value of x.
Group D 26/08/2022 (Evening)
(a) 6 (b) 7 (c) 4 (d) 9

Q.35. Find the median of the given frequency distribution.

Class Internal	0-10	10-20	20-30	30-40	40-50
f	10	8	7	9	12

Group D 29/08/2022 (Morning)
(a) $\frac{250}{7}$ (b) $\frac{190}{7}$ (c) $\frac{290}{7}$ (d) $\frac{150}{7}$

Q.36. The median of 9, 11, 15, 17, x, 19, 21 is x, where x is an integer. Which of the following can be the value of x?
Group D 29/08/2022 (Afternoon)
(a) 14 (b) 18 (c) 16 (d) 13

Q.37. The table here gives the yield of wheat per hectare of 100 farmers of a village. What is the cumulative frequency of the class preceding the median class?

Production Yield (Qui/Hec)	Number of farmers
30 - 40	5
40 - 50	18
50 - 60	15
60 - 70	22
70 - 80	27
80 - 90	13

Group D 30/08/2022 (Morning)
(a) 43 (b) 38 (c) 29 (d) 35

Q.38. There are two sets of data A and B. The mean of both sets is same. The median of data B is twice the median of data A. The relation between the modes of sets A and B is
Group D 01/09/2022 (Morning)
(a) $Mode_B - Mode_A = \left(\frac{3}{2}\right) Median_A$
(b) $Mode_B - Mode_A = 3\ Median_A$
(c) $Mode_B - Mode_A = \left(\frac{3}{4}\right) Median_A$
(d) $Mode_B + Mode_A = 3\ Median_A$

Q.39. The monthly wages of 6 employees in a company are ₹ 5,000, ₹ 6,000, ₹ 8,000, ₹ 8,500, ₹ 9,300, and ₹ 9,500. Find the median of their wages.
Group D 01/09/2022 (Afternoon)
(a) ₹ 8,000 (b) ₹ 8,250
(c) ₹ 8,500 (d) ₹ 8,750

Q.40. What is the value of (2x+3y), if the mean of the following distribution is 54?

Class	Frequency
0 - 20	7
20 - 40	11
40 - 60	x
60 - 80	9
80 - 100	y
Total	50

Group D 02/09/2022 (Morning)
(a) 69 (b) 59 (c) 56 (d) 57

Q.41. The mean and the mode of a set of data are 58.7 and 61.1, respectively. Find the median of the data, using the empirical formula.
Group D 02/09/2022 (Morning)
(a) 54.6 (b) 55.2 (c) 55.8 (d) 59.5

Q.42. For a data, if the mean is 28.5 and the median is 32, then the mode using empirical formula is:
Group D 02/09/2022 (Afternoon)
(a) 40 (b) 42 (c) 39 (d) 41

Q.43. If the median of a data is 24.12 less than its mode, then the median of the data exceeds its mean by _____. (Use the empirical formula to find the answer)
Group D 05/09/2022 (Afternoon)
(a) 16.08 (b) 12.06 (c) 6.03 (d) 8.04

Q.44. The heights of six students in a school are 160 cm, 175 cm, 142 cm, 136 cm, 148 cm, and 182 cm. Find the mean of their heights (in cm) (Rounded off to 2 decimal places).
Group D 05/09/2022 (Afternoon)
(a) 152.55 (b) 160.47
(c) 147.57 (d) 157.17

Q.45. What is the median of following distribution?

Class	100-150	150-200	200-250	250-300	300-350
Frequency	22	18	25	15	20

Group D 05/09/2022 (Evening)
(a) 240 (b) 220 (c) 225 (d) 210

Q.46. For certain data, the mode is 24.6 and mean is 20.1. What is the median of that data?
Group D 06/09/2022 (Afternoon)
(a) 23.5 (b) 24.1 (c) 21.6 (d) 22.2

Q.47. Find the mode of the following data.
66, 69, 83, 69, 84, 74, 71, 83, 69, 84, 73, 83, 69, 71, 84, 74, 83, 66, 74, 71, 83, 66, 90, 90
Group D 06/09/2022 (Evening)
(a) 74 (b) 90 (c) 84 (d) 83

Q.48. If the mean of the following data is 18, then the value of x is:

Xi	10	15	20	25
fi	5	x	7	8

Group D 08/09/2022 (Afternoon)
(a) 13 (b) 10 (c) 9(d) 11

Q.49. What is the mean of the following distribution?

Marks	Number of Students
10	17
30	28
50	32
70	24
90	19

Group D 09/09/2022 (Afternoon)
(a) 51 (b) 49.2 (c) 50 (d) 52.4

Q.50. The arithmetic mean of the observations 39, 49, 59, 60, 70, 80, 90, 93 and 90 is:
Group D 12/09/2022 (Afternoon)
(a) 78 (b) 79 (c) 70 (d) 76

Q.51. The median of the observations 20, 23, 25, 30, 20, 31, 32, 35, 20, 41, 42, 43, 20, 20 and 20 is:
Group D 12/09/2022 (Evening)
(a) 23 (b) 25 (c) 26 (d) 28

Q.52. The arithmetic mean of the observations 3, 6, 8, 10, 12, 14, 18, 24 and 31 is:
Group D 13/09/2022 (Afternoon)
(a) 15 (b) 17 (c) 16 (d) 14

Q.53. 100 surnames were randomly picked up from a local telephone directory and the frequency distribution of the number of letters from the English alphabets in the surnames was obtained as follows.

Number of Letters	Number of Surnames
1 - 4	6
4 - 7	30
7 - 10	40
10 - 13	16
13 - 16	4
16 - 19	4

The median number of letters in the surnames is:
Group D 13/09/2022 (Evening)
(a) 8.05 (b) 7.09 (c) 8.02 (d) 7.04

Q.54. What is the mode of the data given below? [Give your answer correct to 2 decimal places]

Age in years	NO. of patients
15 - 52	12
25 - 35	18
35 - 45	20
45 - 55	25
55 - 65	30
65 - 75	20
75 - 85	15

Group D 14/09/2022 (Morning)
(a) 58.33 (b) 63.33 (c) 57.33 (d) 55.33

Q.55. The marks scored by 10 students are given below.
17, 13, 18, 11, 15, 13, 19, 18, 13, 17
The mode of the data is:
Group D 14/09/2022 (Evening)
(a) 13 (b) 17 (c) 11 (d) 19

Q.56. If the mode of a distribution is 27 and its median is 35, then the mean of the distribution is _____(using empirical relation).
Group D 15/09/2022 (Evening)
(a) 39 (b) 62 (c) 37.5 (d) 43.5

Q.57. The mode of 5, 18, 6, 7, 6, 2, 3, 4, 24, 2, 7, 21, 2, 81 is:
Group D 17/09/2022 (Morning)
(a) 6 (b) 2 (c) 81 (d) 7

Q.58. The mean marks of the following distribution is

Marks obtained	No. of students
25	5
30	6
35	3
40	1

Group D 17/09/2022 (Evening)
(a) 32 (b) 31 (c) 29 (d) 30

Q.59. The median of the observations below, given in ascending order, is n-1.
4, 8, n - 14, 17, n + 5, 30, 32 and 35
What is the value of n?
Group D 19/09/2022 (Morning)
(a) 18 (b) 19 (c) 24 (d) 17

Q.60. Which of the following expressions is correct?
1. Mode - median = 2 (median - mean)
2. $Median = \frac{mode + median}{2}$
3. Mode = 2 median - mean
4. $Mean = \frac{2\,Median - mode}{2}$
Group D 19/09/2022 (Morning)
(a) 2 (b) 4 (c) 3 (d) 1

Q.61. The following observations are arranged in ascending order.
29, 32, 48, 50, x, x+2, 72, 78, 84, 95
If the median is 63, then the value of x is:
Group D 19/09/2022 (Afternoon)
(a) 50 (b) 31 (c) 62 (d) 63

Q.62. First find the median of 46, 64, 87, 41, 58, 77, 35, 90, 55, 92, and 33. If 92 is replaced with 99 and 41 is replaced with 43 in the data, then find the new median. What is the difference between the old median and the new median?
Group D 20/09/2022 (Morning)
(a) 2 (b) 3 (c) 0 (d) 6

Q.63. Find the median age, given the ages of 10 persons (in years) are as follows:
22, 23.5, 26, 22.5, 24, 26, 23, 24.5, 25, 21
Group D 20/09/2022 (Afternoon)
(a) 22.00 (b) 23.75 (c) 25.00 (d) 22.25

Q.64. The weights (in kg) of 10 students of a class have been recorded as 35, 42, 56, 44, 55, 44, 36, 44, 49 and 35. Find the modal weight.
Group D 20/09/2022 (Evening)
(a) 35.5 kg (b) 44.0 kg
(c) 35.0 kg (d) 36.0 kg

Q.65. What is the sum of the deviations of the values of the data set 5, 6, 7, 9, 10, 12 and 14, from the mean of the values given in the same data set?
Group D 20/09/2022 (Evening)
(a) 1 (b) -1 (c) 2 (d) 0

Q.66 The weights (in kg) of 10 students of a class are recorded as 35, 42, 56, 44, 55, 44, 38, 44, 49 and 35. Find the modal weight.
Group D 20/09/2022 (Evening)

(a) 36.0 kg (b) 35.5 kg
(c) 44.0 kg (d) 35.0 kg

Q.67. Find the mean length of a leaf, given the lengths of 10 leaves (in mm) are as follows:
146, 150, 147, 143, 158, 139, 154, 149, 151, 155
Group D 22/09/2022 (Afternoon)
(a) 148.2 mm (b) 151.9 mm
(c) 139.6 mm (d) 149.2 mm

Q.68. Find the median of the following distribution.

x	1	2	3	4	5
f	1	7	4	8	2

Group D 22/09/2022 (Evening)
(a) 3 (b) 4 (c) 13 (d) 14

Q.69. The data below gives the number of wickets taken by a bowler in 10 different matches. Find the mode of the data. 3, 4, 6, 3, 1, 3, 5, 4, 2.2.
Group D 26/09/2022 (Afternoon)
(a) 4 (b) 6 (c) 3 (d) 2

Q.70. The sum of three consecutive numbers is 177. The mean of these three numbers is:
Group D 26/09/2022 (Afternoon)
(a) 59 (b) 60 (c) 57 (d) 58

Q.71. Find the median of the given frequency distribution.

Class interval	class f
0-10	8
10-20	7
20-30	9
30-40	12
40-50	11

Group D 26/09/2022 (Evening)
(a) $\frac{215}{9}$ (b) $\frac{85}{3}$ (c) $\frac{265}{9}$ (d) $\frac{88}{3}$

Q.72. The nominal marks obtained by students who appeared in a test are given below. Find the median marks of the students.

Marks	11	20	8	16	29	22
No. of students	14	5	11	9	3	8

Group D 27/09/2022 (Afternoon)
(a) 13 (b) 8 (c) 13.5 (d) 10.5

Q.73. Find the arithmetic mean of the following data.

x	5	10	15	20	25	30
f	3	5	6	2	1	3

Group D 27/09/2022 (Evening)
(a) 15.5 (b) 13.5 (c) 12.5 (d) 14.5

Q.74. The following are the marks obtained in a test out of 20 by a group of 10 students. Find the mode of the data.
15, 12, 13, 14, 16, 15, 18, 19, 11, 15
Group D 28/09/2022 (Afternoon)
(a) 18 (b) 15 (c) 16 (d) 19

Q.75. Find the arithmetic mean of the following data.
12, 13, 18, 12, 15, 15, 16, 13, 19, 17
Group D 28/09/2022 (Afternoon)
(a) 15.5 (b) 14 (c) 13.5 (d) 15

Q.76. Find the mode of the given frequency distribution

Marks	Frequency
51	3
29	4
85	6
40	7

Group D 30/09/2022 (Evening)
(a) 51 (b) 7 (c) 85 (d) 40

Q.77. The median of the data 9, 12, 11, 8, 16, 18, 10, 14, 15, 13, 17, 20, 2, 24 is x. If 2 and 8 are replaced by 21 and 18 in this data, respectively, then the median of the data so obtained is y.
What is the value of (3x−y)?
Group D 06/10/2022 (Afternoon)
(a) 23.5 (b) 25 (c) 24.5 (d) 26

Q.78. If the mean and the mode of a data set are 5 and 8, respectively, then, using the relevant empirical relation, find the median of the same data set.
Group D 07/10/2022 (Morning)
(a) 6 (b) 7 (c) 14 (d) 3.5

Q.79. The median of the following data is 28.5. The total frequency is 60. The values of x and y, respectively, are:

Age in years	No. of patient
0 - 10	5
10 - 20	x
20 - 30	20
30 - 40	15
40 - 50	y
50 - 60	5
Total	60

Group D 07/10/2022 (Morning)
(a) x = 7, y = 8 (b) x = 6, y = 9
(c) x = 8, y = 7 (d) x = 9, y = 6

Q.80. The variable X takes values 3 and 7, with frequencies of K and K − 2, respectively. If the arithmetic mean of X is 4, then the value of K is:
Group D 11/10/2022 (Morning)
(a) 4 (b) 6 (c) 5 (d) 3

Q.81. Find the mode for the following data of student ages:
16, 17, 15, 17, 16, 15, 14, 14, 13, 17, 13, 12, 12, 16, 10, 14, 17, 10, 11.
Group D 11/10/2022 (Evening)
(a) 15 (b) 16 (c) 17 (d) 11

RRB NTPC CBT - 2 (09/05/2022 to 17/06/2022)

Q.82. The mean of the observations 29 , 36 , 21 , 18 , 7 , 19 , k ,k is 21.25 and mode of the observations 29 , 22 , 15 , 22 , 18 , 21 , p , p is 29. Find the value of (p - k).
Level 6 (09/05/2022) Shift 1
(a) 12 (b) 11 (c) 10 (d) 9

Q.83. The mean of a certain number of observations is 12. If one observation is removed and the mean remains unaltered, then the removed observation is:
Level 6 (09/05/2022) Shift 2
(a) 12 (b) 11 (c) 13 (d) 10

Q.84. If the median of $a, \frac{a}{2}, \frac{2a}{3}, \frac{a}{4}, \frac{3a}{6}$ is 6, then what is the value of a where a is natural number ?
Level 6 (09/05/2022) Shift 2
(a) 11 (b) 10 (c) 9 (d) 12

Q.85. The mode and the mean of a grouped data are 27.5 and 28.5 respectively. Find the median, correct to two places of decimal, using empirical relation.
Level 4 (10/05/2022) Shift 1
(a) 9.83 (b) 19.83 (c) 28.17 (d) 27.17

Q.86. In the data set given below, what is the difference between the Median and the Mode ?
$\{2.1, 5, 6, 7, 8, 9.3, 11, 15, 17, 19.$
$21, 27, 31, 31, 33, 16.5, 14, 10\}$
Level 5 (12/06/2022) Shift 1
(a) 19 (b) 17 (c) 10 (d) 15

Q.87. If assumed mean , a = 142.5, $d_i = x_i$ - a, f_i = frequency of x_i, the i-th value $\Sigma f_i d_i$ = 130.5 and Σf_i = 90 then find the arithmetic mean of all the values of x_i.
Level 2 (13/06/2022) Shift 1
(a) 143.5 (b) 142.95 (c) 142.3 (d) 143.95

Q.88. If 12 is subtracted from each of n values $x_1, x_2, \ldots\ldots, x_n$, then the sum of the resulting numbers is 92. If 8 is subtracted from each of the n values , then the sum of the numbers is 208.What is the mean of the given n values?
(Give your answer correct to one decimal place.)
Level 2 (13/06/2022) Shift 1
(a) 16.7 (b) 13.5 (c) 15.2 (d) 14.8

Q.89. If the ratio of the mode and median is 13 : 9, then find the ratio of the mean and mode using empirical relation.
Level 3 (14/06/2022) Shift 2

(a) 9 : 8 (b) 8 : 13 (c) 8 : 9 (d) 7 : 13

Q.90. What is the Median of 5, 2, 7, 8, 1 and 4 ?
Level 5 (15/06/2022) Shift 1
(a) 4.5 (b) 7 (c) 8 (d) 7.5

Q.91. The variable x takes integer values with $0 \le x \le 4$. If the frequency is given by $f(x) = 1 + x + x(x-1) + \frac{1}{2}x(x-1)(x-2) - \frac{1}{3}x(x-1)(x-2)(x-3)$, then what is the mode of x?
Level 5 (15/06/2022) Shift 2
(a) 1 (b) 3 (c) 2 (d) 4

Q.92. A set of four numbers that begins with the number 53 is arranged from the smallest to largest. If the median is 56, which of the following could possibly be the set of numbers ?
Level 5 (15/06/2022) Shift 2
(a) 53, 57, 61, 65 (b) 53, 53, 57, 59
(c) 53, 55, 57, 58 (d) 53, 56, 59, 62

Q.93. The difference between the mean and the mode of certain observation is 69, then the difference between the mean and the median is _____.
Level 5 (15/06/2022) Shift 3
(a) 24 (b) 21 (c) 23 (d) 22

Q.94. If the mean of numbers 33, x, 47, 83, and 109 is 67, What is the mean of 50, 64, 100, 126, and x ?
Level 5 (15/06/2022) Shift 3
(a) 80.6 (b) 80 (c) 81.8 (d) 84

Q.95. Let x be the median of the data: 16, 78, 26, 91, 29, 71, 31, 46, 9, 51, 54, 56, 61, 21, 62, 65, 73, 86, 41, 89. Let y be the median of the data obtained when 26 and 41 are replaced by 59 and 75, respectively, in the above data. What is the value of $(3x - 2y)$?
Level 2 (16/06/2022) Shift 1
(a) 38 (b) 54 (c) 49 (d) 45

Q.96. If each of the observations of 14, 22, 16, 24, 12, 8, 4, 18, 12, 10 is increased by 10, then what will be their new mean?
Level 2 (16/06/2022) Shift 1
(a) 26 (b) 24 (c) 14 (d) 16

Q.97. There are 12 numbers arranged in ascending order. If the mean of the last 11 numbers is 9 and the mean of all the 12 number is 11, then find the value of the second number, which is $66\frac{2}{3}\%$ more than the first number.
Level 2 (16/06/2022) Shift 2
(a) 54 (b) 53 (c) 55 (d) 56

Q.98. For the classes 10 - 19, 20 - 29, 30 - 39, 40 - 49, 50 - 59, 60 - 69, 70 - 79, 80 - 89, and 90 - 99 of a grouped data. Which one of the following is the upper limit of the class interval 70 - 79
Level 2 (16/06/2022) Shift 2
(a) 79 (b) 70 (c) 79.5 (d) 69.5

Q.99. if the mean of 14, 6, 2a and 16 is 12, then find the value of a where a > 0.
Level 2 (16/06/2022) Shift 3
(a) 8 (b) 6 (c) 5 (d) 4

Q.100. What will be the median of all the prime numbers between 20 and 62 ?
Level 2 (16/06/2022) Shift 3
(a) 38 (b) 42 (c) 41 (d) 39

Q.101. Calculate the value of $\frac{Range}{Median}$ for the set of data given below:
134, 98, 194, 122, 108, 156
Level 2 (16/06/2022) Shift 3
(a) $\frac{48}{67}$ (b) $\frac{3}{4}$ (c) $\frac{48}{61}$ (d) $\frac{8}{9}$

Q.102. {1, 4, 7, 12, 13, 10, 11, 0, 0, 18, 37, 33, 29, 27, 16, 25, 28, 17, 19}
What are the Mean, the Median and the Mode of the above set of data, in the same order, corrected to two decimal places ?
Level 3 (17/06/2022) Shift 1
(a) 0, 16, 16.16 (b) 16, 16.0, 16
(c) 16.16, 16, 0 (d) 16, 0, 16.16

Q.103. Given are the scores of a batsman in the last 10 innings. Find the median score of the batsman in these innings.
65, 180, 81, 6, 63, 27, 122, 8, 165, 50
Level 3 (17/06/2022) Shift 3
(a) 64.5 (b) 64 (c) 65 (d) 63

Q.104. The numbers 4, 6, 10, x, 20, 24, 32 are arranged in ascending order. Find the value of x if their mean and their median are equal.
Level 3 (17/06/2022) Shift 3
(a) 12 (b) 20 (c) 16 (d) 8

RRB NTPC CBT - 1 (28/12/2020 to 31/07/2021)

Q.105. In general , the most appropriate average value in measuring central tendency is.
RRB NTPC 28/12/2020 (Morning)
(a) mode (b) mean (c) median (d) range

Q.106. Given below are the marks obtained by 20 students in mathematics out of 30 marks.
7, 9, 12, 12, 13, 12, 14, 14, 14, 14, 15, 16,17, 18, 18, 19, 20, 18, 20, 13.
Then (2 × median - mode) of the data is equal to.
RRB NTPC 28/12/2020 (Evening)
(a) 14 (b) 0 (c) 12 (d) 18

Q.107. If the ratio of mean and median of a certain data is 4 : 5, then find the ratio of its mean and mode.
RRB NTPC 29/12/2020 (Morning)
(a) 5 : 4 (b) 5 : 7 (c) 3 : 7 (d) 4 : 7

Q.108. The mean of 150 items was found to be 45. If at the time of calculation, two items were wrongly taken as 83 and 76 instead of 38 and 46, then the correct mean is
RRB NTPC 29/12/2020 (Morning)
(a) 44.5 (b) 43.5 (c) 43 (d) 44

Q.109. The marks obtained by 7 students in a class in mathematics are 43, 44, 65, 41, 53, 65 and 62. The mode of the data is
RRB NTPC 04/01/2021 (Morning)
(a) 41 (b) 53 (c) 62 (d) 65

Q.110. The sum of the deviations about the mean is always
RRB NTPC 05/01/2021 (Morning)
(a) positive
(b) zero
(c) the range
(d) the total standard deviation

Q.111. In a frequency distribution, the mid value of a class is 12 and its width is 6. The lower limit of the class is
RRB NTPC 05/01/2021 (Morning)
(a) 12 (b) 9 (c) 6 (d) 18

Q.112. The sum of the class marks of the classes 90-120 and 120-150 is
RRB NTPC 05/01/2021 (Evening)
(a) 220 (b) 240 (c) 170 (d) 210

Q.113. If the mean is 25 and the standard deviation is 5 then the coefficient of variation is:
RRB NTPC 07/01/2021 (Evening)
(a) 20% (b) 48% (c) 60% (d) 27%

Q.114. The mean of a, b,c, d, e and f is 36. If the mean of b, d and f is 28, find the mean of a, c, and e.
RRB NTPC 08/01/2021 (Evening)
(a) 30 (b) 42 (c) 44 (d) 32

Q.115. The following are the weights (in kg) of 25 students, 58,55,53,50,53,51,52, 54,53,52,54,53,58,53,59,55,53,52,51,54,53 ,59,55,53,52.
What is the weight (in kg) of the heaviest student ?
RRB NTPC 09/01/2021 (Morning)
(a) 59 (b) 58 (c) 56 (d) 55

Q.116. The following are the weights (in kg) of 25 students, 58,55,53,50,53,51,52, 54,53,52,54,53,58,53,59,55,53,52,51,54,53 ,59,55,53,52.
What is the most commonly observed weight (in kg)?
RRB NTPC 09/01/2021 (Morning)
(a) 52 (b) 54 (c) 53 (d) 55

Q.117. The following are the weight (in kg) of 25 students.
58,55,53,50,53,51,52,54,53,52,54,53,58,53 ,59,55,53,52,51,54,53,59,55,53,52.
Among the following options, what is the weight (in kg) that appears least number of times in the given data?
RRB NTPC 09/01/2021 (Morning)
(a) 50 (b) 54 (c) 58 (d) 52

Q.118. The following are the weights (in kg) of 25 students.58,55, 53, 50, 53, 51, 52,54,53 52, 54,53,58,53,59,55,53,52,51, 54,53,59,55,53,52
What is the range of the given data?
RRB NTPC 09/01/2021 (Morning)
(a) 6 (b) 7 (c) 9 (d) 8

Q.119. If the mean of the following data is 11, find the value of 'k'.
11, 19, 5,10, k, 13,12, 8, 15,14
RRB NTPC 10/01/2021 (Morning)
(a) 3 (b) 13 (c) 12 (d) 11

Q.120. Find the missing value of p for the following distribution, whose mean is 12.58

x:	5	8	10	12	p	20	25
f:	2	5	8	22	7	4	2

RRB NTPC 11/01/2021 (Morning)
(a) 15 (b) 10 (c) 20 (d) 13

Q.121. The following observations are arranged in ascending order: If the median of the data is 19, then find the value of x.
6, 9, 15, x + 4, x + 8, x + 12, 30, 32
RRB NTPC 12/01/2021 (Evening)
(a) 13 (b) 10 (c) 8 (d) 5

Q.122. The arithmetic mean of x observations is m. If two observations 0 and m are added, then the new mean will be:
RRB NTPC 12/01/2021 (Evening)
(a) $\frac{mx}{x+1}$ (b) $\frac{m}{x+1}$ (c) m (d) $\frac{m(x+1)}{x+2}$

Q.123. If the mean of the following data is 15, then find the value of k.

x	5	10	15	20	25
f	6	k	6	10	5

RRB NTPC 13/01/2021 (Evening)
(a) 7 (b) 8 (c) 6 (d) 10

Q.124. The following table shows the number of students of particular ages in a class of 40 students.. Find the mean age of the students.

Age in years (x)	15	16	17	18	19	20
No. of students (f)	3	8	10	10	5	4

RRB NTPC 13/01/2021 (Evening)
(a) 15.45 (b) 17.45 (c) 18.25 (d) 16.35

Q.125. Find the missing frequency (p) for the following distribution whose mean is 8:

x:	3	5	7	9	11	13
f:	6	8	15	p	8	4

RRB NTPC 16/01/2021 (Morning)
(a) 10 (b) 12 (c) 25 (d) 18

Q.126. Find the mean of the following data:

x:	19	21	23	25	27	29	31
f:	13	15	16	18	16	15	13

RRB NTPC 16/01/2021 (Morning)
(a) 20 (b) 30 (c) 28 (d) 25

Q.127. 40% is the passing criteria in an examination . Out of 9 students who appeared, 4 failed and the remaining received 80%, 55%, 52%, 66%, and 81% marks. The median of the percentage marks is equal to:
RRB NTPC 17/01/2021 (Evening)
(a) 66% (b) 52% (c) 81% (d) 58%

Q.128. The median of the data in ascending order 7, 11, 12, (x - y), (x + y), 20, 21, 29 is 16. Find the value of x.
RRB NTPC 19/01/2021 (Morning)
(a) 15 (b) 16 (c) 12 (d) 14

Q.129. The median of
4, 4, 5, 7, 6, 7, 7, 12, 3 is:
RRB NTPC 19/01/2021 (Evening)
(a) 4 (b) 7 (c) 5 (d) 6

Q.130. Sakshi attended to the following number of clients at the front desk during her internship for 15 days
18, 20, 16, 17, 32, 17, 6, 16, 12, 13, 17, 28, 24, 45, 17
Find the average of the mode and median of the given data.
RRB NTPC 19/01/2021 (Evening)
(a) 17 (b) 19.5 (c) 34 (d) 18.25

Q.131. If mean = (3 median - mode)/p, then the value of p is:
RRB NTPC 20/01/2021 (Morning)
(a) $\frac{1}{3}$ (b) 2 (c) $\frac{1}{2}$ (d) 1

Q.132. Median of 14,14, 15,17,16,17,17,22,13 is:
RRB NTPC 20/01/2021 (Evening)
(a) 16 (b) 15 (c) 17 (d) 14

Q.133. Let a set S = {1, 2, 2, 3, 3, 3, 4, 4, 4, 4}. Then the value of 4 × mean + 2 × mode - 8 × median is.
RRB NTPC 21/01/2021 (Morning)
(a) 10 (b) 4 (c) -4 (d) 14

Q.134. Find the median of the data 40, 50, 30, 20, 80, 70, 90, 50. Next, if 30 is replaced by 120, find the new median.The mean of the two medians found is _____.
RRB NTPC 25/01/2021 (Morning)
(a) 55 (b) 50 (c) 110 (d) 60

Q.135 Find the sum of mean and median of given data.
12,10,16,18,20,26,14,28
RRB NTPC 25/01/2021 (Morning)
(a)18 (b)44 (c)17 (d)35

Q.136. If the mean of $\frac{x}{2}$, x, $\frac{x}{3}$, $\frac{x}{4}$ and $\frac{x}{6}$ is 6, then value of x will be :
RRB NTPC 27/01/2021 (Morning)
(a) 4 (b) $\frac{40}{3}$ (c) 2 (d) $\frac{3}{2}$

Q.137. In the given data if 30 is replaced by 100 then find the difference of the two medians.
80, 90, 40, 30, 20, 10, 70, 60, 50
RRB NTPC 28/01/2021(Morning)
(a) 40 (b) 10 (c) 60 (d) 50

Q.138. Find the mean height of the persons from the following data.

Height (cm)	Number of persons
120	3
130	4
140	5
150	6
160	2

RRB NTPC 28/01/2021(Morning)
(a) 150 cm (b) 145 cm
(c) 160 cm (d) 140 cm

Q.139. If the mean of the following data is k, then find the value of k.
RRB NTPC 28/01/2021 (Evening)

Value	3	2	k	4	5
Frequency	k	2k	3k	4k	5k

(a) 4 (b) 3 (c) 2 (d) 6

Q.140. Find the arithmetic mean of the first 15 natural numbers.
RRB NTPC 29/01/2021 (Evening)
(a) 8 (b) 15 (c) 16 (d) 9

Q.141. Find the sum of the mean, median and mode of the given data.
RRB NTPC 30/01/2021 (Morning)

9, 35, 20, 25, 25, 15, 25
(a) 50 (b) 47 (c) 75 (d) 72

Q.142. The given data is arranged in ascending order and its median is 17. Find the value of x.
8,10,12,15, x, x + 2, 20, 25, 30, 32
RRB NTPC 30/01/2021 (Morning)
(a) 19 (b) 18 (c) 17 (d) 16

Q.143. Three positive integers a, b and c are such that their average is 35 and a ≤ b ≤ c. If the median is (a +18), then what is the lowest possible value of c?
RRB NTPC 31/01/2021 (Morning)
(a) 42 (b) 40 (c) 41 (d) 39

Q.144. The mean of the values 1,2, 3, 4.....n with respective frequencies, 1,2, 3, 4.....n is:
RRB NTPC 02/02/2021 (Morning)
(a) $\frac{n-1}{2}$ (b) $\frac{2n-1}{3}$
(c) $\frac{n+1}{2}$ (d) $\frac{2n+1}{3}$

Q.145. For the data set 1,2,3,5,2,3,4,6,6,8,3,4,5 which of the following options is INCORRECT?
RRB NTPC 09/02/2021 (Morning)
(a) Median > Mode (b) Mean = Median
(c) Mode < Mean (d) Mean = Mode

Q.146. The mean and standard deviation of 100 observations were calculated as 40 and 5.1 respectively by a student who took 50 instead of 40 for one observation. What is the correct mean and standard deviation?
RRB NTPC 10/02/2021 (Evening)
(a) 39.9, 5 (b) 39.09, 5
(c) 39.9, 50 (d) 39.0, 5

Q.147. Nikhil has a mean score of 95 in Maths after 4 quizzes. Then he scored 0 in the next Maths quiz. The new mean score is.
RRB NTPC 11/02/2021 (Morning)
(a) 67.2 (b) 76 (c) 76.2 (d) 67

Q.148. The mass of five meteorites found on earth are 23.5 kg, 15 kg, 20 kg, 22 kg and 16 kg. For this data, which of the following measures is 19.3 kg?
RRB NTPC 11/02/2021 (Morning)
(a) Mode (b) Mean Deviation
(c) Mean (d) Median

Q.149. The mean of a and b is 350 and the ratio of a and b is 2 : 5. What is the value of b - a ?
RRB NTPC 12/02/2021 (Morning)
(a) 400 (b) 330 (c) 300 (d) 325

Q.150. The mean of 6 numbers is 18. If one more number is included, the mean of the 7 numbers will be 20. What is the number that is included?
RRB NTPC 15/02/2021 (Morning)
(a) 10 (b) 20 (c) 32 (d) 30

Q.151. The mean and median of 7 observations are 10 and 9, respectively. If 1 is subtracted from each observation, then the new mean and the new median will respectively be:
RRB NTPC 16/02/2021 (Morning)
(a) 7 and 6 (b) 8 and 9
(c) 9 and 8 (d) 4 and 3

Q.152. The values of the mode and the mean are 7.52 and 9.83 respectively in a moderately asymmetrical distribution. Find the median of the distribution.
RRB NTPC 16/02/2021 (Evening)
(a) 9.00 (b) 8.86 (c) 8.90 (d) 9.06

Q.153. The mean of three numbers is 32. The range of this data set is 28 while the difference between the two smallest numbers is 8. The greatest of the three numbers is.
RRB NTPC 17/02/2021 (Morning)
(a) 48 (b) 50 (c) 51 (d) 52

Q.154. Three positive integers, a, b, and c, are such that their average is 28 and a ≤ b≤ c. If the median is (a +16), then what is the least possible value of c?
RRB NTPC 17/02/2021 (Evening)
(a) 34 (b) 32 (c) 33 (d) 35

Q.155. Find the median and the mode of the following data:
2, 3, 5, 7, 2, 3, 3, 5, 7, and 9.
RRB NTPC 22/02/2021 (Morning)
(a) 4, 3 (b) 3, 3 (c) 4, 4 (d) 3, 4

Q.156. The median of a set of 7 distinct observations is 21.5. If each of the largest 3 observations of the set is increased by 4, then the median of the new set-
RRB NTPC 23/02/2021 (Morning)
(a) will decrease by 4
(b) will be four times the original median
(c) will remain the same as that of the original set
(d) will increase by 4

Q.157. 10 is the mean of a set of 7 observations and 5 is the mean of another set of 3 observations. The mean of the combined set is :
RRB NTPC 27/02/2021 (Morning)
(a) 8.5 (b) 7.5 (c) 15 (d) 10

Q.158. The value of mode and mean are 12.5 and 15.2 respectively, in a moderately asymmetrical distribution. Find the median of the distribution.
RRB NTPC 27/02/2021 (Evening)
(a) 14.0 (b) 14.9 (c) 14.3 (d) 14.5

Q.159. In a moderately asymmetrical distribution, the values of the mode and the mean are 31.5 and 34.2 respectively. Find the median of the distribution.
RRB NTPC 01/03/2021 (Evening)
(a) 34.3 (b) 30.3 (c) 33.3 (d) 33.0

Q.160. The mean of the marks scored by 50 students was found to be 40. Later on it was discovered that a score of 43 was misread as 23. The correct mean is:
RRB NTPC 02/03/2021 (Morning)
(a) 42 (b) 41.5 (c) 40.4 (d) 42.5

Q.161. Calculate the variance from the following data:
3, 6, 5, 2, 4
RRB NTPC 02/03/2021 (Evening)
(a) 3 (b) 2 (c) 2.2 (d) 2.5

Q.162. If the mean of five observations x, x - 1, x - 2, x - 3 and x - 4 is 20, then the mean of the first two observations is..
RRB NTPC 03/03/2021 (Morning)
(a) 23.5 (b) 22.5 (c) 21.5 (d) 20.5

Q.163. Mean of first ten odd natural numbers is:
RRB NTPC 03/03/2021 (Evening)
(a) 10 (b) 11 (c) 9 (d) 19

Q.164. Find the arithmetic mean of 36, 53, 50, 43, 57, 50, 40, 35, 39 and 34.
RRB NTPC 04/03/2021 (Evening)
(a) 43.7 (b) 43 (c) 50 (d) 52.4

Q.165. The mean of 11 numbers is 44. If the mean of the first 6 numbers is 39 and that of the last 6 numbers is 48, then what is the 6^{th} number?
RRB NTPC 04/03/2021 (Evening)
(a) 38 (b) 36 (c) 32 (d) 34

Q.166. Find the median of 7,14,13,12,20,11,15 and 8.
RRB NTPC 04/03/2021 (Evening)
(a) 11 (b) 12 (c) 12.5 (d) 11.5

Q.167. The mean of 20 observations is 50. It was later found that two observations 13 and 24 were incorrectly recorded as 31 and 42. The correct mean is:
RRB NTPC 05/03/2021 (Morning)
(a) 51.85 (b) 47.25 (c) 50 (d) 48.20

Q.168. Find the median of 45, 76, 32, 58, 16, 27, 64 and 35.
RRB NTPC 05/03/2021 (Morning)
(a) 35 (b) 40 (c) 45 (d) 42

Q.169. Find the mean of the following

data.
8, -2, 9, 6, 13, 17, 12
RRB NTPC 05/03/2021 (Evening)
(a) 11 (b) 12 (c) 9 (d) 10

Q.170. A frequency polygon is drawn using_____.
RRB NTPC 07/03/2021 (Morning)
(a) upper boundaries of classes less than cumulative frequencies.
(b) end point of classes and frequencies.
(c) midpoint of classes and frequencies.
(d) lower boundaries of classes greater than cumulative frequencies.

Q.171. In a frequency distribution, if the mid-value of the class is 35 and the value of the lower boundary is 30, then the value of its upper boundary is:
RRB NTPC 09/03/2021 (Evening)
(a) 30 (b) 10 (c) 40 (d) 20

Q.172. If the mode of a series is greater than its mean by 9, then find the difference between the mode and the median.
RRB NTPC 11/03/2021 (Morning)
(a) 10 (b) 6 (c) 8 (d) 4

Q.173. In a frequency distribution, the frequency of the observations 2, 4, 8, 7, and 5 is 5, 3, 2, 6 and 4, respectively.Find the arithmetic mean of this data.
RRB NTPC 11/03/2021 (Evening)
(a) 5 (b) 23 (c) 25 (d) 24

Q.174. Calculate the standard deviation for the following data.
4, 7, 9, 10, 15
RRB NTPC 12/03/2021 (Morning)
(a) 2.733 (b) 3.133 (c) 3.533 (d) 3.633

Q.175. Calculate the standard deviation for the following data.
3,4,5,6,7
RRB NTPC 14/03/2021 (Morning)
(a) $\sqrt{6}$ (b) $\sqrt{3}$ (c) $\sqrt{2}$ (d) 2

Q.176. The mean of 5 observations is 20. If another observation is added, then the mean increases by 2. What is the value of the 6th observation that is added?
RRB NTPC 14/03/2021 (Evening)
(a) 22 (b) 32 (c) 42 (d) 52

Q.177. The values of the mode and the mean are 25.2 and 27.5 respectively in a moderately asymmetrical distribution .Find the value of the median of the distribution.
RRB NTPC 15/03/2021 (Morning)
(a) 26.73 (b) 26.20 (c) 26.75 (d) 26.70

Q.178. If the mean of six observations 5 , 7 , 9 , α , 11 and 12 is 9 , then the value of α is:
RRB NTPC 15/03/2021 (Evening)
(a) 12 (b) 15 (c) 16 (d) 10

Q.179. The variance of the seven observations 6, 7,10,12,13, 8, 14 is:
RRB NTPC 19/03/2021 (Morning)
(a) 9 (b) 9.25 (c) 8.50 (d) 8.29

Q.180. Find the difference between the mean and the median of the following data set: 2, 3, 4, 5, 5, 8, 8
RRB NTPC 21/03/2021 (Morning)
(a) 3 (b) 1 (c) 2 (d) 0

Q.181. Find the median of the given data.
20,28,32,48,20,18,16,2,30,14
RRB NTPC 21/03/2021 (Evening)
(a) 24 (b) 48 (c) 20 (d) 22

Q.182. Find the median of the given data.
25,18,20,16,8,10,15,20,13,30
RRB NTPC 27/03/2021 (Morning)
(a) 30 (b) 17 (c) 20 (d) 15

Q.183. The given data is arranged in ascending order. The median of the data is 63. Find the value of x.
29 , 32 , 48 , 50 , x, x + 2 , 72 , 78 , 84 , 95
RRB NTPC 27/03/2021 (Morning)
(a) 62 (b) 64 (c) 60 (d) 63

Q.184. The median of observations
$k - \frac{3}{2}$, k + 2, k - 1, k + 4, $k + \frac{1}{2}$, k - 3, k + 4
$\frac{1}{2}$ is _____.
RRB NTPC 01/04/2021 (Evening)
(a) $k - \frac{3}{2}$ (b) $k + \frac{1}{2}$ (c) k - 1 (d) k + 2

Q.185. Find the sum of the mean, the median and the mode of the given data.
10, 8, 18, 12, 12, 12
RRB NTPC 03/04/2021 (Evening)
(a) 30 (b) 24 (c) 36 (d) 12

Q.186. In the given data, if 22 is replaced by 52, find the difference between two medians.
26, 15, 8, 32, 18, 22
RRB NTPC 03/04/2021 (Evening)
(a) 2 (b) 3 (c) 5 (d) 6

Q.187. A raw data is in ascending order i.e. 3, 4, 8, x, x +1, 12, 14,15. If the median of this data is 9.5, then the value of x is:
RRB NTPC 05/04/2021 (Morning)
(a) 7 (b) 9 (c) 4 (d) 11

Q.188. Given data is arranged in an ascending order. If the median is 10, then find the value of p.
3, 5, 6, 2p + 3, 3p + 2, 15, 25, 51.
RRB NTPC 06/04/2021 (Evening)
(a) 3 (b) 27.5 (c) 38 (d) 2

Q.189. Histogram is used to find:
RRB NTPC 07/04/2021 (Evening)
(a) arithmetic mean graphically
(b) Median, mode and mean graphically
(c) median graphically
(d) mode graphically

Q.190. Read the given data and answer the question that follows.
2,5,15,25,20,12,8,7,6,16,21,17,30,32,23,40, 51,15,2,9,57,19,25.
If the given data is grouped in the classes 0-5, 5-10, 10-15, and so on, then what will be the frequency of the class 20-25?
RRB NTPC 07/04/2021 (Evening)
(a) 4 (b) 3 (c) 5 (d) 2

Q.191. Find the median and the mode for the following set of numbers.
2 , 2 , 3 , 5 , 5 , 5 , 6 , 8 , 9
RRB NTPC 07/04/2021 (Evening)
(a) Median = 5, Mode = 5
(b) Median = 0, Mode = 9
(c) Median = 2, Mode = 5
(d) Median = 5, Mode = 2

Q.192. The mean of x and y is 400 and the ratio of x to y is 3 : 7. What is the value of y - x?
RRB NTPC 07/04/2021 (Evening)
(a) 130 (b) 800 (c) 320 (d) 230

Q.193. What is the median of the following data?
78 , 56 , 22 , 34 , 45 , 54 , 39 , 68 , 54 , 84
RRB NTPC 08/04/2021 (Morning)
(a) 55 (b) 51 (c) 54 (d) 53

Q.194. Find the mean of x + 77, x + 7, x + 5, x + 3 and x - 2.
RRB NTPC 08/04/2021 (Morning)
(a) x - 3 (b) x + 8 (c) x - 8 (d) x + 18

Q.195. If the standard deviation of a set of numbers is 3 and the arithmetic mean of these numbers is 6, what is the coefficient of variation of these numbers?
RRB NTPC 08/04/2021 (Morning)
(a) 125 (b) 75 (c) 50 (d) 100

Q.196. If mean of the following distribution is 26, then what is the value of k?

class	0-10	10-20	20-30	30-40	40
Frequency	8	10	K	6	12

RRB NTPC 08/04/2021 (Evening)
(a) 8 (b) 1 (c) 4 (d) 10

Q.197. Mean of the numbers 2,4,5,8,2

and 3 is m. The numbers 4,3,3,5,m,3 and p have mean m + 1, median q and mode r. What is the value of (p + q - r)?
RRB NTPC 08/04/2021 (Evening)
(a) 13 (b) 21 (c) 20 (d) 14

Q.198. If the mean of observations $x_1, x_2, x_3, \ldots, x_n$ is $\bar{x}$, then:
RRB NTPC 24/07/2021 (Morning)
(a) $\sum_{i=1}^{n}(x_i - \bar{x}) = 0$ (b) $\sum_{i=1}^{n}(x_i + \bar{x}) = 0$
(c) $\sum_{i=1}^{n}(x_i - \bar{x})^2 = 0$ (d) $\sum_{i=1}^{n}(\bar{x} - x_i) = 0$

Q.199. Mean of the given observations x + 1, x + 3, x + 5, x + 7 and x + 9 is 6 , then the value of x is:
RRB NTPC 24/07/2021 (Morning)
(a) 5 (b) 6 (c) 3 (d) 1

Q.200. The following table gives a frequency distribution whose arithmetic mean is 33. Find the product of the possible values of K from the distribution.

Value(x)	Frequency(f)
29	4
30	3
30 + k	3k
34	2
62	1

RRB NTPC 24/07/2021 (Evening)
(a) 4 (b) 3 (c) 5 (d) 2

Q.201. If ${}^{n}C_3 = {}^{n}C_8$, then find n.
RRB NTPC 26/07/2021 (Evening)
(a) 12 (b) 10 (c) 14 (d) 11

RRB JE (22/05/2019 to 28/06/2019)

Q.202. Find the median of the discrete values.
RRB JE 27/05/2019 (Afternoon)
(a + 4) , (a - 3.5) , (a - 2.5) , (a - 3) , (a - 2), (a + 0.5), (a + 5) and (a - 0.5).
(a) a - 0.75 (b) a - 1.5
(c) a - 1.25 (d) a - 2.5

Q.203. Ten observations written in descending order are 45, 34, 32, 30, 2x - 13, x + 1, 17, 15, 14 and 8. If the median is 24, then find 'x'.
RRB JE 28/05/2019 (Morning)
(a) 15 (b) 20 (c) 12 (d) 18

Q.204. Find the standard deviation of the first 'n' natural numbers.
RRB JE 02/06/2019 (Afternoon)
(a) $\sqrt{\frac{n^2-1}{12}}$ (b) $\frac{n(2n+1)}{3}$
(c) $\sqrt{\frac{n^2+1}{6}}$ (d) $\frac{n(n+1)}{12}$

Q.205. If the mid value of a class is 20 and the width of the class is 5, find the lower and upper limits of the class.
RRB JE 02/06/2019 (Evening)
(a) 17 - 22 (b) 17.5 - 22.5
(c) 17 - 23 (d) 18 - 22

Q.206. The mean of x, x + 3, x + 5, x + 7, x + 10 is 9. What is the mean of the first 3 observations?
RRB JE 28/06/2019 (Evening)
(a) 7 (b) 6.66 (c) 7.8 (d) 7.3

RRB ALP Tier - 2 (21/01/2019 to 08/02/2019)

Q.207. The mean of 1, 4, 9, X, 12, 14, 15 and 16 is 10. Find the mode.
ALP Tier II 21/01/2019 (Afternoon)
(a) 10 (b)11 (c) 9 (d)12

Q.208. Find the mean of first 100 natural numbers?
ALP Tier II 21/01/2019 (Afternoon)
(a) 50 (b) 51.5 (c) 50.5 (d) 51

Q.209. Find the mean of 2, 5, 8, 14, 21?
ALP Tier II 21/01/2019 (Morning)
(a) 9 (b) 10 (c) 9.5 (d) 8.5

Q.210. If the median of the numbers 9, 15, 1, 15, 14, 9, 4 and x is 11, then find the value of x.
ALP Tier II 23/01/2019 (Afternoon)
(a) 11 (b) 13 (c) 10 (d) 12

Q.211. If the mean of x + 45, x − 32, x + 25, x + 13 and x − 21 is 12, then what will be the mean of the last three observations?
ALP Tier II 08/02/2019 (Morning)
(a) 15.67 (b) 14.67 (c) 12.67 (d) 11.67

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.212. The mean height of 25 boys in a class is 150cm, and the mean height of 35 girls in the same class is 145 cm. The combined mean height of 60 students in the class is _____(approximately)
RRB ALP 09/08/2018 (Afternoon)
(a) 147 (b) 145 (c) 146 (d) 143

Q.213. Four numbers, when arranged in ascending order, are w, x, y and z. The average of the smallest three numbers is 18, while the average of the largest three was 22. What is the range of the data ?
RRB ALP 09/08/2018 (Evening)
(a) 10 (b) 11 (c) 12 (d) 13

Q.214. In a cricket match, the scores of the players are considered such that coefficient of variation of scores is 16 and mean is 25.then the variance is :
RRB ALP 14/08/2018 (Morning)
(a) 12 (b) 8 (c) 16 (d) 4

Q.215. If A, B and C are denoting Mean, Median and Mode of a data and A : B = 9 : 8 then the ratio of B : C is:
RRB ALP 17/08/2018 (Afternoon)
(a) 5 : 4 (b) 8 : 9 (c) 7 : 6 (d) 4 : 3

Q.216. The sum of 15 observations of a data is (434 + x) If the mean of the data is x, then the value of x is
RRB ALP 20/08/2018 (Afternoon)
(a) 25 (b) 33 (c) 27 (d) 31

Q.217. A sequence a, ax, ax^2 _____ ax^n has odd number of terms. Then the median is
RRB ALP 20/08/2018 (Evening)
(a) $ax^{\frac{n}{2}+1}$ (b) ax^{n-1}
(c) $ax^{\frac{n}{2}-1}$ (d) $ax^{\frac{n}{2}}$

Q.218. The following table shows the gain in weight by 25 children in a year. What is the mean value of gain in weight?

Gain in weight (in kg)	No. of children
1.5	4
2	5
2.4	8
3	5
3.2	2
3.4	1

RRB ALP 29/08/2018 (Afternoon)
(a) 3.2 (b) 2.1 (c) 2.4 (d) 1.9

Q.219. The mean of the 5 smallest numbers from a group is 15 while the mean of all the numbers of the group taken together is 17. If the mean of the numbers leaving the smallest five out is 18.25, how many numbers were there in the group in all?
RRB ALP 29/08/2018 (Afternoon)
(a) 14 (b) 8 (c) 13 (d) 12

Q.220. Given below are the ages (in years) of a group of children. What is the median age?
7, 9, 8, 6, 5, 3, 9, 2.
RRB ALP 31/08/2018 (Morning)
(a) 6.5 (b) 5 (c) 6.125 (d) 6

Answer key:-

1.(b)	2.(c)	3.(d)	4.(d)
5.(a)	6.(c)	7.(b)	8.(a)
9.(d)	10.(c)	11.(a)	12.(b)
13.(b)	14.(d)	15.(d)	16.(d)
17.(a)	18.(c)	19.(d)	20.(c)
21.(a)	22.(b)	23.(c)	24.(a)
25.(b)	26.(d)	27.(d)	28.(a)
29.(c)	30.(c)	31.(a)	32.(c)
33.(d)	34.(d)	35.(b)	36.(c)
37.(b)	38.(b)	39.(b)	40.(b)
41.(d)	42.(c)	43.(b)	44.(d)
45.(b)	46.(c)	47.(d)	48.(b)
49.(c)	50.(c)	51.(b)	52.(d)
53.(a)	54.(a)	55.(a)	56.(a)
57.(b)	58.(d)	59.(c)	60.(d)
61.(c)	62.(c)	63.(b)	64.(b)
65.(d)	66.(c)	67.(d)	68.(a)
69.(c)	70.(a)	71.(c)	72.(c)
73.(a)	74.(b)	75.(d)	76.(d)
77.(b)	78.(a)	79.(c)	80.(d)
81.(c)	82.(d)	83.(a)	84.(b)
85.(c)	86.(b)	87.(d)	88.(c)
89.(d)	90.(a)	91.(d)	92.(c)
93.(c)	94.(a)	95.(d)	96.(b)
97.(c)	98.(c)	99.(b)	100.(b)
101.(b)	102.(c)	103.(b)	104.(c)
105.(b)	106.(a)	107.(d)	108.(a)
109.(d)	110.(b)	111.(b)	112.(b)
113.(a)	114.(c)	115.(a)	116.(c)
117.(a)	118.(c)	119.(a)	120.(a)
121.(a)	122.(d)	123.(b)	124.(b)
125.(c)	126.(d)	127.(b)	128.(b)
129.(d)	130.(a)	131.(b)	132.(a)
133.(c)	134.(a)	135.(d)	136.(b)
137.(b)	138.(d)	139.(a)	140.(a)
141.(d)	142.(d)	143.(c)	144.(d)
145.(d)	146.(a)	147.(b)	148.(c)
149.(c)	150.(c)	151.(c)	152.(d)
153.(a)	154.(a)	155.(a)	156.(c)
157.(a)	158.(c)	159.(c)	160.(c)
161.(b)	162.(c)	163.(a)	164.(a)
165.(a)	166.(c)	167.(d)	168.(b)
169.(c)	170.(c)	171.(c)	172.(b)
173.(a)	174.(d)	175.(c)	176.(b)
177.(a)	178.(d)	179.(d)	180.(d)
181.(c)	182.(b)	183.(a)	184.(b)
185.(c)	186.(a)	187.(b)	188.(a)
189.(d)	190.(b)	191.(a)	192.(c)
193.(c)	194.(d)	195.(c)	196.(c)
197.(d)	198.(a)	199.(d)	200.(d)
201.(d)	202.(c)	203.(b)	204.(a)
205.(b)	206.(b)	207.(c)	208.(c)
209.(b)	210.(b)	211.(d)	212.(a)
213.(c)	214.(c)	215.(d)	216.(d)
217.(d)	218.(c)	219.(c)	220.(a)

Solution:-

Sol.1.(b) The mean of 36 numbers = 42
The sum of the all 36 numbers = 36 × 42 = 1512
But, 47 was misread as 41; So, original average = $\frac{1512+6}{36} = 42.17\%$

Sol.2.(c) Arranging in ascending order;
11, 15, 16, 17, 18, 22, 33, 51, 71, 75
Median = $\frac{5th+6th}{2} = \frac{18+22}{2} = 20$

Sol.3.(d) From the given table, the maximum class frequency = 12, and the corresponding class interval = 6-8(Modal Class)
The lower limit of modal class, l = 6

Class size, h = 8 - 6 = 2

Frequency of modal class, f1 = 12

Frequency of class proceeding to modal class, f0 = 8

Frequency of class succeeding to modal class, f2 = 6

Using formula, the mode of the grouped data = $l + \left(\frac{f_1-f_0}{2f_1-f_0-f_2}\right) \times h$

=6 + $\left(\frac{12-8}{24-8-6}\right) \times 2$ = 6 + $\left(\frac{4}{10}\right)$ × 2 = 6 + $\frac{4}{5}$ = $\frac{34}{5}$ = 6.8

Sol.4.(d) 2 , 2 , 3 , 5 , 15 , 15 , 15 , 15 , 20 , 21 , 23 , 23 , 25 , 25
Mode = highest frequency of number = 15

Sol.5.(a)

Class-interval	Frequency	Commulative -frequency
(0 - 50)	12	12
(50 - 100)	15	27
(100 - 150)	13	40
(150 - 200)	10	50

Total number of terms = 50
Median = 25th and 26th term.
So, Median class = (50 - 100)

Sol.6.(c) Mode = 3 Median - 2 Mean
⇒ 23 = 3 Median - 2 × 65
⇒ 3 Median = 23 + 130
⇒ 3Median = 153 ⇒ Median = 51

Sol.7.(b)

Median = L + $\frac{\frac{N}{2} - CF_0}{F} \times H$

Sol.8.(a) Mode = 3 Median - 2 mean
⇒ $15 = 3 \times 12 - 2\,mean$
⇒ $2\,mean = 36 - 15 \Rightarrow Mean = \frac{21}{2}$
Now, 3 × mean = $\frac{63}{2}$

Sol.9.(d) Arranging the given data in ascending order →
5, 7, 8, 8, 8, 9, 9,9, 9
Mean = $\frac{5+7+8+8+8+9+9+9+9}{9}$
= $\frac{72}{9}$ = 8
Median → $\frac{9th\ term+1}{2}$ = 5th term ⇒8
Mode → 9 (most occurred term)

Sol.10.(c) K = $\frac{2+3+4+k}{4}$
4K = 9 + k ⇒ K = 3
Numbers = 2, 3, 4 and 3
Mode = 3

Sol.11.(a) Mean = $\frac{4+5+6+7+8+12+9+12+5+12}{10}$
= $\frac{80}{10}$ = 8
Mode : Here most repeated observations is 12 (repeated 3 times), so mode = 12
Required difference = Mode – Mean = 12 – 8 = 4

Sol.12.(b) Prime numbers between 10 to 22 are 11, 13, 17 and 19
Mean = $\frac{11+13+17+19}{4} = \frac{60}{4} = 15$

Sol.13.(b) 60, 68, 70, 72, 74, 76, 78, 80
Median = $\frac{72+74}{2}$ = 73
When 70 is removed,
60, 68, 72, 74, 76, 78, 80
New median = 74 ,
Difference = 74 - 73 = 1

Sol.14.(d) Mean = 184 , Median = 178
We know, 3 × median = 2 × mean + mode
3 × 178 = 2 × 184 + Mode
Mode = 534 - 368 = 166

Sol.15.(d) We know, the formula of coefficient of variation = $\frac{\sigma}{\mu} \times 100$

Where σ = standard deviation of the given data set and μ = mean of the given data set.
Now, mean is 40 and standard deviation is 5, then C.V (Coefficient of variation) is
$= \frac{5}{40} \times 100\% = \frac{1}{8} \times 100\% = 12.5\ \%$

Sol.16.(d) Given data : - 6, 7, 5, 9, 12,15
Mean (x)
$= \frac{6+7+5+9+12+15}{6} = \frac{54}{6} = 9$
No. of terms = N = 6
Variance = $\frac{\sum(X-x)^2}{N}$ =
$\frac{(6-9)^2+(7-9)^2+(5-9)^2+(9-9)^2+(12-9)^2+(15-9)^2}{6}$
$= \frac{9+4+16+0+9+36}{6} = \frac{74}{6} = \frac{37}{3}$

Sol.17.(a) Standard Deviation can not take a negative value.

Sol.18.(c) σ_{20}(Variance of 20 observation) = 5
Old Variance x k^2 = New Variance
5 x 2^2 = New Variance

Sol.19.(d) Given that
Variance of 5 values = 0. 64
Standard deviation = $\sqrt{variance}$
$= \sqrt{0.64} = 0.8$

Sol.20.(c) Mean of the first 'N' consecutive odd numbers is always N.
Therefore, the mean of the first 10 consecutive odd numbers is 10.

Sol.21.(a) First five Triangular Numbers = 1, 3, 6, 10, 15
So, the required
mean = $\frac{1+3+6+10+15}{5} = \frac{35}{5} = 7$

Sol.22(b)

Mean = $\frac{\sum f_i x_i}{\sum f_i}$, $where\ x_i = class\ mark$

$and\ f_i = frequency$

Sol.23.(c) Arithmetic Mean
$= \frac{5+15+23+26+29}{5} = \frac{98}{5} = 19.6$

Sol.24(a) $\frac{Mode - Mean}{3}$
$= Median - Mean$
$\Rightarrow Mode - Mean = 3\ Median - 3\ Mean$
$\Rightarrow Mode = 3\ Median - 3\ Mean + Mean$
$\Rightarrow Mode = 3\ Median - 2\ Mean$

Sol.25(b)

Class	Frequency	C.F
(0 - 10)	2	2
(10 - 20)	4	6
(20 - 30)	7	13
(30 - 40)	9	22
(40 - 50)	10	32
(50 - 60)	12	44
(60 - 70)	6	50

Number of term n = 50
N/2 = 25 , Median-class = (40 - 50) , l = 40 , C.F = 22 , h = 10 , f = 10
Median = $l + \frac{\frac{N}{2} - C.F}{f} \times h$
$= 40 + \frac{25-22}{10} \times 10 = 43$

Sol.26(d)
$\frac{11+17+x+1+3x+19+2x-4+x+5}{7}$
$= 21 \Rightarrow 7x + 49 = 147$
$\Rightarrow 7x = 147 - 49$
$\Rightarrow 7x = 98 \Rightarrow x = 14$
11, 17, 15, 42, 19, 24, 19;
Mode = 19

Sol.27.(d)

x	f	xf
3	3	9
5	4	20
9	x	9x
2	8	16

Mean = $\frac{9+20+9x+16}{3+4+x+8}$
$\Rightarrow \frac{45+9x}{15+x} = 4$
$\Rightarrow 9x + 45 = 4x + 60$
$\Rightarrow 9x - 4x = 60 - 45$
$\Rightarrow 5x = 15 \Rightarrow x = 3$

Sol.28.(a)

Class	Frequency	Commulative-frequency
50 - 60	6	6
60 - 70	8	14
70 - 80	15	29
80 - 90	20	49
90 - 100	11	60

Total frequency (N) = 60
N/2 = $\frac{60}{2} = 30$
So, the C.F. corresponding to this is (80 - 90)
Now,
l = 80 , CF = 29 , f = 20 and h = 10
Median = l + $\frac{\frac{N}{2} - CF}{f}$ × h
= 80 + $\frac{30-29}{20}$ × 10
= 80 + 0.5 = 80.5

Sol.29.(c) Modal class = (130 - 140)
Lower limit = 130, and double of lower limit = 2 × 130 = 260

Sol.30.(c)

x	f	xf
3	5	15
2	3	6
10	4	40
4	2	8
5	6	30
Total	20	99

Mean = $\frac{99}{20} = 4.95$

Sol.31.(a)

Xi	Wi	XiWi
4	1	4
3	0	0
5	2	10
7	1	7
2	3	6
1	5	5
Total	12	32

Weighted mean = $\frac{\Sigma xiwi}{\Sigma wi} = \frac{32}{12} = 2.66$

Sol.32.(c)

x	f
0-10	5
10-20	8
20-30	10
30-40	2
40-50	5

We know that mode = l + $\frac{f_1 - f_0}{2f_1 - f_0 - f_2}$ × h (l = lower limit of interval of modal class
h = size of class interval
f_1 = frequency of model class
f_0 = frequency of class preceding the modal class
f_2 = frequency of class succeeding the modal class)
Here we can see, maximum frequency(f_1) = 10
So modal class = 20 - 30
h = 30 - 20 = 10
f_0 = 8 f_2 = 2 l = 20
Mode = 20 + $\frac{10-8}{2\times10-8-2}$ × 10
= 20 + 2 = 22

Sol.33.(d) Mode = 3 Median - 2 Mean
$\Rightarrow 60 = 3\ Median - 2 \times 42$
$\Rightarrow 3Median = 60 + 84$
$\Rightarrow Median = \frac{144}{3} = 48$

Sol.34.(d)
$\frac{22.5+56+42.5+2x+1+x-2+3x+36}{7}$
$= 30$
$\Rightarrow 156 + 6x = 210 \Rightarrow 6x = 54 \Rightarrow x = 9$

Sol.35.(b)

Class	f	C.F
0 - 10	10	10
10 - 20	8	18
20 - 30	7	25
30 - 40	9	34
40 - 50	12	46

Total frequency(N) = 46

N/2 = $\frac{46}{2} = 23$

So , the C.F. corresponding to this is (20-30)

Now, l = 20 , CF = 18 , f = 7 and h = 10

Median = l+ $\frac{\frac{N}{2} - CF}{f}$×h

= 20 + $\frac{23-18}{7}$ × 10 = 20 + $\frac{50}{7} = \frac{190}{7}$

Sol.36.(c) 9, 11, 15, 17, x, 19, 21

N = 7

Median = 4th term that is 17

Here median and the 5th term are the same , if x is greater than 17 then median should also be greater than 17, which contradicts the series, so x should be greater than 15 and less than than 17, i.e, 16. So, x = 16.

Sol.37.(b)

Class	Frequency	C.F
30 - 40	5	5
40 - 50	18	23
50 - 60	15	38
60 - 70	22	60
70 - 80	27	87
80 - 90	13	100

C.F of the preceding the median class = 60 - 22 = 38

Sol.38.(b) For set A,

$Mode_A = 3Median_A - 2\ Mean_A$ ..... (1)

$Mean_A = Mean_B$

$and \quad Median_B = 2(Median_A)$

For set B,

$Mode_B = 3\ Median_B - 2\ Mean_B$

$\Rightarrow Mode_B = 3(2\ Median_A) - 2Mean_A$ ..... (2)

Subtracting eq .(1) from (2), we get

$Mode_B$ - $Mode_A$ = 3 $Median_A$

Sol.39.(b) Wages of employees in ascending order

5000 , 6000 , 8000 , 8500 , 9300 , 9500

So, median = $\frac{8000+8500}{2}$ = ₹8250

Sol.40.(b)

class	Freq .(f_i)	midpoint (x_i)	$f_i x_i$
0 - 20	7	10	70
20-40	11	30	330
40-60	x	50	50x
60-80	9	70	630
80-100	y	90	90y
Total	27+x+y		1030 + 50x + 90y

Total frequency $\Rightarrow 7 + 11 + x + 9 + y = 50$

$\Rightarrow x + y = 23$ ..... (i)

$\Rightarrow x = 23 - y$

Mean = $\frac{\Sigma f_i x_i}{\Sigma f_i}$; 54 = $\frac{1030 + 50x + 90y}{27 + x + y}$

⇒54(27+x+y) = 1030 + 50x + 90y

⇒1458 + 54x + 54y = 1030 + 50x + 90y

⇒4x + 428 = 36y ⇒ x + 107 = 9y .....(ii)

After putting $x = 23 - y$, in equation (ii)

$23 - y + 107 = 9y \Rightarrow y = 13$

x= 23-13 = 10

Required value = 2x + 3y = 2 x 10 = 3 x 13 = 59

Sol.41.(d) $Mode = 3\ Median - 2\ Mean$

$\Rightarrow 61.1 = 3\ Median - 2 \times 58.7$

$\Rightarrow 3\ Median = 61.1 + 117.4$

$\Rightarrow 3\ median = 178.5 \Rightarrow Median = 59.5$

Sol.42.(c) $Mode = 3\ Median - 2\ Mean$

$\Rightarrow Mode = 3 \times 32 - 2 \times 28.5$

$\Rightarrow Mode = 96 - 57 \Rightarrow Mode = 39$

Sol.43.(b) Given,

$Median = Mode - 24.12$;

$\Rightarrow Mode = Median + 24.12$

Formula $\Rightarrow Mode = 3\ Median - 2\ Mean$

$\Rightarrow Median + 24.12 = 3\ Median - 2\ Mean$

$\Rightarrow 3\ Median - Median = 2\ Mean + 24.12$

$\Rightarrow 2\ (Median - Mean) = 24.12$

$\Rightarrow (Median - Mean) = 12.06$

So, the median of the data exceeds its mean by 12.06

Sol.44.(d) Mean height = $\frac{160+175+142+136+148+182}{6}$

$= \frac{943}{6} = 157.17$ cm

Sol.45.(b)

Class	Frequency	C.F
100 - 150	22	22
150 - 200	18	40
200 - 250	25	65
250 - 300	15	80
300 - 350	20	100

Median = $L + \frac{\frac{N}{2} - c_f}{f} \times h$

Where, L = lower limit of median class

c_f = cumulative frequency of the class prior to median class

h = width of median class

f = frequency of median class

Median ,

$= 200 + \frac{\frac{100}{2} - 40}{25} \times 50 = 220$

Sol.46.(c) We know that ,

3 median = 2 mean + mode

3 × median = 2×20.1 +24.6

3 × median =64.8

Therefore, median = 21.6

Sol.47.(d) By arranging the numbers in ascending order

66,66,66,69,69,69,69,71,71,71,73,74,74,74 ,83,83,83,83,83,84,84,84,90,90

The most frequent number (mode) = 83

Sol.48.(b)

Xi	fi	$Xi.fi$
10	5	50
15	x	$15x$
20	7	140
25	8	200
Total	$20 + x$	$390 + 15x$

Mean = $\frac{Xi.fi}{Xi} \Rightarrow \frac{390+15x}{20+x} = 18$

$\Rightarrow 18(20 + x) = 390 + 15x$

$\Rightarrow 360 + 18x = 390 + 15x$

$\Rightarrow 18x - 15x = 390 - 360$

$\Rightarrow 3x = 30 \Rightarrow x = 10$

Sol.49.(c) Mean = $\frac{10\times17 + 30\times28 + 50\times32 + 70\times24 + 90\times19}{17+28+32+24+19}$

= $\frac{6000}{120}$ = 50

Sol.50.(c) mean of observations = $\frac{sum\ of\ observations}{number\ of\ the\ observations}$

⇒

$\frac{39 + 49 + 59 + 60 + 70 + 80 + 90 + 93 + 90}{9}$

= $\frac{630}{9}$ = 70

Sol.51.(b) By arranging the observations in ascending order,

20, 20, 20, 20, 20, 20, 23, 25, 30, 31, 32, 35, 41, 42, 43

So, median = 25

Sol.52.(d) Arithmetic Mean

= $\frac{3+6+8+10+12+14+18+24+31}{9}$

= $\frac{126}{9} = 14$

Sol.53.(a) Let us prepare the following table to compute the median :-

Number of letters	Number of surnames (Frequency)	Cumulative frequency
1-4	6	6
4-7	30	36
7-10	40	76
10-13	16	92
13-16	4	96
16-19	4	100 = n

We have, n = 100 , $\frac{N}{2}$ = 50

The cumulative frequency just greater than n/2 is 76 and corresponding class 7 - 10

Thus, 7-10 is the median class such that

n/2 = 50, l = 7, f= 40, cf =36, and h=3,
Substitute these values in the formula

Median, M = l + $h\left(\frac{\frac{n}{2}-cf}{f}\right)$

M = 7 + 3 ($\frac{\frac{100}{2}-36}{40}$) ⇒ M = 8.05

Sol.54.(a) The maximum class frequency is 30 and the class interval corresponding to this frequency is 55-65.
Thus the modal class is 55-65
Lower limit of the class modal(l) = 55
Size of the class interval(h) = 10
Frequency of the modal class(f_1) = 30
Frequency of the class preceding the modal class(f_0) = 25
Frequency of the class succeeding the modal class(f_2) = 20
Substituting in
Mode = l + (f_1 - f_0)/(2f_1 - f_0 - f_2) x h

Mode = 55 + $\frac{30-25}{60-25-20}$ x 10

Mode = 55 + $\frac{5}{15}$ x 10

Mode = 55 + 3.33
Mode = 58.33

Sol.55.(a) Arranging in ascending order,
11, 13, 13, 13, 15, 17, 17, 18, 18, 19
Mode is the value which occurs the maximum number of times in the given data set. Hence, Mode = 13

Sol.56(a) $Mode = 3\ Median - 2\ mean$
$\Rightarrow 27 = 3 \times 35 - 2Mean$
$\Rightarrow 2\ Mean = 105 - 27$
$\Rightarrow 2\ Mean = 78 \Rightarrow Mean = 39$

Sol.57.(b) Series - 5, 18, 6, 7, 6, 2, 3, 4, 24, 2, 7, 21, 2, 81
On arranging - 2, 2, 2, 3, 4, 5, 6, 6, 7, 7, 18, 21, 24, 81
Here, 2 is the most repeated term.
So, mode = 2

Sol.58.(d) Mean
= $\frac{25\times5+30\times6+35\times3+40\times1}{5+6+3+1}$ = 30

Sol.59.(c)
4, 8, n - 14 , 17 , n + 5 , 30, 32 and 35
Median = $\frac{17+n+5}{2}$

$\Rightarrow \frac{17+n+5}{2} = n - 1$

$\Rightarrow n + 22 = 2n - 2 \Rightarrow n = 24$

Sol.60.(d)
Mode - Median = 2(Median - Mean)
= Mode = 3 × Median - 2 × Mean
So, option d is correct.

Sol.61.(c)
29, 32, 48, 50, x, x + 2 , 72, 78, 84, 95
Median = $\frac{x+x+2}{2}$

$\Rightarrow \frac{x+x+2}{2} = 63 \Rightarrow 2x + 2 = 126$

$\Rightarrow 2x = 124 \Rightarrow x = 62$
Hence, the value of x is 62.

Sol.62.(c) Arranging in ascending order,
33, 35, 41, 46, 55, 58, 64, 77, 87, 90, 92
Median = 5th term = 58
After arranging new pattern,
33 , 35, 43, 46, 55, 58, 64, 77, 87, 90, 99
New median = 5th term = 58
Now, old median - new median
= 55 - 55 = 0

Sol.63.(b) Arranging in ascending order,
21, 22, 22.5, 23, 23.5, 24, 24.5, 25, 26, 26
Here total observation is 10 which is even so the formula to calculate median when the observation is even

Median = [$(\frac{n}{2})$th term +$(\frac{n}{2}+1)$th term] ÷ 2
Here n = 10
Median = $\frac{5th+6th}{2} = \frac{23.5+24}{2}$ = 23.75

Sol.64.(b)
35, 42, 56, 44, 55, 44, 36, 44, 49 and 65 .
Hence, mode of the given weights = 44 kg

Sol.65.(d) 5, 6, 7, 9, 10, 12 and 14.
Mean = $\frac{5+6+7+9+10+12+14}{7}$

= $\frac{63}{7} = 9$

Deviation = (5 - 9) + (6 - 9) + (7 - 9) + (9 - 9) + (10 - 9) + (12 - 9) + (14 - 9)
= - 4 + (-3) + (-2) + 0 + 1 + 3 + 5 = 0

Sol.66.(c)
35, 42, 56, 44, 55, 44, 38, 44, 49 ,35
Here , n = 10
So modal weight = average of $\frac{n}{2}th$ term and $\left(\frac{n}{2}+1\right)th$ term
In ascending order → 35 , 35 , 38 , 42 , 44 , 44 , 44 , 49 , 55 , 56
Required modal weight = $\frac{44+44}{2}$ = 44 kg.

Sol.67.(d) 146, 150, 147, 143, 158, 139, 154, 149, 151, 155
Mean= $\frac{146+147+143+158+139+154+149+151+155+150}{10}$

$= 149.2\ mm$

Sol.68.(a)

x_i	f_i	Cumulative Frequency
1	5	5
2	7	12
3	4	16
4	8	24
5	2	26

N= 26 which is even
⇒ N = $\frac{26}{2}$ = 13
Cumulative frequency just greater than 13 is 16 which is in class 3 .
Median is 3.

Sol.69.(c) Arranging in ascending order,
1, 2, 2, 3, 3, 3, 4, 4,5, 6
So, the mode of the given data is 3

Sol.70.(a)
Let the first consecutive number be x .
$x + x + 1 + x + 2 = 177$
$\Rightarrow 3x = 177 - 3$
$\Rightarrow 3x = 174 \Rightarrow x = 58$
Numbers are 58 , 59 , 60
Hence, the mean = 59:-
Alternate:-
Mean = $\frac{Sum\ of\ the\ given\ number}{total\ number}$

= $\frac{177}{3}$ = 59

Sol.71.(c)

class	Frequency	C.F
0 - 10	8	8
10 - 20	7	15
20 - 30	9	24
30 - 40	12	36
40 - 50	11	47

$\frac{N}{2} = \frac{47}{2} = 23.5$
Median class = 20 - 30
Median = $l + \frac{\frac{N}{2}-CF}{f} \times h$

= $20 + \frac{23.5-15}{9} \times 10 = \frac{265}{9}$

Sol.72.(c)

Mark	No. of students	C.F.
8	11	11
11	14	25
16	9	34
20	5	39
22	8	47
29	3	50

Here , n = 50 Then
Median will be the average of $\frac{n}{2}th$ value and $\left(\frac{n}{2}+1\right)th$ value = 25th and 26th
25th student got 11 mark and 26th student got 16 mark
So , median = $\frac{11+16}{2}$ = 13.5 marks.

Sol.73.(a)

x	f	xf
5	3	15

10	5	50
15	6	90
20	2	40
25	1	25
30	3	90

Mean = $\frac{\Sigma xf}{\Sigma f}$

$= \frac{15+50+90+40+25+90}{20}$

$= \frac{310}{20} = 15.5$

Sol.74.(b) Given data :
15, 12, 13, 14, 16, 15, 18, 19, 11, 15
as Mode is the most frequent number
∴ Mode = 15

Sol.75.(d)
12, 12, 13, 13, 15, 15, 16, 17, 18, 19
Mean=

$\frac{12+12+13+13+15+15+16+17+18+19}{10}$

$= \frac{150}{10} = 15$

Sol.76.(d) The most frequent number is called mode
In this frequency distribution chart
Mode = 40, which have most frequency i.e 7 .

Sol.77.(b) On arranging the data in ascending order,
2, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 24,

Median (x)= $\frac{13+14}{2}$ = 13.5

If 2 and 8 are replaced by 21 and 18 then,
Data = 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 18, 20, 21, 24,

Median (y)= $\frac{15+16}{2}$ = 15.5

(3x − y) = 3 × 13.5 - 15.5 = 25

Sol.78.(a)
Formula → Mode = 3Median − 2 Mean
8 = 3Median − 2 × 5

Median = $\frac{8+10}{3}$ = 6

Sol.79.(c)

Age in years	No. of patience (Frequency)	Cumulative Frequency (C.F)
0 - 10	5	5
10 - 20	x	5 + x
20 - 30	20	25 + x
30 - 40	15	40 + x
40 - 50	y	40 + x + y
50 - 60	5	45 + x + y
Total	60	160 + 5x + 2y

Formula for finding median of grouped data :- l + $\frac{\frac{N}{2} - CF}{f}$ × h

Where, l = lower limit of the median class
N = number of observations
f = frequency of median class
h = class size
cf = cumulative frequency of class preceding the median class

Here, N = 60 so $\frac{N}{2}$ = 30

Thus, the observations lie between the class interval 20-30, which is called the median class.
Therefore,
l = 20 , h = 10 , f = 20 and cf = 5+x

Median = l + $\frac{\left(\frac{N}{2} - cf\right)}{f}$ × h

By putting all the values in the above formula we get,

Median = 20 + $\frac{30-(5+x)}{20}$ × 10

From question Given Median = 28.5

So, 28.5 = 20 + $\frac{30-(5+x)}{20}$ × 10

⇒ 40 + 30 - 5 - x = 57
⇒ 70 - 5 - x = 57 ⇒ x = 8
And given total frequency is 60 and we know that the total frequency is the sum of all frequency hence
5 + x + 20 + 15 + y + 5 = 60
5 + 8 + 20 + 15 + y + 5 = 60
(putting x = 8)
53 + y = 60 So y = 7
Hence, x = 8 and y = 7

Sol.80.(d)

Arithmetic mean ⇒ $\frac{3k+7k-14}{2k-2}$ = 4

10k - 14 = 8k - 8
2k = 6 ⇒ k = 3

Sol.81.(c)
16, 17, 15, 17, 16, 15, 14, 14, 13, 17, 13, 12, 12, 16, 10, 14, 17, 10, 11.
On arranging the numbers,
10, 10, 11, 12, 12, 13, 13, 14, 14, 14, 15, 15, 16, 16, 16, 17, 17, 17, 17,
So, mode = 17

Sol.82.(d)
Mean of the given data ⇒ 29 , 36 , 21 , 18 , 7 , 19 , k , k = 21.25
29 + 36 + 21 + 18 + 7 + 19 + k + k = 21.25 × 8 = 170
2k = 40 ⇒ k = 20
Mode of the given data ⇒ 29 , 22 , 15 , 15 , 22 , 18 , 21 , p , p = 29
Value of p = 29
Now ⇒ (p - k) = 29 - 20 = 9

Sol.83.(a) The mean remains unaltered only if the observations having mean equal to original mean is removed.
Clearly, here 12 is removed.

Sol.84.(b) On arranging the given numbers in ascending order we get, $\frac{a}{4}$, $\frac{a}{2}$, $\frac{3a}{5}$, $\frac{2a}{3}$, a ,Here n = 5, (odd)

So, median = $\frac{n+1}{2}$ th term.

Median = $\frac{5+1}{2}$ th term = 3rd term = $\frac{3a}{5}$

$\frac{3a}{5}$ = 6, a = 10.

Sol.85.(c) 3 median = mode + 2 mean
3 median = 27.5 + 2 × 28.5

Median = $\frac{27.5+57}{3} = \frac{84.5}{3}$

$= 28.166 = 28.17$

Sol.86.(b) On arranging lowest to highest,
2.1, 5, 6, 7, 8, 9.3, 10, 11, 14, 15, 16.5, 17, 19.21, 27, 31, 31, 33
Mode = 31 (Most repeated)
Median = 14 , Difference = 31 - 14 = 17

Sol.87.(d) Short trick:-

Arithmetic mean = [142.5 + {$\frac{130.5}{90}$}]

= 143.95

Sol.88.(c) As per question,
12n - 8n = 208 - 92 = 116
4n = 116 , n = 29
Sum = x - (8 × 29) = 208 , x = 440

Mean of n values = $\frac{440}{29}$ = 15.2

Sol.89.(d) Mean = $\frac{(3 \times median - mode)}{2}$

Mean = $\frac{(3 \times 9 - 13)}{2}$, Mean = 7

Mean : Mode = 7 : 13

Sol.90.(a) On arranging,

1, 2, 4, 5, 7, 8 , Median = $\frac{4+5}{2}$ = 4.5

Sol.91.(d) $f(x) = 1 + x + x(x-1) + \frac{1}{2}x(x-1)(x-2) - \frac{1}{3}x(x-1)(x-2)(x-3)$

Mode is the value at which $f(x)$ is maximum.
At x = 0 → $f(x) = 1$
At x = 1 → $f(x) = 2$
At x = 2 → $f(x) = 5$
At x = 3 → $f(x) = 13$
At x = 4 → $f(x) = 21$
For x = 4 , f(x) is maximum, So Mode of x= 4

Sol.92.(c) Option (c) 53, 55, 57, 58
Median = (55 + 57)/2 = 56

Sol.93.(c) Mean - Mode = 69 (given)
Mode = Mean - 69
Now, Mode = 3 Median - 2 Mean

Mean - 69 = 3 Median - 2 Mean
3 Mean - 3 median = 69
Mean - Median = $\frac{69}{3} = 23$

Sol.94.(a) $\frac{33+x+47+83+109}{5} = 67$
$x = 335 - 272 = 63$
Now, Mean = $\frac{50+64+100+126+63}{5}$
$= \frac{403}{5} = 80.6$

Sol.95.(d) Arranging in ascending order;
9 ,16 , 21 , 26 , 29 , 31 , 41 , 46 , 51 , 54 , 56 , 61 , 62 , 65 , 71 , 73 , 78 , 86 , 89 , 91.
median(x) = $\frac{54+56}{2} = 55$
Now, after replacing two number;
9 , 16 , 21 , 29 , 31 , 46 , 51 , 54 , 56 , 59 , 61 , 62 , 65 , 71 , 73 , 75 , 78 , 86 , 89 , 91.
Median (y) = $\frac{59+61}{2} = 60$
therefore, 3 x - 2 y = 55 × 3 - 2 × 60
= 165 - 120 = 45

Sol.96.(b) New mean = $\frac{14+22+16+24+12+8+4+18+12+10+(10\times10)}{10}$
$= \frac{140+100}{10} = \frac{240}{10} = 24$

Sol.97.(c)
Sum of last 11 numbers = 11 × 9 = 99
Sum of 12 numbers = 12 × 11 = 132
First number = 132 - 99 = 33
Now , $\frac{Second\ number}{First\ number} = \frac{5}{3}$
Second number = $\frac{5}{3} \times 33 = 55$

Sol.98.(c)
Upper limit = $\frac{79+80}{2} = \frac{159}{2} = 79.5$

Sol.99.(b) $\frac{14+6+2a+16}{4} = 12$
$\Rightarrow 2a + 36 = 48 \Rightarrow 2a = 48 - 36$
$\Rightarrow 2a = 12 \Rightarrow 6$

Sol.100.(b) Prime numbers between 20 and 62 = 23, 29, 31, 37, 41, 43, 47, 53, 59, 61
Median of 10 numbers=$Average\ of$ $(\frac{n}{2})^{th} and\ (\frac{n}{2}+1)^{th} = \frac{41+43}{2} = 42$

Sol.101.(b) 98, 108, 122, 134, 156, 194
Range = 194 - 98 = 96
Median = $\frac{122+134}{2} = 128$
$\frac{Range}{Median} = \frac{96}{128} = \frac{3}{4}$

Sol.102.(c) Mean = $\frac{1+4+7+12+13+10+11+18+37+33+29+27+16+25+28+17+19}{19}$
$= \frac{307}{19} = 16.16$
By arranging in ascending order; 0, 0, 1, 4, 7, 10, 11, 12, 13, 16, 17, 18, 19, 25, 27, 28, 29, 33, 37
Median of odd term = $(\frac{n+1}{2})^{th}$ = $(10)^{th}$
= 16 , Mode = 0

Sol.103.(b) Arranging in ascending order,
6 , 8 , 27 , 50 , 63 , 65 , 81 , 122 , 165 , 180
Median = $(\frac{63+65}{2})$ = 64

Sol.104.(c) 4 , 6 , 10 , x , 20 , 24 , 32
Mean = Median
$\frac{4+6+10+x+20+24+32}{7} = x$
$7x - x = 96 \Rightarrow 6x = 96 \Rightarrow x = 16$

Sol.105.(b) In general, the most appropriate average value in measuring central tendency is the mean. Central tendency is a descriptive summary of a dataset through a single value that reflects the centre of the data distribution. Along with the variability of the dataset, the central tendency is a branch of descriptive statistics.

Sol.106.(a) To find the median we have to arrange it in ascending order,
7, 9, 12, 12, 12, 13, 13, 14, 14, 14, 14, 15, 16, 17, 18, 18, 18,19, 20, 20.
Median = 14 ; also Mode = 14 ;
So, (2 × median - mode) = (2 × 14 - 14) = 14

Sol.107.(d) As we know the relationship between Mean, Median and Mode is,
3 Median – 2 Mean = Mode
So, if we consider Mean = 4 units, Median = 5 units
then Mode = 7 units
So, ratio of its mean and mode = 4 : 7

Sol.108.(a) Correction of the mean value due to wrong entry
= ± {(difference between right and wrong value entered) / n}
Here difference between right entry and wrong entry = (83 +76) - (38 + 46) = 75
So correction of the mean value will be = $\frac{75}{150}$ = 0.5
[As the value of wrong entry is greater than right entry, we have to deduce 0.5 from the given mean value.]
i.e. the correct mean = (45 - 0.5) = 44.5

Sol.109.(d) Marks obtained are:- 43, 44, 65, 41, 53, 65 and 62.
Here we observe that 65 marks obtained by two students therefore the mode of the given data will be = 65

Sol.110.(b) The sum of the deviations about the mean is always zero i.e. the sum of deviations below the mean will always be equal to the sum of deviations above the mean.

Sol.111.(b) We know,
$Lower\ limit = Mid\ value - \frac{width}{2}$
So, the lower limit of the class is
$= (12 - \frac{6}{2}) = 9$

Sol.112.(b) Class mark = (Lower class limit + Upper class limit)/ 2
⇒ {(90 + 120) ÷ 2} + {(120 + 150) ÷ 2}
= 105 + 135 = 240

Sol.113.(a) Coefficient of Variation
= $\frac{5}{25} \times 100$ = 20%

Sol.114.(c) Sum of a, b, c, d, e and f = 36 × 6 = 216
Sum of b, d and f = 28 × 3 = 84
Sum of a, c and e = 216 - 84 = 132
∴ Mean of a, c and e = $\frac{132}{3}$ = 44

Sol.115.(a) =The weight of the heaviest student is 59 kg.

Sol.116.(c) The most commonly observed weight is 53 kg.

Sol.117.(a) The weight (in kg) that appears the least number of times in the given data is 50 kg.

Sol.118.(c) The range of the given data is (Max weight - Min weight) = (59 - 50) = 9

Sol.119.(a) As the mean of the data set 11, 19, 5,10, k, 13,12, 8, 15,14 is 11,
So, we can write :
$\Rightarrow \frac{107+k}{10} = 11$
$\Rightarrow k = 110 - 107 = 3$

Sol.120.(a)

x	f	fx
5	2	10
8	5	40
10	8	80
12	22	264
p	7	7p
20	4	80
25	2	50

∑f =50 ∑fx = 524 + 7p
Mean = $\frac{524+7p}{50}$
$\Rightarrow \frac{524+7p}{50} = 12.58$
$\Rightarrow 524 + 7p = 629 \Rightarrow 7p = 105$
$\Rightarrow p = 15$

Sol.121.(a) The given no. of terms in the sequence is even terms.
Then Median (for n = even)
$= \frac{[\frac{n}{2}th + (\frac{n}{2}+1)th]}{2}$
Here, no. of terms is 8
So, Median = $\frac{4th + 5th}{2}$
Median of given data = $\frac{(x+4)+(x+8)}{2}$
= x + 6 = 19 ⇒ x = 19 - 6 = 13

Sol.122.(d) Sum of x observations = mx
If 0 and m is added , New Sum = mx + m = m(x + 1)
No. of observations = x + 2
Mean = $\frac{m(x+1)}{x+2}$

Sol.123.(b)

x	f	fx
5	6	30
10	k	10k
15	6	90
20	10	200
25	5	125

∑f = 27 + k ∑fx = 445 + 10k
A/Q,
Mean = $\frac{445+10k}{27+k} = 15$
$\Rightarrow 445 + 10k = 405 + 15k$
$\Rightarrow 40 = 5k \Rightarrow k = 8$

Sol.124.(b)

Age in years (x)	15	16	17	18	19	20
No. of students	3	8	10	10	5	4

From the given data :
The mean age of the students =
$\frac{15\times3+16\times8+17\times10+18\times10+19\times5+20\times4}{40}$
$= \frac{698}{40} \simeq 17.45$

Sol.125.(c)

x	f	fx
3	6	18
5	8	40
7	15	105
9	p	9p
11	8	88
13	4	52

∑f = 41 + p ∑fx = 303+ 9p
Mean = $\frac{303+9p}{41+p} = 8$
⇒ 303 + 9p = 328 + 8p ⇒ p = 25

Sol.126.(d)

x	f	fx
19	13	247
21	15	315
23	16	368
25	18	450
27	16	432
29	15	435
31	13	403

∑f = 106 ∑fx = 2650
Mean = $\frac{2650}{106}$ = 25

Sol.127.(b) (4 students marks who failed) , 52 , 55, 66, 80, 81
The given number of terms is 9 which is odd term.
For n= odd terms, we have
Median=[((n + 1)/2)th]term
So, Median = 52%

Sol.128.(b)
The given data is in ascending order,
7, 11, 12, (x - y), (x + y), 20, 21, 29
Since the total number of terms is even.
So, Median = (Sum of two middle number) ÷ 2
16 = (x + y + x - y) ÷ 2 ⇒ x = 16

Sol.129.(d) Arranging the data in ascending order, we get
3, 4, 4, 5, 6, 7, 7, 7, 12
Here, n = 9
Median = middle term (when the number of observations is an odd number)
= 5th observation = 6.

Sol.130.(a) 18, 20, 16, 17, 32, 17, 6, 16, 12, 13, 17, 28, 24, 45, 17
Arrange in ascending order,
6,12,13,16,16,17,17,17,17,18,20,24,28,32, 45
Median = $\frac{17+17}{2}$ = 17
Mode = 17
the average of the mode and median =
(Mode + Median) ÷ 2 = $\frac{17+17}{2}$ = 17

Sol.131.(b) As we know :
Mode = 3 × Median - 2 × Mean
So, from the expression : mean = (3 median - mode)/p
We get P = (3 median - mode) / mean = 2
So, p = 2

Sol.132.(a) 13, 14, 14, 15, 16, 17, 17, 17, 22
We observe that the middle number = 16
Median = 16

Sol.133.(c) S = {1, 2, 2, 3, 3, 3, 4, 4, 4, 4}
Mean =
$\frac{1+2+2+3+3+3+4+4+4+4}{10}$
$= \frac{30}{10} = 3$
Mode = 4
Median = $\frac{3+3}{2} = 3$
Now, 4 × mean + 2 × mode - 8 × median
= 4 × 3 + 2 × 4 − 8 × 3
= 12 + 8 - 24 = 20 - 24 = - 4

Sol.134.(a)
Firstly arranging in ascending order
20 ,30 ,40, 50, 50 ,70, 80 ,90
Median = $\frac{50+50}{2}$ = 50
20 ,40 , 50, 50 ,70,80 ,90,120
New, Median = $\frac{120}{2}$ = 60
The mean of the two medians
= $\frac{50+60}{2}$ = 55

Sol.135.(d)
Firstly arrange in ascending order → 10,12,14,16,18, 20, 26, 28
Mean →
$\frac{10+12+14+16+18+20+26+28}{8}$
= $\frac{144}{8}$ = 18
Median → $\frac{16+18}{2}$ = 17
Now , sum of the mean and median = 18 + 17 = 35

Sol.136.(b) Mean = Sum of observations ÷ Number of observations
6 = $(\frac{x}{2} + x + \frac{x}{3} + \frac{x}{4} + \frac{x}{6})$ /5
6 = (2.25x) / 5 ⇒ 6 = 0.45x ⇒ X = $\frac{40}{3}$

Sol.137.(b)
Firstly arranging in ascending order -
10 , 20 , 30 , 40 , 50 ,60 , 70 , 80 , 90
Median = mid digit = 5th digit = 50
When , Replace 30 with 100
10 , 20, 40 , 50, 60, 70 ,80, 90, 100
Median = mid digit = 5th digit = 60
Hence , difference there median = 60 - 50 = 10

Sol.138.(d) Mean
= $\frac{(3\times120)+(4\times130)+(5\times140)}{20}$
= $\frac{+(6\times150)+(160\times2)}{20}$
Mean = $\frac{360+520+700+900+320}{20}$
Mean = $\frac{2800}{20} = 140$

Sol.139.(a)

x	f	fx
3	k	3k
2	2k	4k
k	3k	$3K^2$
4	4k	16k
5	5k	25k

$\Sigma f = 15k, \Sigma fx = 48k + 3k^2$

Mean = $\frac{\Sigma fx}{\Sigma f} \Rightarrow k = \frac{48k + 3k^2}{15k}$

$15k^2 - 3k^2 = 48k \rightarrow K = 4$

Sol.140.(a) Sum of first 15 natural numbers = $\frac{15 \times 16}{2} = 120$

Arithmetic mean = $\frac{120}{15} = 8$

Sol.141.(d) Given data = 9, 15, 20, 25, 25, 25, 35

Mean = $\frac{9 + 15 + 20 + 25 + 25 + 25 + 35}{7}$

$= \frac{154}{7} = 22$

Median = 25 , Mode = 25

Sum = 22 + 25 + 25= 72

Sol.142.(d)

8,10,12,15, x, x+ 2, 20, 25, 30, 32

Median = $\frac{x + x + 2}{2} = 17$

$\Rightarrow \frac{2(x+1)}{2} = 17 \Rightarrow x + 1 = 17$

$\Rightarrow x = 16$

Sol.143.(c) b = a + 18 (median)

A/Q,

a + b + c = 105

⇒ a + (a + 18) + c = 105

⇒ 2a + 18 + c = 105 ⇒ c = 87 - 2a

b ≤ c

a + 18 ≤ 87 -2a

3a ≤ 69 ⇒ a = 23

b = 23 + 18 = 41

therefore 23+41 + c = 105 ⇒ c= 41

Sol.144.(d)

Sum = $1^2 + 2^2 + 3^2 + \ldots\ldots\ldots + n^2$

$= \frac{n(n+1)(2n+1)}{6}$

Sum of frequencies = $\frac{n(n+1)}{2}$

Mean = $\frac{n(n+1)(2n+1)}{6} \times \frac{2}{n(n+1)}$

$= \frac{2n+1}{3}$

Sol.145.(d)

Firstly arrange in ascending order ---

1 2 2 3 3 3 4 4 5 5 6 6 8

Where ,

mean = $\frac{52}{13}$ = 4 , mode = 3 ,

median = 7th digit = 4

Option (d) is incorrect.

Sol.146.(a) $\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$

$\sum x_i = n\bar{x} = 100 \times 40 = 4000$

$\sigma_x^2 = \frac{1}{n}\sum_{i=1}^{n} x_i^2 - (\bar{x})^2 = 100(26.01 + 1600)$

= 162601

Corrected $\sum x_i$ = 4000 - 50 + 40 = 3990

Corrected $\sum x_i^2$ = 16201-$(50)^2$ + $(40)^2$

= 161701

So corrected mean = $\frac{3990}{100}$ = 39.9

Corrected $\sigma_x^2 = \frac{161701}{100} - (39.9)^2 = 25$

Corrected standard deviation = 5

Sol.147.(b) Sum of marks of all 4 quizzes = $95 \times 4 = 380$

Mean of 5 quizzes = $\frac{380 + 0}{5} = 76$

Sol.148.(c) Mean of the given data

= $\frac{23.5 + 15 + 20 + 22 + 16}{5}$ = 19.3 kg

Sol.149.(c) Mean of a and b = 350 and let the ratio of a and b = 2x : 5x

$\frac{2X + 5X}{2}$ = 350 ⇒ 2X + 5X = 700

⇒ 7X = 700 ⇒ X = 100

So that , a = 200 , b = 500

For , b - a = 300

Sol.150.(c)

Sum of 6 numbers = $6 \times 18 = 108$

Sum of 7 numbers when 1 number is included = $7 \times 20 = 140$

Included Number = 140 - 108 = 32

Sol.151.(c) Total number of observation = 10 , Mean = 10 , median = 9

When , same number (1) , subtract from each observation

Mean = 10 - 1 = 9 and median = 9 -1 =8

Sol.152.(d) Relationship between mean , median and mode.

Mode = 3 median - 2 mean

Median = $\frac{mode + 2\,mean}{3}$

= $\frac{7.52 + 2 \times 9.83}{3}$ = 9.06

Sol.153.(a) Mean of three numbers is 32 so their sum is 3 × 32 = 96

Now let three numbers (x, x + 8 and x + 28), as in question it is given that its range is 28 its means the difference between maximum and minimum is 28 and , so if smallest is x then largest number is x+28 and second number is 8 greater than smallest so it is x + 8

Now , x + (x + 8) + (x + 28) = 96

So , x = 20

Now largest number is x + 28

So, 20 + 28 = 48

Sol.154.(a) (a + b + c) = $3 \times 28 = 84$

Median of a, b, and c = b

b = a + 16 __ (1)

Now,

a + a + 16 + c = 84

$\Rightarrow 2a + c = 68 \Rightarrow$ c = 68 - 2a

Now, b ≤ c

$a + 16 \leq 68 - 2a$

$\Rightarrow 3a \leq 52 \Rightarrow a \leq 17$

From equation (1)

b = 17 + 16 = 33

We have, a + b + c = 84

$\Rightarrow 17 + 33 + c = 84$

$\Rightarrow c = 84 - 50 = 34$

Sol.155.(a)

Given data : 2, 3, 5, 7, 2, 3, 3, 5, 7, and 9.

2, 2, 3, 3, 3, 5, 5, 7, 7, 9

Median = $\frac{3 + 5}{2} = 4$, Mode = 3

Sol.156.(c) Total numbers = 7

Median will be middle number = 4th number , After the median 3 largest numbers come so by increasing those numbers there will be no effect on median.

Sol.157.(a) Mean of 7 observations = 10

Sum = $7 \times 10 = 70$

Mean of 3 observations = 5

Sum = $3 \times 5 = 15$

Mean of all observation together = $\frac{70 + 15}{10} = 8.5$

Sol.158.(c)

Given , Mode = 12.5 , mean = 15.2

The relation between mode , median and mean is

Mode = 3 median - 2 mean

Now , 12.5 = 3 × median - 2 × 15.2

Median = 14.3

Sol.159.(c) 3 Median = 2 mean + mode

$\Rightarrow 3\,Median = 2 \times 34.2 + 31.5$

$\Rightarrow 3\,Median = 68.4 + 31.5$

$\Rightarrow 3Median = 99.9 \Rightarrow Median = 33.3$

Sol.160.(c) Total marks of 50 students = 50 × 40 = 2000

Error = 43 - 23 = 20

Correct marks = 2020

Correct mean = $\frac{2020}{50}$ = 40.4

Sol.161.(b) Variance = $\frac{\Sigma (X - x)^2}{N}$

Where , n = numbers of variance ,

x = mean , X = Given terms

Mean = $\frac{3 + 6 + 5 + 2 + 4}{5}$ = 4

Variance =

$\frac{(4-3)^2+(4-6)^2+(4-5)^2+(4-2)^2+(4-4)^2}{5}$

= 2

Sol.162.(c) Five observations x, x - 1, x - 2, x - 3 and x - 4

Mean = $\frac{x+x-1+x-2+x-3+x-4}{5}$

$= \frac{5x-10}{5} = x - 2$

A/Q,

x - 2 = 20 ⇒ x = 22

1st observation = 22

2nd observation = 22 - 1 = 21

Mean of first two observations =

$\frac{22+21}{2} = 21.5$

Sol.163.(a) first ten odd natural numbers = 1 , 3 , 5 , 7 , 9 , 11 , 13 , 15 ,17 , 19

Mean of first ten odd natural numbers = $\frac{5th+6th}{2} = \frac{9+11}{2}$ = 10

Sol.164.(a) Mean = $\frac{sum\ of\ the\ digits}{numbers\ of\ the\ digit}$

$=\frac{36+53+50+43+57+50+40+35+39+34}{10}$

$= \frac{437}{10}$ = 43.7

Sol.165.(a)

Sum of the digit = 11 × 44 = 484

Sum of the first six digit = 6 × 39 = 234

Sum of the last six digit = 6 × 48 = 288

6th digit = (234 + 288) - 484 = 38

Sol.166.(c) Firstly arranging in ascending order - 7 , 8 , 11 , 12 , 13 , 14 , 15 , 20

Median = $\frac{mid\ digit\ in\ the\ given\ sequence}{number\ of\ digit}$

$= \frac{4th+5th}{2} = \frac{12+13}{2}$ = 12.5

Sol.167.(d) Sum of Total observation = 20 × 50 = 1000

Difference = (13 - 31) + (24 - 42)

= -18 - 18 = - 36

New sum = 1000 + (- 36) = 964

New mean = $\frac{964}{20}$ = 48.2

Hence , correct mean = 48.2

Sol.168.(b) Firstly arranging in ascending 16 , 27 , 32 , 35 , 45 , 58 , 64 , 76

Median = $\frac{35+45}{2}$ = 40

Sol.169.(c) Mean

$= \frac{8+(-2)+9+6+13+17+12}{7} = \frac{63}{7} = 9$

Sol.170.(c) A frequency polygon is drawn using the midpoint of classes and frequencies.A frequency polygon is a visual representation of a distribution. The visualization tool is used to understand the shape of a distribution

Sol.171.(c) Mid value = 35

Lower boundary = 30

Difference between mid and lower boundary value = 5

So that , upper boundary value = 35 + 5 = 40

Sol.172.(b) Let the mean = x

Mode = x + 9

Mode = 3 median -2 mean

$\Rightarrow x + 9 = 3\ median - 2x$

$\Rightarrow 3\ median = 3x + 9$

Median = x + 3

Difference between mode and median = x + 9 - (x + 3) = 6

Sol.173.(a)

Observation - 2 , 4 , 8 , 7 and 5

Arithmetic mean =

$\frac{2\times5+4\times3+8\times2+7\times6+5\times4}{5+3+2+6+4}$

$= \frac{100}{20}$ = 5

Sol.174.(d) 4, 7, 9, 10, 15

Mean $(x) = \frac{4+7+9+10+15}{5} = 9$

No. of terms = n = 5

SD = $\sqrt{\frac{\sum(X-x)^2}{n}}$

$= \sqrt{\frac{5^2+2^2+0+1^2+6^2}{5}}$

$= \sqrt{\frac{66}{5}} = \sqrt{13.2} = 3.633$

Sol.175.(c) 3,4,5,6,7

Mean $(x) = \frac{3+4+5+6+7}{5} = 5$

Total number of terms = n = 5

SD = $\sqrt{\frac{\sum(X-x)^2}{n}}$

$= \sqrt{\frac{2^2+1^2+0+1^2+2^2}{5}} = \sqrt{\frac{10}{5}} = \sqrt{2}$

Sol.176.(b)

Sum of 5 observations = $5 \times 20 = 100$

If one observation is added

New mean = 22

Sum of all 6 observation = $6\times 22 = 132$

6th observation = 132 - 100 = 32

Sol.177.(a) 3 Median = Mode + 2 Mean

$\Rightarrow 3Median = 25.2 + 2 \times 27.5 = 80.2$

Median = $\frac{80.2}{3} = 26.73$

Sol.178.(d) Mean ,

$= \frac{5+7+9+\alpha+11+12}{6} = \frac{44+\alpha}{6}$

A/Q,

$\frac{44+\alpha}{6} = 9 \Rightarrow 44 + \alpha = 54 \Rightarrow \alpha = 10$

Sol.179.(d) 6, 7,10,12,13, 8, 14

Mean $(x) = \frac{6+7+10+12+13+8+14}{7}$

$= \frac{70}{7} = 10$

Variance = $\frac{\sum(X-x)^2}{n}$

$= \frac{4^2+3^2+0^2+2^2+3^2+2^2+4^2}{7}$

$= \frac{16+9+0+4+9+4+16}{7} = \frac{58}{7}$ =8. 29

Sol.180.(d) First arrange in ascending order - 2 , 3, 4, 5, 5, 8, 8

Median = 5(middle term)

Mean = $\frac{sum\ of\ the\ given\ sequence}{no\ of\ terms}$

$= \frac{35}{7}$ = 5

difference between the mean and the median = 5 - 5 = 0

Sol.181.(c) Arrange the given sequence - 2 , 14 , 16 , 18 , 20 , 20 , 28 , 30 , 32 , 48

Median = $\frac{5^{th}\ term + 6^{th}\ term}{2}$

$= \frac{20+20}{2}$ = 20

Sol.182.(b) Given data is 25,18,20,16,8,10,15,20,13,30

= 8, 10, 13, 15, 16, 18, 20, ,20, 25, 30

Median = $\frac{16+18}{2} = 17$

Sol.183.(a) 29,32,48,50,x,x + 2,72,78,84,95

Median = $\frac{x+x+2}{2} = \frac{2x+2}{2} = x + 1$

A/Q,

$x + 1 = 63 \Rightarrow x = 62$

Sol.184.(b) k - $\frac{3}{2}$, k + 2, k - 1, k + 4, k + $\frac{1}{2}$, k - 3, k + $4\frac{1}{2}$

Let , k = 1

1 - $\frac{3}{2}$, 1 + 2, 1 - 1, 1 + 4, 1 + $\frac{1}{2}$, 1 - 3,

1 + $4\frac{1}{2}$

- $\frac{1}{2}$, 3 , 0 , 5 , $\frac{3}{2}$, -2 , $\frac{11}{2}$

Now , arranging in ascending order

-2 , -$\frac{1}{2}$, 0 , $\frac{3}{2}$, 3 , 5 , 5.5

Hence , median = $\frac{3}{2}$= k + $\frac{1}{2}$

Sol.185.(c) Firstly , arrange the given sequence on ascending order

8 , 10 , 12 , 12 , 12 , 18

Mean = sum of the sequence numbers / total number of of the sequence
= 72 / 6 = 12
Mode = The mode is the value that occurs most often. = 12

Median = $\frac{3rd\ term + 4th\ term}{2}$

= $\frac{12+12}{2}$ = 12

Hence , sum of the mean, median and mode = 12 + 12 + 12 = 36

Sol.186.(a) 1st case -
8 , 15 , 18 , 22 , 26 , 32

Median = $\frac{18+22}{2}$ = 20

2nd case -
8 , 15 , 18 , 26 , 32 , 52

Median = $\frac{18+26}{2}$= 22

Difference between two medians = 22 - 20 = 2

Sol.187.(b) 3 , 4 , 8 , x , x + 1 , 12 ,14,15

Median = $\frac{x+x+1}{2} = \frac{2x+1}{2}$

A/Q,

$\Rightarrow \frac{2x+1}{2} = 9.5 \Rightarrow 2x + 1 = 19$

$\Rightarrow 2x = 18 \Rightarrow x = 9$

Sol.188.(a)3, 5, 6, 2p + 3, 3p + 2, 15, 25, 51.
Median of the given data = 10

$\Rightarrow \frac{2p+3+3p+2}{2} = 10$

$\Rightarrow \frac{5p+5}{2} = 10 \Rightarrow 5(p+1) = 20$

$\Rightarrow p + 1 = 4 \Rightarrow p = 3$

Sol.189.(d) The histogram is a popular graphing tool. It is used to summarize discrete or continuous data that are measured on an interval scale. First described by Karl Pearson.

Sol.190.(b)2,5,15,25,20,12,8,7,6,16,21,17, 30,32,23,40,51,15,2,9,57,19,25.
The numbers lies between 20 - 25 = (20, 21, 23)

The frequency of class 20 - 25 = 3

Sol.191.(a) 2 , 2 , 3 , 5 , 5 , 5 , 6 , 8 , 9
Median of the given data = 5
Mode = 5

Sol.192.(c) x : y = 3 : 7

Mean = $\frac{3+7}{2} = 5$

A/Q, 5 unit = 400
y - x = 7 - 3 = 4 unit

4 unit = $\frac{400}{5} \times 4 = 320$

Sol.193.(c)
Increasing order of the given data is
22, 34, 39, 45, 54, 54, 56, 68, 78, 84
Median = 54

Sol.194.(d)
Mean of the given data

= $\frac{x+77+x+7+x+5+x+3+x-2}{5}$

= $\frac{5x+90}{5} = x + 18$

Sol.195.(c) Given,
standard deviation = 3 and
Arithmetic mean = 6
Using this formula -

coefficient of variation = $\frac{standard\ deviation}{Arithmetic\ mean} \times 100$

with the help of this formula

coefficient of variation = $\frac{3}{6} \times 100 = 50$

Sol.196.(c)

Class	Mid-point(x)	Frequency(f)	f× x
0 - 10	5	8	40
10 - 20	15	10	150
20 - 30	25	k	25k
30 - 40	35	6	210
40 - 50	45	12	540
		∑f = 36+k	∑fx = 940 + 25k

Mean = $\frac{940+25k}{36+k} = 26$

$\Rightarrow 940 + 25k = 936 + 26k \Rightarrow k = 4$

Sol.197.(d) 2 , 4 , 5 , 8 , 2 and 3

Mean = m = $\frac{2+4+5+8+2+3}{6} = 4$

The numbers 4, 3, 3, 5, m, 3 and p have mean m + 1

$\Rightarrow \frac{4+3+3+5+4+3+p}{7} = 5$

$\Rightarrow 22 + p = 35 \Rightarrow p = 13$

Mode = r = 3

Increasing order = 3, 3, 3, 4, 4, 5, 13

Median = q = 4

p + q + r = 13 + 4 - 3 = 14

Sol.198.(a) We have
Observations = $x_1, x_2, x_3, \ldots, x_n$
mean of observations = $\bar{x}$

$\bar{x} = \frac{x_1+x_2+x_3,\ldots+x_n}{n}$

$\Rightarrow (n\bar{x}) = x_1 + x_2 + x_3,\ldots + x_n$ ....e.q(1)
and ,

$\sum_{i=1}^{n} X_i = x_1 + x_2 + x_3,\ldots + x_n$ .....e.q(2)
ATQ

$\sum_{i=1}^{n}(X_i - \bar{x}) = \sum_{i=1}^{n} X_i - \sum_{i=1}^{n} \bar{x} = \sum_{i=1}^{n} X_i - n\bar{x}$

$\Rightarrow (x_1 + x_2 + x_3,\ldots + x_n) - (x_1 + x_2 + x_3,\ldots + x_n) = 0$

Sol.199.(d) Observation = x + 1, x + 3, x + 5, x + 7 and x + 9 and mean = 6
Then , mean =

$= \frac{(x+1)+(x+3)+(x+5)+(x+7)+(x+9)}{5}$

6 = $\frac{(5x+25)}{5}$

30 = 5x + 25 ⇒ 5 x = 5 ⇒ x= 1

Sol.200.(d)

Value (x)	Frequency (f)
29	4
30	3
30 + k	3k
34	2
62	1

From the above data set the arithmetic mean : ⇒

$\frac{29\times4 + 30\times3 + (30+k)\times3k + 34\times2 + 62\times1}{4+3+3k+2+1}$

$= 33$

$\Rightarrow k^2 - 3k + 2 = 0$

Solving the above quadratic equation we get the values of k = 2, 1 ;

So, the product of the possible values of K from the distribution = 2× 1 =2 ;

Sol.201.(d) ${}^{n}C_3 = {}^{n}C_8$,
n = 3 + 8 = 11

Sol.202.(c) Ascending order of the given values are → (a − 3.5), (a − 3),(a − 2.5), (a − 2),(a − 0.5),(a + 0.5), (a + 4) and (a + 5) Total no. of term = 8 ,

So median = $\frac{4th\ term + 5th\ term}{2}$

Median → $\frac{(a-2)+(a-0.5)}{2}$

= $\frac{2(a-1.25)}{2} = (a - 1.25)$

Sol.203.(b) Here , total no. of terms = 10 (even) So , middle term

= $\left\{\frac{n}{2}\ and\ \left(\frac{n}{2}+1\right)\right\}$

Now , median = $\frac{5th+6th}{2}$

⇒ $\frac{(2x-13)+(x+1)}{2} = 24 \Rightarrow x = 20$

Sol.204.(a) Standard deviation of the first 'n' natural number $\sigma = \sqrt{\frac{n^2-1}{12}}$

Sol.205.(b)

Mean $(\bar{x})$ = $\frac{upper\ limit + lower\ limit}{2}$

Range = upper limit − lower limit

According to the Question ,
upper limit + lower limit = 40 …… e.q .(1)
upper limit – lower limit = 5 …… e.q .(2)
On solving e.q .(1) and e.q .(2) , we get
upper limit = $\frac{40+5}{2}$ = 22.5 and lower limit = 17.5

Sol.206.(b) mean
= $\frac{x+x+3+x+5+x+7+x+10}{5}$ = 9
5x + 25 = 45 ⇒ x = 4
Now, mean of the first 3 observations
→ $\frac{4+7+9}{3}$ = $\frac{20}{3}$ = 6.66

Sol.207(c) Mean (10)
= $\frac{1+4+9+x+12+14+15+16}{8}$
$71 + x = 80 \Rightarrow x = 9$
Given series → 1, 4, 9, 9, 12, 14, 15 and 16.
Mode (most occurring terms) = 9

Sol.208.(c)
1 , 2 , 3 , 4 , 5 , ……100
Mean = $\frac{1+2+3+4 \ldots\ldots 100}{100}$
$= \frac{100 \times 101}{2 \times 100} = 50.5$

Sol.209.(b) Mean = $\frac{sum\ of\ total\ no.}{total\ \ no.\ of\ term}$
= $\frac{2+5+8+14+21}{5}$ = 10.

Sol.210.(b) Total no. of term (n) = 8
Median of 8 term = $\frac{4th\ term + 5th\ term}{2}$
Arranging the no.in ascending order → 1,4,9,9, X ,14 , 15,15
Median = $\frac{9+x}{2}$ ⇒ 11 × 2 = 9 + x ⇒ x = 13

Sol.211.(d) A.T.Q .,
$\frac{X+45+X-32+X+25+X+13+X-21}{5}$
= 12 → 5X = 30 ⇒ X → 6
Mean of the last three numbers be = $\frac{X+25+X+13+X-21}{3} \rightarrow \frac{3x+17}{3}$
⇒ 11.67

Sol.212.(a)

	Boys	:	Girls
No of students →	5	:	7
Mean height →	145 + 5	:	145

The combined mean height of 60 students = 145 + $\frac{5 \times 5}{5+7}$
= 145 + $\frac{25}{12}$ = 145 + 2.08 = 147.08 ≈ 147

Sol.213.(c)
x + y + z = 22 × 3 = 66 -------- (1)
w + x + y = 18 × 3 = 54 -------- (2)
By subtracting equ. (2) from (1)
Range of the data = z - w = 66 - 54 = 12

Sol.214.(c) Coefficient of variation of scores = $\frac{standard\ deviation}{mean}$ × 100
16 = $\frac{standard\ deviation}{25}$ × 100
Standard deviation = 4
Now, Variance = 4^2 = 16

Sol.215.(d) Let A and B be 9x and 8x
As we know,
2Mean(A) = 3Median(B) – Mode(C)
ATQ,
C = 3×8x - 2×9x
C = 24x - 18x = 6x
So, the ratio of B : C = 8x : 6x = 4 : 3

Sol.216.(d) ATQ,
$\frac{434+x}{15}$ = x ⇒ 434 + x = 15x
⇒ 14x = 434 ⇒ x = $\frac{434}{14}$ = 31

Sol.217.(d) It is given that the given sequence has odd no of terms.
Median = middle terms of the given series i.e. $ax^{\frac{n}{2}}$

Sol.218.(c)
Mean value of gain in weight = $\frac{(1.5\times4)+(2\times5)+(2.4\times8)+(3\times5)+(3.2\times2)+(3.4\times1)}{4+5+8+5+2+1}$
= $\frac{6+10+19.2+15+6.4+3.4}{25}$ = $\frac{60}{25}$ = 2.4

Sol.219.(c)
Numbers → 5 x
Average → 15 18.25
Net average = $\frac{5 \times 15 + 18.25x}{5+x}$
= $\frac{75+18.25x}{5+x}$ = 17
ATQ,
⇒ $\frac{75+18.25x}{5+x}$ = 17
⇒ 75 + 18.25x = 85 + 17x
⇒ 10 = 18.25x - 17x
⇒ 10 = 1.25x ⇒ x = $\frac{10}{1.25}$ = 8
So,
the total no of people = 5+8 = 13

Sol.220.(a) Arranging in ascending order
2, 3, 5, 6, 7, 8, 9, 9
Number of terms = 8
Median = $\frac{4th+5th}{2}$ = $\frac{6+7}{2}$ = 6.5

Coordinate Geometry

Coordinate geometry is a system of geometry where the position of points on the plane is described by using an ordered pair of numbers. The x-coordinate and the y- coordinate of a point taken together is known as coordinates of the point

Key points:

• **Coordinate Axes :** The perpendicular lines in the cartesian system are x axis and y axis . Both of them together are known as coordinate axes.

• **Origin :** The point of intersection of coordinate axes is origin. The coordinates of origin are (0 , 0).

• **Abscissa :** The x - coordinate is called abscissa. It is the perpendicular distance of a point from y axis.

• **Ordinate :** The y-coordinate is called ordinate . It is the perpendicular distance of a point from x-axis.

• If y = a, where a is constant then y = a denotes a straight line parallel to x-axis.

• If x = a, where a is constant then x = a denotes a straight line parallel to y-axis.

• For passing a line through the origin, one of the coordinates of the given equation must be (0, 0).

Important Formulae :

• Distance Formula : If points $P(x_1 , y_1)$, $Q(x_2 , y_2)$ lie on the plane xy then,

$PQ = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

• Section Formula :

The coordinates of a point which divides the line segment joined by two distinct points (x_1 , y_1) and (x_2 , y_2) in the ratio m : n are :

$(x , y) = \left(\frac{mx_2 + nx_1}{m+n} , \frac{my_2 + ny_1}{m+n}\right)$

Note : When line segment is divided externally in the ratio m : n then ratio becomes $\left(\frac{mx_2 - nx_1}{m-n} , \frac{my_2 - ny_1}{m-n}\right)$

• Midpoint Formula :

It is derived from the Section Formula.

The coordinates of a point which divides the line segments in the ratio 1 : 1. Then,

$(x , y) = \left(\frac{x_1 + x_2}{2} , \frac{y_1 + y_2}{2}\right)$

• Centroid Formula :

If (x_1 , y_1) , (x_2 , y_2) and (x_3 , y_3) are the vertices of a triangle then coordinates of the centroid are :

$\left(\frac{x_1 + x_2 + x_3}{3} , \frac{y_1 + y_2 + y_3}{3}\right)$

• Incentre Formula :

If (x_1 , y_1) , (x_2 , y_2) and (x_3 , y_3) are the vertices of a triangle then coordinates of the centroid are :

$\left(\frac{ax_1 + bx_2 + cx_3}{a+b+c} , \frac{ay_1 + by_2 + cy_3}{a+b+c}\right)$

• Slope of a line :

If (x_1 , y_1) , (x_2 , y_2) are any two points on line L, then the ratio $\frac{y_2 - y_1}{x_2 - x_1}$ is called the slope of the line L.

•Angle between two lines of slope m_1 and m_2, respectively then

$\tan\theta = \left|\frac{m_2 - m_1}{1 + m_1 m_2}\right|$

• Intercept form of equation of a line :

$\frac{x}{a} + \frac{y}{b} = 1$,where 'a' is x intercept of line l and 'b' is y intercept of line l.

• Perpendicular distance from a point (x_1, y_1) to line ax + by + c = 0, then

$D = \frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}$

• Distance between ∥ lines :

$a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ is

$D = \left|\frac{c_1 - c_2}{\sqrt{a^2 + b^2}}\right|$

• Equation of a circle

$x^2 + y^2 + 2gx + 2fy + c = 0$, where center of the circle is (- g , - f) and

radius = $\sqrt{g^2 + f^2 - c}$

• If point A (x_1 , y_1) , B(x_2 , y_2) and C (x_3 , y_3) are the vertices of a triangle then area of a triangle is :

$\frac{1}{2}\left|x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)\right|$

Variety Questions

Q.1. The area (in square units) of the quadrilateral ABCD, formed by the vertices A (0 , - 2), B (2 , 1) , C (0 , 4), and D (- 2 , 1) is
Group D 18/08/2022 (Morning)
(a) 15 (b) 14 (c) 13 (d) 12

Q.2. The graphs of the equations 2x + 3y = 4 and 3x - y + 5 = 0, intersect at P(α, β). What is the value of (3α - 4β)?
NTPC CBT II Level 2 (16/06/2022) Shift 1
(a) 2 (b) 11 (c) - 1 (d) - 11

Q.3. Find the relation between x and y such that the points (x , y) is equidistant from (6 , 2) and(4 , 6)
NTPC CBT - I 31/01/2021 (Evening)
(a) x + 2y = 3 (b) 2x - y = 3
(c) 2x + y = - 3 (d) x - 2y = - 3

Q.4. The equation of the line passing through (2 , 3) and perpendicular to the line joining (- 5, 6) and (- 6 , 5) is:
NTPC CBT - I 08/02/2021 (Evening)
(a) x + y - 5 = 0 (b) x - y - 5 = 0
(c) x + y + 5 = 0 (d) x - y + 5 = 0

Q.5. Three straight lines x + y - 3 = 0 , x + y + 2 = 0 and 3x + 3y - 7 = 0 are :
NTPC CBT - I 22/02/2021 (Morning)
(a) parallel
(b) perpendicular
(c) intersecting each other
(d) concurrent

Q.6. If the centroid of the triangle formed by the points (3 , 5) (- 7 , 4) (10 , - 6) is at the point (k , 1) then the value of k is :
NTPC CBT - I 13/03/2021 (Morning)
(a) 2 (b) 3 (c) 4 (d) 1

Q.7. Find the points of intersection of the line 4x - 3y = 10 and the circle
$x^2 + y^2 - 2x + 4y - 20 = 0$
NTPC CBT - I 26/07/2021 (Morning)
(a) (4, 2) and (- 2, - 6) (b) (-2, 3) and (4, 2)
(c) (- 2, 3) and (4, 3) (d) (2, -3) and (4, 2)

Practice Questions

RRC Group D
(17/08/2022 to 11/10/2022)

Q.8. There are four distinct points on a plane such that no three points are collinear. Find the number of distinct straight lines that can be drawn through them.
Group D 17/08/2022 (Afternoon)
(a) 8 (b) 4 (c) 2 (d) 6

Q.9. If the area of the triangle whose vertices are (3 , - 2), (2 , - 3) and (p. - 4) is 8 square units , then find the value of p.
Group D 30/08/2022 (Afternoon)
(a) - 15 (b) 17 (c) - 16 (d) 15

Q.10. The graph of $y = 9x^2 + 16$:
Group D 30/09/2022 (Morning)
(a) touches the x-axis at $\frac{4}{3}$
(b) either intersects or touches the x-axis
(c) intersects the x - axis at $-\frac{4}{3}$ and $\frac{4}{3}$
(d) neither intersects nor touches the X - axis

RRB NTPC CBT - 2
(09/05/2022 to 17/06/2022)

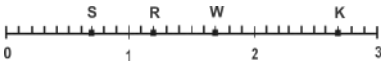
Q.11. The graphs of the equations 3x - 2y - 11 = 0 and x + y = 7 intersect at P (α, β). What is the value of (3α + 5β)?

Level 2 (13/06/2022) Shift 2
(a) 11 (b) 23 (c) 25 (d) 13

Q.12. The straight line kx – 3y = 6 passes through the point (3,2). What is the value of k ?
Level 2 (16/06/2022) Shift 3
(a) 3 (b) 4 (c) 6 (d) 2

RRB NTPC CBT - 1
(28/12/2020 to 31/07/2021)

Q.13. Which point on the given number line represents $\frac{6}{5}$?



RRB NTPC 05/01/2021 (Morning)
(a) R (b) W (c) S (d) K

Q.14. If (2 , 7), (5 , 1) , (x , 3) are the vertices of a triangle whose area is 18 (sq units) then find the Possible values of x ?
RRB NTPC 12/01/2021 (Morning)
(a) - 10 or - 2 (b) 10 or - 2
(c) 10 or 2 (d) - 10 or 2

Q.15. Find the equation of the tangents to the circle $x^2 + y^2 = 9$ at x = 2.
RRB NTPC 19/01/2021 (Morning)
(a) $-2x + \sqrt{5y} = 9$ (b) $2x + \sqrt{5}y = 9$
(c) $-2x - \sqrt{5}y = 9$ (d) $2x - \sqrt{5y} = 9$

Q.16. What is the number of all positive solutions of the equation $|x \times 1| = 0$?
RRB NTPC 21/01/2021 (Morning)
(a) 3 (b) 1 (c) 0 (d) 2

Q.17. Find the coordinates of the point which will divide the line joining the point (2,4) and (7,9) internally in the ratio 1:2
RRB NTPC 05/02/2021 (Morning)
(a) $(\frac{5}{3}, \frac{1}{3})$ (b) $(\frac{11}{3}, \frac{17}{3})$
(c) $(\frac{3}{8}, \frac{3}{11})$ (d) $(\frac{8}{34}, \frac{11}{3})$

Q.18. The area, in square units, of a triangle formed by the coordinate axis and the straight line 5x + 7y = 35 is :
RRB NTPC 05/02/2021 (Morning)
(a) $\frac{2}{35}$ (b) $\frac{35}{2}$ (c) $\frac{25}{2}$ (d) 35

Q.19. The position of the point (3,4) with respect to the circle $x^2 + y^2 - 3x - 4y + 1 = 0$:
RRB NTPC 05/02/2021 (Morning)
(a) lies inside it (b) lies outside of it
(c) lies on it (d) cannot be decided

Q.20. If (2 , - 2) and (5 , 2) are two consecutive vertices of a square, then the length of each side of the square will be :
RRB NTPC 08/02/2021 (Evening)
(a) 5 units (b) $5\sqrt{2}$ units
(c) $\frac{55}{\sqrt{2}}$ units (d) $\sqrt{5}$ units

Q.21. If the length of the tangent from (2 , 5) to $x^2 + y^2 - 5x + 4y + k = 0$ is $\sqrt{37}\ units$, Then the value of k is:
RRB NTPC 08/02/2021 (Evening)
(a) 2 (b) 1 (c) - 2 (d) - 1

Q.22. The area of the triangle formed by the line 2x - 4y - 7 = 0 with the coordinate axis is:
RRB NTPC 11/02/2021 (Evening)
(a) $\frac{49}{8}\ unit^2$ (b) $\frac{49}{4}\ unit^2$
(c) $\frac{49}{2}\ unit^2$ (d) $\frac{49}{16}\ unit^2$

Q.23. The distance between two points (a cosα , 0) and (0 , a sinα) is ____.
RRB NTPC 11/02/2021 (Evening)
(a) a (b) |a| (c) |2a| (d) 2a

Q.24. If the radius of the circle $x^2 + y^2$ - 6x + 8y + c = 0 is 6, then the value of c is:
RRB NTPC 11/02/2021 (Evening)
(a) - 10 (b) - 11 (c) 11 (d) 25

Q.25. The position of the point (1, 2) with respect to the circle.
$X^2 + y^2$ - 3x - 4y + 1 = 0
RRB NTPC 22/02/2021 (Morning)
(a) Lies on the circle
(b) Lies outside the circle
(c) Lies inside the circle
(d) Cannot be decided

Q.26. What is the value of β, if the equation $\frac{\beta(x+1)^2}{3} + \frac{(y+2)^2}{4} = 1$ is a circle ?
RRB NTPC 02/03/2021 (Evening)
(a) $\frac{4}{3}$ (b) $\frac{3}{4}$ (c) 1 (d) 12

Q.27. Find the radius of the circle $x^2 + y^2 + 7x + 4y + 9 = 0$.
RRB NTPC 04/03/2021 (Morning)
(a) $\frac{\sqrt{19}}{2}$ (b) $\frac{\sqrt{13}}{2}$ (c) $\frac{\sqrt{23}}{2}$ (d) $\frac{\sqrt{29}}{2}$

Q.28. The distance from the origin to the line 4x + 3y + 6 = 0 is:
RRB NTPC 04/03/2021 (Morning)
(a) $\frac{7}{5}$ (b) $\frac{4}{5}$ (c) $\frac{6}{5}$ (d) $\frac{3}{5}$

Q.29. The intercepts made by the plane 3x - 4y - 2z = 6 with the coordinate axis are:
RRB NTPC 07/03/2021 (Evening)
(a) $-2, -\frac{3}{2}, 3$ (b) $2, \frac{3}{2}, -3$
(c) $-2, \frac{3}{2}, 3$ (d) $2, -\frac{3}{2}, -3$

Q.30. If the distance between two points (x , 7) and (1 , 15) is 10 units, then the possible values of x = ?
RRB NTPC 08/03/2021 (Evening)
(a) 7 , - 5 (b) 4 , 5 (c) 5 , - 7 (d) 3 , 7

Q.31. Which of the following points lies on the x - axis?
RRB NTPC 09/03/2021 (Morning)
(a) (2 , 3) (b) (2 , 0) (c) (1 , 2) (d) (0 , 4)

Q.32. If the center of a circle (c) is (- 2 , 3) and its radius is 4, then find the equation of the circle.
RRB NTPC 09/03/2021 (Evening)
(a) $x^2 + y^2 + 4x + 6y - 3 = 0$
(b) $x^2 + y^2 + 4x - 6y - 3 = 0$
(c) $x^2 + y^2 - 4x + 6y - 3 = 0$
(d) $x^2 + y^2 - 4x + 6y + 3 = 0$

Q.33. Find the centroid of a triangle formed by the points (2 , 5) , (3 , 9) and (4 , 1)
RRB NTPC 11/03/2021 (Evening)
(a) (6, 6) (b) (9, 15) (c) (3, 9) (d) (3, 5)

Q.34. Find the relation between x and y such that the point (x , y) is equidistant from (5 , 3) and (4 , 6).
RRB NTPC 12/03/2021 (Morning)
(a) x + 3y + 9 = 0 (b) x - 3y = 9
(c) x + 3y = 9 (d) 3y - x = 9

Q.35. The ratio in which point (4 , 5) divides the line joining two points (2 , 3) and (7 , 8) is :
RRB NTPC 13/03/2021 (Morning)
(a) 2 : 3 (b) 1 : 2 (c) 4 : 5 (d) 3 : 4

Q.36. The equation of a straight line passing through (-2,5) and (1,3) is:
RRB NTPC 13/03/2021 (Evening)
(a) 3x- 2y - 11 = 0 (b) 2x - 3y - 19 = 0
(c) 3x + 2y + 19 = 0 (d) 2x + 3y - 11 = 0

Q.37. The intercepts made by the plane 3x - 4y -2z = 6 with the coordinate axis are:
RRB NTPC 13/03/2021 (Evening)
(a) $2, \frac{3}{2}, -3$ (b) $-2, -\frac{3}{2}, 3$
(c) $-2, \frac{3}{2}, 3$ (d) $2, -\frac{3}{2}, -3$

Q.38. If 2x + y=15, y + 2z = 17 and x + 2y = 9, then the value of 4x + 3y + z = ?
RRB NTPC 15/03/2021 (Morning)
(a) 37 (b) 40 (c) 39 (d) 38

Q.39. Which of the following equations represent a line parallel to y - axis ?
RRB NTPC 15/03/2021 (Evening)
(a) y = 3 (b) x + 3 = 4 - 2x

(c) 2x + y = 0 (d) y - 2 = 1

Q.40. A circle $x^2 + y^2 = a^2$ passes through a point (0 , 4). What is the value of a ?
RRB NTPC 05/04/2021 (Morning)
(a) 6 (b) 4 (c) 8 (d) 5

Q.41. The measure of the angle between the graph of linear equation 35x - 35y + 15 = 0 and the x - axis is:
RRB NTPC 05/04/2021 (Evening)
(a) 55° (b) 35° (c) 50° (d) 45°

Q.42. The chord of contact of tangents drawn from a point on the circle $x^2 + y^2 = a^2$ to the circle $x^2 + y^2 = b^2$ touches the circle $x^2 + y^2 = c^2$ such that $b^m = a^n c^p$, where m,n,pϵN. Find the value of m + n + p + 10.
RRB NTPC 07/04/2021 (Morning)
(a) 8 (b) 10 (c) 14 (d) 12

Q.43. A circle has a radius of 3 units and its centre lies on the line y = x - 1. Find the equation of the circle if it passes through point (7 , 3).
RRB NTPC 07/04/2021 (Morning)
(a) $x^2 + y^2 - 8x - 6y - 16 = 0$
(b) $x^2 + y^2 - 8x - 6y + 16 = 0$
(c) $x^2 + y^2 + 8x + 6y + 16 = 0$
(d) $x^2 + y^2 + 8x - 6y + 16 = 0$

Q.44. Find the length of the tangent from any point on the circle $x^2 + y^2 + 2011x + 2012y + 2013 = 0$ to the circle $x^2 + y^2 + 2011x + 2012y + 2014 = 0$
RRB NTPC 07/04/2021 (Morning)
(a) 5
(b) 1
(c) 0
(d) No common tangent can be drawn.

Q.45. If a point (1,2) is translated 2 units through the positive direction of x-axis and then the tangents drawn from the point to the circle $x^2 + y^2 = 9$, find the angle between the tangents.
RRB NTPC 07/04/2021 (Morning)
(a) $tan^{-1}(\frac{5}{3})$ (b) $2tan^{-1}(\frac{1}{3})$
(c) $2tan^{-1}(\frac{3}{2})$ (d) $2tan^{-1}(\frac{2}{3})$

Q.46. In a parallelogram PQRS, P= (- 1 , - 1) , Q = (8 , 0) and R = (7 , 5). What are the coordinates of 'S' ?
RRB NTPC 23/07/2021 (Evening)
(a) (- 2 , $\frac{7}{2}$) (b) (- 2 , 4)
(c) (- 1 , 4) (d) ($-\frac{3}{2}$, 4)

Q.47. Find the length of the tangent from the point (2 , 3) to the circle $x^2 + y^2 = 4$.
RRB NTPC 23/07/2021 (Evening)
(a) 3 (b) 4 (c) 1 (d) 2

Q.48. The equation of a line which passes through a point (1 , 5) and perpendicular to the line x – y = 5 , is:
RRB NTPC 24/07/2021 (Morning)
(a) y - x = 4 (b) x + y = 6
(c) x - y = 6 (d) x - y = 4

Q.49. ΔABC is a triangle whose vertices are A(0 , 0), B (a , 5) and C(- 5 , 5). If the triangle is right - angled at A , then find the value of a.
RRB NTPC 26/07/2021 (Morning)
(a) 2 (b) 5 (c) 6 (d) 3

Q.50. Find the number of points on the x - axis that are at a distance of 'c' units (c < 3) from the point (2 , 3).
RRB NTPC 26/07/2021 (Morning)
(a) 0 (b) 3 (c) 1 (d) 2

RRB ALP Tier - 2 (21/01/2019 to 08/02/2019)

Q.51. Find the slope of the line represented by the equation 4x + 6y = 9.
ALP Tier II 21/01/2019 (Afternoon)
(a) $\frac{3}{2}$ (b) $\frac{-2}{3}$ (c) $\frac{-3}{2}$ (d) $\frac{2}{3}$

Q.52. Which point on the X-axis is equidistant from (2, - 5) and (- 2, 9)?
ALP Tier II 21/01/2019 (Afternoon)
(a)(- 7, 0) (b) (- 14, 0) (c) (14, 0) (d) (7, 0)

Q.53. Find the coordinates of the point which divides the line segment joining the points (4 , - 3) and (8 , 5) internally in the ratio 1 : 3. divides in proportion.
ALP Tier II 21/01/2019 (Afternoon)
(a) (- 1, 5) (b) (5, 1) (c) (5, - 1) (d) (- 5, - 1)

Q.54. What is the distance between the points (- 2 , 4) and (4 , 4) ?
ALP Tier II 21/01/2019 (Evening)
(a) 8 units (b) 4 units
(c) 2 units (d) 6 units

Q.55. Give the coordinates of the middle point of the segment joining the points (– 4 , 7) and (2 , 3).
ALP Tier II 23/01/2019 (Morning)
(a) (1, –5) (b) (– 1, 5) (c) (2, 4) (d) (– 2, 3)

Q.56. Find the slope of the line joining the points (3,– 4) and (5, 2).
ALP Tier II 23/01/2019 (Afternoon)
(a) $\frac{1}{3}$ (b) 2 (c) 3 (d) $\frac{1}{2}$

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

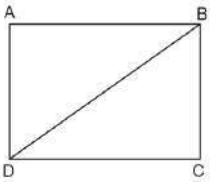
Q.57. The coordinates of the point that divides the line segment joining the points (- 5 , 5) and (7 , – 3) internally in the ratio 3: 1 are given by:
RRB ALP 29/08/2018 (Morning)
(a) (- 2, 3) (b) ($\frac{5}{2}$, 0) (c) (1, 1) (d) (4, - 1)

Answer key:-

1.(d)	2.(d)	3.(d)	4.(a)
5.(a)	6.(a)	7.(a)	8.(d)
9.(b)	10.(d)	11.(c)	12.(b)
13.(a)	14.(b)	15.(b)	16.(c)
17.(b)	18.(b)	19.(b)	20.(a)
21.(c)	22.(d)	23.(b)	24.(b)
25.(c)	26.(b)	27.(d)	28.(c)
29.(d)	30.(a)	31.(b)	32.(b)
33.(d)	34.(d)	35.(a)	36.(d)
37.(d)	38.(c)	39.(b)	40.(b)
41.(d)	42.(c)	43.(b)	44.(d)
45.(c)	46.(b)	47.(a)	48.(b)
49.(b)	50.(a)	51.(c)	52.(a)
53.(c)	54.(d)	55.(b)	56.(c)
57.(d)			

Solution:-

Sol.1.(d)



A(0 , - 2) , B(2 , 1) , C(0 , 4) , D(- 2 , 1)

Area of triangle ABD = $\frac{1}{2}[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$

= $\frac{1}{2}[0 + 6 + 6]$

= $\frac{1}{2} \times 12$ = 6 sq . units

Area of triangle BCD = $\frac{1}{2}[x1(y2 - y3) + x2(y3 - y1) + x3(y1 - y2)]$

= $\frac{1}{2}[6 + 0 + 6]$

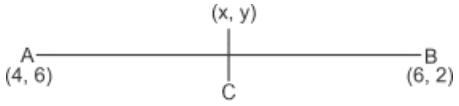
= $\frac{1}{2} \times 12$ = 6 sq . units

Area of quadrilateral ABCD = Area of triangle ABD +Area of triangle BCD

= 6 + 6 = 12 sq .units

Sol.2.(d) 2 x + 3 y = 4.....(1)
3 x - y = - 5.....(2)
By solving eq .(1) and (2),
x = - 1, y = 2
Now,$(3\alpha - 4\beta)$ = - 3 - 8 = - 11

Sol.3.(d)



Point C is equidistant from points A and B
∴ AC = BC
$\Rightarrow \sqrt{(x-4)^2 + (y-6)^2}$
$= \sqrt{(6-x)^2 + (2-y)^2}$
Squaring both sides
$\Rightarrow (x-4)^2 + (y-6)^2 = (6-x)^2 + (2-y)^2$
$\Rightarrow x^2 + 16 - 8x + y^2 + 36 - 12y = 36 + x^2 - 12x + 4 + y^2 - 4y$
$\Rightarrow -8x + 12x - 12y + 4y = 40 - 52$
$\Rightarrow 4x - 8y = -12 \Rightarrow x - 2y = -3$

Short Tricks:-
Point C is equidistant from points A and B.
So,C ≡ $\{(\frac{4+6}{2}), (\frac{6+2}{2})\}$ = (5 , 4)
Now, Go through the option,
Clearly option 4 satisfied with
x = 5 and y = 4 .

Sol.4.(a) Given points of the line are
(- 5 , 6) and (- 6 , 5)
Slope of the given line(m)
$= \frac{y_2 - y_1}{x_2 - x_1} = \frac{5-6}{-6+5} = 1$
Slope of perpendicular line (m')
$= \frac{-1}{m} = -1$ Given point (2 , 3)
Equation of the perpendicular line
⇒ y - 3 = -1(x - 2)
$\Rightarrow y - 3 = -x + 2 \Rightarrow x + y - 5 = 0$

Sol.5.(a)

For all the given equations → $\frac{a_1}{a_2} = \frac{b_1}{b_2}$

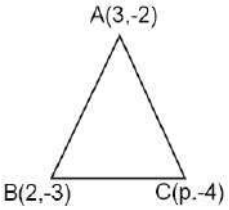
So , all lines are parallel.

Sol.6.(a)
Given points are (3 , 5) (- 7, 4) (10 , - 6)
A/Q ,
Centroid = $\frac{3-7+10}{3}, \frac{5+4-6}{3}$
= (k , 1) ⇒ k = $\frac{6}{3} = 2$

Sol.7.(a)
To find the points of intersection of the line 4x - 3y = 10 and the circle
$x^2 + y^2$ - 2x + 4y - 20 = 0
We have to put $x = \frac{3y+10}{4}$ in the equation of the circle :
$\Rightarrow 25y^2 + 100y - 300 = 0$
$\Rightarrow (y-2)(y+6) = 0$
Then the values of y = - 6, 2 and the values of x = - 2, 4 ;
So, the points of intersections are : (4 , 2) and (- 2 , - 6) ;

Sol.8.(d) Only one line can be drawn with two points.
So, number of straight lines drawn from 4 points = $^4C_2 = \frac{4 \times 3}{2 \times 1} = 6\ lines$

Sol.9.(b)



Area of triangle = $\frac{1}{2}[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$
$\Rightarrow 8 = \frac{1}{2} \times [3 \times 1 + 2 \times (-2) + p \times 1]$
$\Rightarrow 16 = 3 - 4 + p$
$\Rightarrow p = 16 + 1 \Rightarrow p = 17$

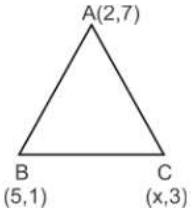
Sol.10.(d) y = 9x² + 16
Let , x = 0 , then y = 16
Let , y = 0 , then $x^2 = \frac{-16}{9}$, x = $\sqrt{\frac{-16}{9}}$
.... imaginary number.
Value of x can't be determine
So , graph of y = 9x² + 16 , neither intersects nor touches the x-axis

Sol.11.(c) 3x - 2y - 11 = 0 ,
x + y = 7
On solving, we get,
x = 5 and y = 2
Equation intersects at P(α , β)
(3α + 5β) = 3 × 5 + 5 × 2 = 25

Sol.12.(b) $kx - 3y = 6$,
$3k - 6 = 6 \Rightarrow 3k = 12 \Rightarrow k = 4$

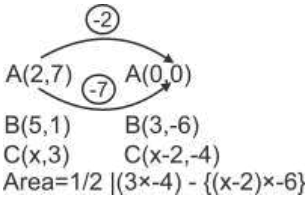
Sol.13.(a) Here we have to find the point for the value = $\frac{6}{5} = 1.2$ As there are 10 divisions between 0 and 1, So, each smallest division represents the value of $\frac{1}{10} = 0.1$, Now if we look at the position of 'R' = $1 + 0.1 \times 2 = 1.2$
i.e. R is the point on the given number line which represents the value of $\frac{6}{5}$

Sol.14.(b)



Area of the triangle = $\frac{1}{2}[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$
$18 = \frac{1}{2}[2(1 - 3) + 5(3 - 7) + x(7 - 1)]$
$18 = \frac{1}{2}[-4 - 20 + 6x]$
36 = | − 24 + 6x |
In "mode" , we get +ve and -ve both values
36 = ± | − 24 + 6x |
So , 36 = - 24 + 6x and 36 = 24 - 6x
x = 10 and x = - 2

Short Tricks:-
Make any one of the given coordinates zero , do the same action with rest coordinates



18 = $\frac{1}{2}|(-12) - \{-6x + 12\}|$
36 = $|(-12) + 6x - 12|$ **=** $|6x - 24|$
In "mode" , we get +ve and -ve both values
36 = ± | − 24 + 6x |
So , 36 = - 24 + 6x and 36 = 24 - 6x
x = 10 and x = - 2

Sol.15.(b) x² + y² = 9 at x = 2
$y = \pm \sqrt{5}$
So now putting value in all the equations, We find that equations
$2x + \sqrt{5}y = 9$
$2x - \sqrt{5}y = 9$

Sol.16.(c) $|x \times 1| = 0$
→ x × 1 = 0 ⇒ x = 0
There is no positive solution.

Sol.17.(b) Given points are (2 , 4) and (7, 9)
$M_1 : M_2$ = 1 : 2
X = $\frac{M_2X_1 + M_1X_2}{M_1 + M_2} = \frac{2 \times 2 + 1 \times 7}{3} = \frac{11}{3}$
Y = $\frac{M_2Y_1 + M_1Y_2}{M_1 + M_2} = \frac{2 \times 4 + 1 \times 9}{3} = \frac{17}{3}$
Point is $(\frac{11}{3}, \frac{17}{3})$

Sol.18.(b) Given , c = 35 , a = 7 and b = 5
As we know that, area of the triangle in

coordinate = $\frac{1}{2} \times \frac{c^2}{ab}$

Hence, $\frac{1}{2} \times \frac{c^2}{ab} = \frac{1}{2} \times \frac{35^2}{7 \times 5} = \frac{35}{2}$

Sol.19.(b) Let , x = 3 and y = 4

Now putting the value of x and y in $x^2 + y^2$ - 3x - 4y + 1= 0

Then , $3^2 + 4^2 - 3 \times 3 - 4 \times 4 + 1 = +1$ (+ ve)

We get +ve value means that the point lies outside of it

NOTE - (i) .when the value is (- Ve) means the point lies inside it.

(ii).when the value is 0 means the point lies on it (circumference of the circle).

Sol.20.(a) Length of side of square

$= \sqrt{(5 - 2)^2 + (2 + 2)^2}$

$= \sqrt{3^2 + 4^2} = \sqrt{9 + 16} = \sqrt{25} = 5\ units$

Sol.21.(c) Given point is (2,5)

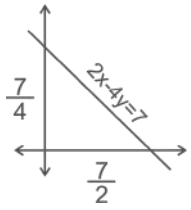
Length of tangent = $\sqrt{37}$

$\sqrt{2^2 + 5^2 - 5 \times 2 + 4 \times 5 + k} = \sqrt{37}$

$\sqrt{39 + k} = \sqrt{37} \Rightarrow$ K = - 2

Sol.22.(d) 2x - 4y - 7 = 0

$\Rightarrow$ 2x - 4y = 7 $\Rightarrow \frac{x}{\frac{7}{2}} - \frac{y}{\frac{7}{4}} = 1$



Area of the triangle = $\frac{1}{2} \times \frac{7}{4} \times \frac{7}{2}$

$= \frac{49}{16}\ unit^2$

Sol.23.(b) Given points are A = (a cosα , 0) , B = (0 , a sinα)

AB = $\sqrt{(a\cos\alpha)^2 + (a\sin\alpha)^2}$

$= \sqrt{a^2(\cos^2\alpha + \sin^2\alpha)} = |a|$

Sol.24.(b) General form of equation of circle = $x^2 + y^2 + 2gx + 2fy + c = 0$

Given equation = $x^2 + y^2$ - 6x + 8y + c = 0

On comparing both the equation we get,

g = - 3 and f = 4

We know that

$r^2 = g^2 + f^2 - c$

$\Rightarrow 36 = 9 + 16 - c \Rightarrow$ c = - 11

Sol.25.(c) Given equation of the circle

= $x^2 + y^2$ - 3x - 4y + 1 = 0

And given point = (1, 2)

Put x = 1 and y = 2 in the given equation

$x^2 + y^2$ - 3x - 4y + 1

= 1 + 4 - 3 - 8 + 1 = 6 - 11 = - 5 (- ve)

The given point lies inside the circle.

Sol.26.(b) $\frac{\beta(x+1)^2}{3} + \frac{(y+2)^2}{4} = 1$

For a circle of m(x - a) + n(y + 2) = 1 then (m = n)

Hence, $\frac{\beta}{3} = \frac{1}{4} \Rightarrow \beta = \frac{3}{4}$

Sol.27.(d) ($x^2 + y^2 + 2gx + 2fy + c = 0$, represents the circle with centre (−g,−f) and radius equal to $a^2 = g^2 + f^2 -$ c.)

$x^2 + y^2 + 7x + 4y + 9 = 0$

Here, g = $\frac{7}{2}$, f = 2 and c = 9

Radius = $\sqrt{g^2 + f^2 - c}$

$= \sqrt{\frac{49}{4} + 4 - 9}$

$= \sqrt{\frac{49}{4} - 5} = \frac{\sqrt{29}}{2}$

Sol.28.(c) Length of the perpendicular from O(0 , 0) to the line 4x + 3y + 6 = 0 is ,

D = $\frac{|Ax + By + C|}{\sqrt{A^2 + B^2}}$

d = $\frac{|4 \times 0 + 3 \times 0 + 6|}{\sqrt{4^2 + 3^2}} = \frac{6}{\sqrt{25}} = \frac{6}{5}$

Sol.29.(d)

To find the intercepts made by the plane 3x - 4y - 2z = 6 with the coordinate axis

we have to keep x = y = 0 to find z intercept

we have to keep y = z = 0 to find x intercept

and we have to keep x = z = 0 to find y intercept ;

So , x = 2 , y = - $\frac{3}{2}$, z = - 3 ;

Sol.30.(a) Distance formula =

$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

10 unit = $\sqrt{(1 - x)^2 + (15 - 7)^2}$

10 = $\sqrt{(x^2 + 1 - 2x) + (8)^2}$

100 = $x^2 + 1 - 2x$ + 64

100 - 65 = $x^2 - 2x$

$x^2 - 2x$ - 35 = 0

Where , x = 7 , - 5

Sol.31.(b) (2 , 0) lies on x - axis because here , y coordinate = 0

Sol.32.(b) Given the center (h , k) = (- 2 , 3) and radius(r) = 4

Therefore the equation of the circle is:

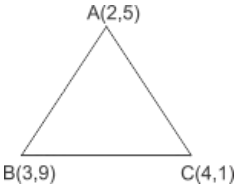
$(x - h)^2 + (y - k)^2 = r^2$

$\Rightarrow (x + 2)^2 + (y - 3)^2 = 4^2$

$\Rightarrow x^2$ + 4x + 4 + y^2 - 6y + 9 = 16

$\Rightarrow x^2 + y^2 + 4x$ - 6y - 3 = 0

Sol.33.(d)



Let , Centroid of a triangle = (X , Y)

Now , X = $\frac{x_1 + x_2 + x_3}{3}$

$= \frac{2 + 3 + 4}{3} = \frac{9}{3} = 3$

And Y = $\frac{Y_1 + Y_2 + Y_3}{3}$

$= \frac{5 + 9 + 1}{3} = \frac{15}{3} = 5$

Hence , Centroid of a triangle

= (X , Y) = (3 , 5)

Sol.34.(d) Point (x, y) is equidistant from (5 , 3) and (4,6) so the distance of point (x , y) from both points will be equal

$\sqrt{(x - 5)^2 + (y - 3)^2} = \sqrt{(x - 4)^2 + (y - 6)^2}$

Squaring both sides we get

$\Rightarrow (x - 5)^2 + (y - 3)^2 = (x - 4)^2 + (y - 6)^2$

$\Rightarrow x^2 + 25 - 10x + y^2 + 9 - 6y = x^2 + 16 - 8x + y^2 + 36 - 12y$

$\Rightarrow -10x - 6y + 34 = -8x - 12y + 52$

$\Rightarrow -2x + 6y - 18 = 0 \Rightarrow 3y - x = 9$

Sol.35.(a) Let the point divides the line segment in the ratio m : n

From section formula, we have

X = $\frac{mx_2 + nx_1}{m + n} \Rightarrow 4 = \frac{7m + 2n}{m + n}$

$\Rightarrow 4m + 4n = 7m + 2n$

$\Rightarrow 3m = 2n \Rightarrow \frac{m}{n} = \frac{2}{3}$ = 2 : 3

Sol.36.(d) General equation of a straight line passing through two points

(y - y_1) = $\frac{y_2 - y_1}{x_2 - x_1}$ (x - x_1)

Given , (x_1 , y_1) = (- 2 , 5) and (x_2 , y_2) = (1 , 3)

(y - 5) = $\frac{3 - 5}{1 + 2}$ (x + 2) $\Rightarrow$ 2x + 3y - 11 = 0

Sol.37.(d) General equation of intercept in plane = $\frac{x}{a} + \frac{y}{b} + \frac{z}{c}$ = 1

3x - 4y - 2z = 6 ----(i)

Both side divide by 6 in Equation (i)

$\frac{3x}{6} - \frac{4y}{6} - \frac{2z}{6} = 1 \Rightarrow \frac{1x}{2} - \frac{2y}{3} - \frac{z}{3} = 1$

Now , the coordinate are 2 , - $\frac{3}{2}$, - 3

Sol.38.(c) 2x + y = 15 ----(i)
y + 2z = 17 ---(ii)
And x + 2y = 9 -----(iii)
From equation (i) & (iii)
x = 7 , y = 1
Putting the value of Y in equation (ii)
1 + 2z = 17 ⇒ z = 8
Now , 4x + 3y + z = 28 + 3 + 8 = 39

Sol.39.(b)
Any line parallel to y axis must have y = 0
X + 3 = 4 - 2x ⇒ 3x = 1 ⇒ X = $\frac{1}{3}$

Sol.40.(b) Equation of the given circle
= $x^2 + y^2 = a^2$
It passes through the given point (0,4), so it must satisfy the given equation
Put x = 0 and y = 4
$x^2 + y^2 = a^2$
$0 + 4^2 = a^2 \Rightarrow a^2 = 16 \Rightarrow a = 4$

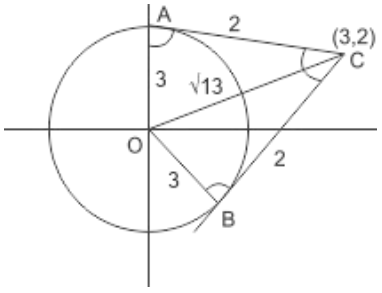
Sol.41.(d) 35x - 35y + 15 = 0
y = x + $\frac{3}{7}$
General equation of line , y = mx + c
slope (m) = tanθ ⇒ tanθ = 1
tanθ = tan 45° ⇒ θ = 45°

Sol.42.(c) Let, there is a point P (h , k) on the circle $x^2 + y^2 = a^2$.
(h , k) will satisfied the equation $x^2 + y^2 = a^2 \Rightarrow h^2 + k^2 = a^2$
The equation of the chord of the contact of the tangent drawn from the point P (h , k)
To the circle $x^2 + y^2 = b^2$ will be
hx + ky = b^2
Perpendicular distance of the tangent from the center of the circle $x^2 + y^2 = c^2$
Will be equal to the radius of the circle.
$\Rightarrow \left| \frac{-b^2}{\sqrt{h^2 + k^2}} \right| = c \Rightarrow \left| \frac{-b^2}{a} \right| = c$
$\Rightarrow b^2$ = ac
Comparing it with $b^m = a^n c^p$
⇒ p = 1 , n = 1 and m = 2
∴ m + n + p + 10 = 2 + 1 + 1 + 10 = 14

Sol.43.(b) Given , radius = 3 unit and centre lies on the line y = x -1
Let " x " coordinate of the center = h
Then , c (h , h -1)
So , $(x - h)^2 + \{y - (h - 1)\}^2 = 9$
A/Q , it passes through the point (7 , 3)
Then ,
$(7 - h)^2 + \{3 - (h - 1)\}^2$
= 9 ⇒ h = 7 or 4
Hence , center = (4 , 3) or (7 , 6)
Equations are
$(x - 4)^2 + (y - 3)^2 = 9$ -------- (i)
$(x - 7)^2 + (y - 6)^2 = 9$ -------- (ii)
From equation (i) and (ii)
$x^2 + y^2 - 8x - 6y + 16 = 0$

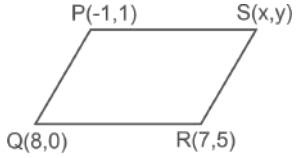
Sol.44.(d)
Given equation of the circles are
$x^2 + y^2 + 2011x + 2012y + 2013 = 0$
And
$x^2 + y^2 + 2011x + 2012y + 2014 = 0$
If we observe both equations we found that the Coefficients of x and y are same
So the centre of both circles is the same.
So no common tangent can be drawn.

Sol.45.(c)



Given point is (1 , 2)
After translating, new point is (3 , 2)
Let the angle made by both tangents = 2θ
By distance formula,
OC = $\sqrt{(3 - 0)^2 + (2 - 0)^2}$
= $\sqrt{9 + 4} = \sqrt{13}$
In ΔAOC
AC = $\sqrt{13 - 9} = \sqrt{4} = 2$
tanθ = $\frac{3}{2}$
$\Rightarrow \theta = tan^{-1}(\frac{3}{2})$
Angle between tangents = 2θ
= $2tan^{-1}(\frac{3}{2})$

Sol.46.(b)

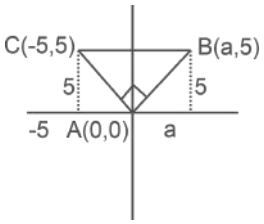


In parallelogram opposite sides are equal.
PQ = RS
$\Rightarrow \sqrt{(8 + 1)^2 + (0 + 1)^2}$
$= \sqrt{(7 - x)^2 + (5 - y)^2}$
Verify the equation by the options given
Option (b) x = - 2 and y = 4
Satisfy the equation so (- 2 , 4) will be the co - ordinate of S.

Sol.47.(a) $x^2 + y^2 = 4$
Length of tangent from (2, 3)
= $\sqrt{2^2 + 3^2 - 4} = \sqrt{9}$ = 3

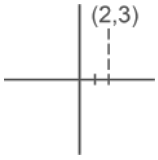
Sol.48.(b) Given line is x − y = 5
Slope = $\frac{-(coefficient\ of\ y)}{coefficient\ of\ x}$ = 1
slope of given line = 1 = m
slope of perpendicular line = - $\frac{1}{m}$ = - 1
Equation of line passing through (1 , 5) is:
y - 5 = - 1 (x - 1) ⇒ y - 5 = - x + 1 ⇒ x + y = 6

Sol.49.(b)



Here in the above diagram :
ΔABC is a triangle whose vertices are A(0 , 0) , B (a , 5) and C(- 5 , 5). If the triangle is right - angled at A;
Then AB = $\sqrt{25 + a^2}$, BC = (a + 5) ,
AC = $5\sqrt{2}$;
i.e . $BC^2 = AB^2 + AC^2$
$\Rightarrow a^2 + 10a + 25 = 25 + a^2 + 50$
$\Rightarrow a = 5$

Sol.50.(a) From the given information we can draw the following diagram :



So, here we can see the distance of the point (2 , 3) from the X - axis is 3 ;
Then there will not be any point having distance < 3 on the X- axis.

Sol.51.(c) $4x + 6y = 9$
Slope (m) = $\frac{-(coefficient\ of\ y)}{coefficient\ of\ x} = \frac{-6}{4}$
= $\frac{-3}{2}$

Sol.52.(a) The coordinate of that point which intersect the line of point A (2 , - 5) and B (- 2 , 9)
The point is on x axis , (x , 0) and m : n = 1 : 1
A(2,-5) P(x,0) B(-2,9)
$\sqrt{(x - 2)^2 + (0 + 5)^2} = \sqrt{(-2 - x)^2 + 9^2}$
$\Rightarrow x^2 + 4 - 4x + 25 = x^2 + 4 + 4x + 81$
$\Rightarrow 8x = -56 \Rightarrow x = -7$
So, coordinate of point P = (- 7 , 0)

Sol.53.(c) The coordinate of that point which intersect the line of point A (4 , - 3) and B (8 , 5) in the ratio 1 : 3
(x , y) = $(\frac{mx_2 + nx_1}{m + n} , \frac{my_2 + ny_1}{m + n})$

(x , y) = $\frac{8+12}{4}$, $\frac{5+(-9)}{4} = (5 , -1)$

Sol.54.(d) Given points are A (- 2 , 4) and B (4 , 4)

AB = $\sqrt{(4-4)^2+(4+2)^2} = \sqrt{36}$

= 6 units

Sol.55.(b) A(– 4 , 7) and B (2 , 3)

Midpoint of AB → $\frac{x_1+x_2}{2}$ and $\frac{y_1+y_2}{2}$

= $\frac{-4+2}{2}$, $\frac{7+3}{2}$ = (– 1 , 5)

So, (– 1 , 5) is the midpoint of the two given points.

Sol.56.(c) Given points (3 , - 4) and (5 , 2)

The slope of a line (m) → $\frac{y_2-y_1}{x_2-x_1}$

= $\frac{2-(-4)}{5-3}$ = 3 units

Sol.57.(d) As we know, The coordinates of the point that divides the line segment joining the points (x_1 , y_1) and (x_2 , y_2) internally in the ratio m : n are given by ; ($\frac{mx2+nx1}{m+n}$ and $\frac{my2+ny1}{m+n}$)

So, the required coordinates of the point

= ($\frac{3\times7+1\times-5}{3+1}$, $\frac{3\times-3+1\times5}{3+1}$)

= ($\frac{16}{4}$, $\frac{-4}{4}$) = (4 , - 1)

Probability

Definition :- Probability can be defined as the ratio of the number of favorable outcomes to the total number of outcomes of an event.
The value of the probability of an event to happen can lie between 0 and 1 because the favorable number of outcomes can never cross the total number of outcomes. Also, the favorable number of outcomes cannot be negative.

Examples :- Flipping or tossing of a coin, Rolling a dice, Drawing a ball from a bag containing a number of balls, etc. all such events lead to finding the probability.
The formula for probability →

$$P(E) = \frac{Number\ of\ Favorable\ Outcomes}{Number\ of\ total\ outcomes.}$$

Let us consider some of the popular events or conditions one by one :

i) Flipping or tossing of a coin →
Suppose a coin tossed then we get two possible outcomes either a head (H) or a tail (T) , there is no other possibility.
and it is impossible to predict whether the result of a toss will be a head or tail.
So , total Possible outcomes = 2
(a) Here, probability of getting a head →

$$\frac{Number\ of\ times\ heads\ shows\ up}{number\ of\ total\ possible\ outcomes} = \frac{1}{2}$$

(b) Probability of getting a tail →

$$\frac{Number\ of\ times\ tail\ shows\ up}{number\ of\ total\ possible\ outcomes} = \frac{1}{2}$$

ii) Rolling a dice →
When a dice is rolled once, it will be 1, 2, 3, 4, 5 or 6 only, there is no other possibility.

iii) Drawing a card from a deck of card→
A deck containing 52 cards is grouped into four suits of Spade (♠), club (♣) , heart (♥), and diamond (◆).

Important terms in probability **:-**
1. Event : A probability event can be defined as a set of outcomes of an experiment.
The probability of an event E is a number P(E) such that $0 \le P(E) \le 1$

2. Elementary event : An event having only one outcome. Sum of all probabilities of all the elementary events of an experiment = 1.

3. Sure or certain event : The probability of such an event is equal to 1.

4. Impossible events : The probability of such an event is zero.
For example, in an experiment of rolling a dice, the probability of getting a number greater than 6, is an impossible event.

5. Complementary events : For any event, $P(E) + P(\overline{E}) = 1$
Where $\overline{E}$ stands for "not E".
Also, $P(E) = 1 - P(\overline{E})$
Here E and $\overline{E}$ are called complementary events.

6. Equally likely outcomes : All outcomes with equal probability

7. Sample space : A sample space is a collection or a set of possible outcomes of a random experiment.
Example – Sample space for tossing of a coin once gives S = {H, T}
Sample space for tossing a coin twice gives S = {HH, HT, TH, TT}
Sample space for rolling a dice gives S = {1,2,3,4,5,6}

8. Simple event : If an event E has only one sample point of a sample space, it is called a simple (or elementary) event.
For example, in the experiment of tossing two coins, the sample space obtained is
S = { HH, HT, TH, TT }
There are four simple events as follows :
These are, E_1={HH}, E_2= {HT}, E_3= {TH}, E_4= {TT}

9. Compound event : If an event has more than one sample point, it is called a compound event.
Example – In the experiment of "tossing a coin thrice", the events **:-**
X – 'Exactly one head appeared'
Y– 'At Least one head appeared'
Z– 'Atmost one head appeared' etc.
are all compound events. The subsets of S associated with these events are
X={HTT,THT,TTH}
Y={HTT,THT, TTH, HHT, HTH, THH, HHH}
Z= {TTT, THT, HTT, TTH}
Each of the above subsets contain more than one sample point, hence they are all compound events.

10. The event A and B (A∩B**)**
Intersection of two sets A∩B is the set of those elements which are common to both A and B ie., belonging to 'both A and B'
Suppose, S = {1,2,3,4,5,6,7} ,
A = {2,3,5} and B = {1,3,5}
Here, A∩B = {3,5}
11. The event 'A or B' ($A \cup B$**)**
When the sets A and B are two events associated with a sample space, then '$A \cup B$' means A union B.
$A \cup B$ is the event 'either A or B or both'
Suppose, S = {1,2,3,4,5,6,7} , A = {2,3,5} and B = {1,3,5}
Here, $A \cup B$ = {1,2,3,5}

12. Relation between above two mentioned events :
$P(A \cup B)$ = P(A) + P(B) - P(A ∩ B)

13. The event A but not B :
Set of all those elements which are present in A but not in B.
Is is denoted as : $A - B = A \cap B'$

14. The event B but not A :
Set of all those elements which are present in A but not in B.
Is is denoted as : $B - A = B \cap A'$
Example :-
Suppose → S = {1,2,3,4,5,6,7} ,
A = {2,3,5} and B = {1,3,5}
A or B means $A \cup B$ = {1,2,3,5}
A and B means A∩B = {3,5}
B but not A means $B \cap A'$= {1}
A but not B means $A \cap B'$= {2}
Not A means A' = {1,4,6,7}
Not B means B' = {2,4,6,7}

15. Mutually exclusive events :
Mutually exclusive events or disjoint events are those events which do not occur at the same time.
Example :-
when a coin is tossed then the result will be either head or tail, but we cannot get both the results.

16. Exhaustive event
Exhaustive events are those events whose union is equal to the sample space of the experiment. or
E1, E2, E3.....En are said to be Exhaustive events if at least one of them necessarily happens whenever is performed.
Example :-
In rolling a die once, the possible outcomes or the sample space →
S = {1,2,3,4,5,6}
X : a number less than 4 appears
Y : a number greater than 2 or less than 5 appears
Z : a number greater than 4 appears
Now, X∪Y∪Z = {1,2,3} ∪ {3,4} ∪ {5,6} = S
Such events are said to be exhaustive. Here, it can be clearly seen, whenever the experiment will be performed, at least one of them will necessarily occur.

17. Independent events

Definition 1: Two events are said to be independent if the occurrence of one of them is not affected by the occurrence of the other.

Example :-

Consider the experiment of drawing a card from a deck of 52 playing cards, in which

The elementary events are assumed to be equally likely. If E and F denote the events

'the card drawn is a spade' and 'the card drawn is an ace' respectively, then

Therefore, P(E) = P(F) = $\frac{13}{52} = \frac{1}{4}$

That means, both are equal and are not affected by the occurrence of the other.

Definition 2 : Two events are said to be independent if

P(F|E) = P(F) provided P(E) ≠ 0

P(E|F) = P(E) provided P(F) ≠ 0

Definition 3 : two events are said to be independent if

P(E ∩ F) = P(E) × P(F)

18. Biased and unbiased coin

Unbiased coin : A fair coin having equal probability of getting a head or a tail.

Here,

Probability of getting a head P(H) = $\frac{1}{2}$

Probability of getting a tail P(T) = $\frac{1}{2}$

Biased coin : an unfair coin having unequal probability of getting a head or a tail.

Such coins have more or less probability of getting a particular face.

19. Conditional probability

The probability of an event E is called conditional probability of E, given that F has already occurred and is denoted by P(E|F) .

Example :-

Tossing of a coin thrice, or tossing three coins simultaneously gives the sample space

S = {HHH, THH, HTH, HHT, TTT, TTH, THT, HTT}

Let E be the event, two tails appear, therefore E = {TTT, HTT, THT, TTH} ⇒

P(E) = $\frac{4}{8} = \frac{1}{2}$

And F be the event in which, first coin shows head, therefore, H = {HTT, HHH, HHT, HTH} ⇒ P(F) = $\frac{4}{8} = \frac{1}{2}$

Also, E ∩ F = {HTT} ⇒ P(E ∩ F) = $\frac{1}{4}$

Now, suppose that if it is given that the first coin shows tail, ie., F occurs, and then we have to find the probability of E. Then in this case, we have to find the conditional probability.

The conditional probability of E, given that F has already occurred is calculated as follows

P(E|F)= $\frac{number\ of\ elementary\ events\ favorable\ to\ E \cap F}{number\ of\ elementary\ events\ favorable\ to\ F}$

⇒ P(E|F) = $\frac{P(E \cap F)}{P(F)}$

Therefore, P(E|F) = $\frac{\frac{1}{4}}{\frac{1}{2}} = \frac{1}{2}$

20. Permutation and Combination

Definition of permutation : a permutation is an arrangement in a definite order of a number of objects taken some or all at a time.

a). The number of permutations of 'n' different things taken 'r' at a time, where repetition is not allowed is given by n

$n_{P_r} = \frac{n!}{(n-r)!}$

Where, 0 ≤ r ≤ n

b). n! = 1 × 2 × 3 ×.....× n

c). n! = n × (n - r)!

d). The number of permutations of 'n' different things taken 'r' at a time, where repetition is allowed is given by

n^r , Where, 0 ≤ r ≤ n

e). The number of combinations of 'n' different things taken 'r' at a time, is given by

$n_{C_r} = \frac{n!}{(n-r)!\,r!}$, 0 ≤ r ≤ n

Note :-

(i) n_{C_1} = n and **(ii)** n_{C_0} = 1

Example :-

Suppose, a bag contains '6' red, 4 white and 8 blue balls. If three balls are drawn at random, then finding the probability, of 1 red and 2 white balls as

No. of ways to draw 1 red ball out of 6 = $^6C_1$

No. of ways to draw 2 white ball out of 4 = $^4C_2$

No. of ways to draw 3 balls out of 18 = $^{18}C_3$

Required probability = $\frac{n(E)}{n(S)}$

= $\frac{^6C_1 \times {}^4C_2}{^{18}C_3} = \frac{3}{68}$

Some key points to remember :

1. Tossing of a coin once, gives the sample space S = {H,T}
2. Tossing of a coin twice or tossing of two coins simultaneously is the same experiment and in both the cases we get the sample sample space S = {HH, HT, TH, TT}
3. Tossing of a coin thrice or tossing of three coins simultaneously is the same experiment and in both the cases we get the sample space S = {HHH, THH, HTH, HHT, TTT, HTT, THT, TTH}
4. Rolling of a dice once, gives the sample space S = {1,2,3,4,5,6}
5. Rolling of a dice twice, or Rolling two die simultaneously is the same experiment and in both the cases,

We get the sample space S =

1,1	1,2	1,3	1,4	1,5	1,6
2,1	2,2	2,3	2,4	2,5	2,6
3,1	3,2	3,3	3,4	3,5	3,6
4,1	4,2	4,3	4,4	4,5	4,6
5,1	5,2	5,3	5,4	5,5	5,6
6,1	6,2	6,3	6,4	6,5	6,6

6. A "standard" deck of playing cards consists of 52 Cards and further categorized into 4 suits of Spade (♠), club (♣) , heart (♥), and diamond (◆) constituting 13 cards each.

Each suit contains 13 cards: Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen and King.

a). Number cards(2,3.....9,10) → 9 × 4 = 36,

, Face cards (J,Q,K,) → 3 × 4 = 12

Ace cards (A) → 1 × 4 = 4

Variety Questions

Q.1. In a chess tournament, there are 125 participants. The game will be played on a knock-out basis. How many matches are to be played in the entire tournament?

NTPC CBT - I 27/01/2021 (Evening)

(a) 124 (b) 125 (c) 62 (d) 84

Q.2. If 9 students are standing on a circular path, then the probability that 2 of them are always standing together is.

NTPC CBT - I 17/02/2021 (Morning)

(a) $\frac{1}{4}$ (b) $\frac{2}{7}$ (c) $\frac{7}{8}$ (d) $\frac{1}{3}$

Q.3. 'n' number of persons stand on the circumference of a circle at distinct

points. Each possible pair of persons, not standing next to each other, sings a two minute song. One pair after the other. If the total time taken for singing is 40 minutes, then what is the value of 'n'?
NTPC CBT - I 14/03/2021 (Evening)
(a) Six (b) Eight (c) Five (d) Seven

Q.4. A bag contains balls numbered 1, 2, 3, ……. 30. One ball is drawn from the bag at random. What is the probability that the number on the ball drawn is divisible by 4 or 6?
NTPC CBT - I 06/04/2021 (Evening)
(a) $\frac{1}{15}$ (b) $\frac{1}{3}$ (c) $\frac{3}{10}$ (d) $\frac{2}{5}$

Q.5. If ${}^{n}C_{4} = 70, \ then$ find n.
NTPC CBT - I 31/07/2021 (Morning)
(a) 4 (b) 8 (c) 5 (d) 6

Q.6.A box contains 3 black and 4 red balls. Another box contains 2 black and 3 red balls. The balls taken out of these boxes are mixed together and placed in a third box. Now two balls are selected at random from the third box. Find the probability that one ball is black and the other is red?
ALP Tier II 21/01/2019 (Afternoon)
(a) 35/66 (b) 35/144 (c) 5/66 (d) 5/48

Practice Questions

RRB NTPC CBT - 1 (28/12/2020 to 31/07/2021)

Q.7. Two dice are thrown simultaneously and the sum of the numbers appearing on them is noted. What is the probability that the sum is 12?
RRB NTPC 30/12/2020 (Morning)
(a) $\frac{12}{36}$ (b) 36 (c) $\frac{1}{36}$ (d) 3

Q.8. A box contains 6 white, 2 black and 3 red balls. If a ball is drawn at random, what is the probability that it will not be white.
RRB NTPC 09/01/2021 (Morning)
(a) $\frac{5}{6}$ (b) $\frac{6}{5}$ (c) $\frac{5}{11}$ (d) $\frac{6}{11}$

Q.9. A box contains 6 white balls and 7 black balls. Two balls are drawn at random. What is the probability the both of them are of different colours?
RRB NTPC 22/02/2021 (Evening)
(a) $\frac{4}{13}$ (b) $\frac{2}{13}$ (c) $\frac{6}{13}$ (d) $\frac{7}{13}$

Q.10. Two letters selected from the word 'TENDULKAR'. The probability that both are vowels is:
RRB NTPC 22/02/2021 (Evening)
(a) $\frac{2}{9}$ (b) $\frac{1}{12}$ (c) $\frac{5}{9}$ (d) $\frac{5}{12}$

Q.11. Two integers are selected at random from the first 11 natural numbers. If the sum of the integers is even, then the probability that both the numbers are odd is:
RRB NTPC 01/03/2021 (Morning)
(a) $\frac{13}{121}$ (b) $\frac{3}{5}$ (c) $\frac{4}{9}$ (d) $\frac{5}{11}$

Q.12. Five salesmen A,B,C,D and E, of a company are considered for a three member trade delegation to represent the company at an international trade conference. What is the probability that A gets selected?
RRB NTPC 01/03/2021 (Morning)
(a) $\frac{3}{5}$ (b) $\frac{2}{5}$ (c) $\frac{4}{5}$ (d) $\frac{1}{5}$

Q.13. A card is drawn at random from a pack of playing cards. What is the probability of getting a face card?
RRB NTPC 04/03/2021 (Morning)
(a) $\frac{5}{13}$ (b) $\frac{1}{13}$ (c) $\frac{4}{13}$ (d) $\frac{3}{13}$

Q.14. In tossing three coins at a time, the probability of getting at least one heads is:
RRB NTPC 04/03/2021 (Morning)
(a) $\frac{7}{8}$ (b) $\frac{1}{2}$ (c) $\frac{1}{8}$ (d) $\frac{3}{8}$

Q.15. A dice is thrown twice and the sum of the appearing numbers is 10. Then the probability that the number 5 has appeared at least once is:
RRB NTPC 07/03/2021 (Evening)
(a) $\frac{1}{4}$ (b) $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) $\frac{1}{2}$

Q.16. For two events A and B, P(A) = $\frac{1}{3}$, P(B) = $\frac{1}{4}$ and P(A∪ B) = $\frac{1}{2}$ find P($\frac{A}{B}$) = ?
RRB NTPC 08/03/2021 (Evening)
(a) $\frac{1}{4}$ (b) 1 (c) $\frac{1}{2}$ (d) $\frac{1}{3}$

Q.17. Two cards are drawn from a pack of 52 cards. The probability that out of 2 cards, one card is red and one card is black is:
RRB NTPC 08/03/2021 (Evening)
(a) $\frac{1}{2}$ (b) $\frac{13}{25}$ (c) $\frac{25}{51}$ (d) $\frac{26}{51}$

Q.18. If different combinations are formed using the letters B,A,R,E and arranged in the order in which they would appear in an English dictionary, the combination 'BARE' will be at the _____ position.
RRB NTPC 11/03/2021 (Morning)
(a) 8th (b) 10th (c) 7th (d) 6th

Q.19. 10 points are placed uniformly along the perimeter of a circle. Let A and B be two points among these such that they are the end points of a diameter. If a triangle formed using three of these points is chosen at random, what is the probability that it will lie completely on one side of AB, the points A and B being included?
RRB NTPC 11/03/2021 (Evening)
(a) $\frac{1}{5}$ (b) $\frac{1}{2}$ (c) $\frac{1}{3}$ (d) $\frac{1}{6}$

Q.20. if we select 3 persons randomly from a group, consisting of 4 men, 3 women and 2 boys, then the probability that 2 men are selected is:
RRB NTPC 13/03/2021 (Morning)
(a) $\frac{5}{14}$ (b) $\frac{7}{12}$ (c) $\frac{3}{14}$ (d) $\frac{5}{28}$

Q.21. An urn contains 10 black and 5 white balls. Two balls are drawn from the urn one after the other without replacement. What is the probability that both drawn balls are black?
RRB NTPC 13/03/2021 (Morning)
(a) $\frac{2}{7}$ (b) $\frac{3}{7}$ (c) $\frac{4}{7}$ (d) $\frac{5}{7}$

Q.22. A bag contains cards numbered between 33 and 92. If one card is drawn from the bag, the probability that the number on the drawn card is a perfect square is:
RRB NTPC 01/04/2021 (Morning)
(a) $\frac{5}{59}$ (b) $\frac{4}{59}$ (c) $\frac{1}{15}$ (d) - $\frac{1}{12}$

Q.23. Kings and Queens of black colour are taken out from a deck of 52 playing cards. A card is drawn from the remaining well-shuffled cards. Probability of getting a spade card is:
RRB NTPC 01/04/2021 (Morning)
(a) $\frac{1}{4}$ (b) $\frac{11}{13}$ (c) $\frac{11}{48}$ (d) $\frac{11}{52}$

Q.24. A bag contains balls numbered 1, 2, 3, ……..20. One ball is drawn from the bag at random. What is the probability that the number on the ball drawn is divisible by 3 or 5 ?
RRB NTPC 06/04/2021 (Evening)
(a) $\frac{2}{5}$ (b) $\frac{1}{2}$ (c) $\frac{9}{20}$ (d) $\frac{1}{10}$

Q.25. If $10P_{r} = 5040,$ Find the value of r.
RRB NTPC 24/07/2021 (Evening)

(a) 5 (b) 6 (c) 3 (d) 4

Q.26. A bag contains 2 red , 3 green and 2 blue balls. Two balls are drawn at random. What is the probability that none of the balls drawn is blue?
RRB NTPC 31/07/2021 (Evening)
(a) $\frac{10}{21}$ (b) $\frac{6}{21}$ (c) $\frac{10}{14}$ (d) $\frac{5}{7}$

RRB JE
(22/05/2019 to 28/06/2019)

Q.27. Out of 5 cards with numbers 1, 2, 3, 4, 5, two are picked at random one after the other. What is the probability that the number in the second card is odd?
RRB JE 29/05/2019 (Morning)
(a) $\frac{3}{10}$ (b) $\frac{1}{6}$ (c) $\frac{3}{4}$ (d) $\frac{3}{5}$

Q.28. What is the probability that a two-digit number chosen at random number is not a prime number?
RRB JE 29/05/2019 (Afternoon)
(a) $\frac{7}{30}$ (b) $\frac{23}{30}$ (c) $\frac{21}{90}$ (d) $\frac{67}{90}$

Q.29. A black, a red and a green dice are thrown at the same time. What is the probability that the sum of the three numbers is ≥ 17 ?
RRB JE 30/05/2019 (Evening)
(a) $\frac{7}{216}$ (b) $\frac{5}{216}$ (c) $\frac{1}{54}$ (d) $\frac{1}{36}$

Answer Key:-

1.(a)	2.(a)	3.(b)	4.(b)
5.(b)	6.(a)	7.(c)	8.(c)
9.(d)	10.(b)	11.(b)	12.(a)
13.(d)	14.(a)	15.(b)	16.(d)
17.(d)	18.(a)	19.(c)	20.(a)
21.(b)	22.(c)	23.(c)	24.(c)
25.(d)	26.(a)	27.(d)	28.(b)
29.(c)			

Solution:-

Sol.1.(a)
No. of matches played = 125 - 1 = 124.

Sol.2.(a) Total arrangement of 9 students in a circle = 8!
Total number of arrangements formed when two students are always together = 7! × 2!
Probability = $\frac{7! \times 2}{8!} = \frac{1}{4}$

Sol.3.(b) Number of pairs = $\frac{40}{2} = 20$
Pairs formed by standing next to each other = n
$\Rightarrow {}^{n}C_2 - n = 20 \Rightarrow \frac{n(n-1)}{2} - n = 20$
$n^2 - n - 2n = 40 \Rightarrow n = 8$

Sol.4.(b) Total number of balls = 30
Multiple of 4 between 1 and 30 = 7
Multiple of 6 = 5
Common multiple of 4 and 6 = 2
Favorable outcomes = 7 + 5 - 2= 10
Required probability = $\frac{10}{30} = \frac{1}{3}$

Sol.5.(b) ${}^{n}C_4 = 70$
$\Rightarrow \frac{n(n-1)(n-2)(n-3)}{1 \times 2 \times 3 \times 4} = 70$
$\Rightarrow n(n-1)(n-2)(n-3) = 70 \times 24$
$\Rightarrow n(n-1)(n-2)(n-3)$
$= 8 \times 7 \times 6 \times 5$
On comparing we get n = 8

Sol.6.(a) Box 1 → 3 black and 4 red balls.
Box 2 → 2 black and 3 red balls.
Now, Box 3 = box 1 + box 2
Box 3 → 5 black and 7 red balls.
Total number of favorable outcomes → $5c_1 \times 7c_1 = 5 \times 7 = 35$
Total number of outcomes → $12c_2 = 66$
Required probability → $\frac{35}{66}$

Sol.7.(c) When two dice are thrown simultaneously, the total number of events will be
= 6 × 6 = 36
the sum of the numbers appearing on them will come to be 12 in only one possible way
i.e. (6 + 6 = 12)
So,
the probability that the sum is 12 = $\frac{1}{6 \times 6} = \frac{1}{36}$

Sol.8.(c) Total Number of events = 11,
Number of events in favour of the condition = $5C_1 = 5$,
So, the probability that the ball will not be white = $\frac{5}{11}$

Sol.9.(d)
In the bag 6 white balls and 7 black balls.
Probability of both the balls drawn are of different colour = $\frac{7}{13} \times \frac{6}{12} + \frac{6}{13} \times \frac{7}{12} = \frac{7}{26} + \frac{7}{26} = \frac{7}{13}$

Sol.10.(b) TENDULKAR
Total letters = 9, Vowels = 3
If two letters are selected and both should be vowel
No. of ways = $3C_2 = 3$
Total number of ways of selection of two letters
$= 9C_2 = 36$
Probability = $\frac{3}{36} = \frac{1}{12}$

Sol.11.(b) First 11 natural number
= 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Odd = 6
If two numbers are selected and the sum of both the numbers is a even number, then
Favorable outcomes = $6C_2 = 15$
Total outcomes = $6C_2 + 5C_2 = 15 + 10$
= 25
The probability that both the numbers are odd = $\frac{15}{25} = \frac{3}{5}$

Sol.12.(a)
Total salesman = 5 (A, B, C, D, E)
3 members should be selected and A must be selected
Favorable outcomes = $1 \times 4C_2 = 6$
Total outcomes = $5C_3 = 10$
Required probability = $\frac{6}{10} = \frac{3}{5}$

Sol.13.(d) Total cards = 52
Face cards = 12
Probability of drawing a face card
= $\frac{12}{52} = \frac{3}{13}$

Sol.14.(a)
Total outcomes = $2 \times 2 \times 2 = 8$
Favorable outcomes = 8 - 1(all tail) = 7
The probability of getting at least one heads = $\frac{7}{8}$

Sol.15.(b)
Total outcome = (5 , 5) , (6 , 4) , (4 , 6)
favorable outcome = (5 , 5)
Required Probability = $\frac{1}{3}$

Sol.16.(d) Given that,
$P(A) = \frac{1}{3}$, $P(B) = \frac{1}{4}$ and $P(A \cup B) = \frac{1}{2}$
$P(A \cup B) = P(A) + P(B) - P(A \cap B)$
$\Rightarrow \frac{1}{2} = \frac{1}{3} + \frac{1}{4} - P(A \cap B)$
$\Rightarrow P(A \cap B) = \frac{1}{3} + \frac{1}{4} - \frac{1}{2}$
$= \frac{4 + 3 - 6}{12} = \frac{1}{12}$
Now,

$P(\frac{A}{B}) = \frac{P(A \cap B)}{P(B)} = \frac{1}{12} \times \frac{4}{1} = \frac{1}{3}$

Sol.17.(d) Total number of red and black colour card = 26 and 26
Total numbers of card = 52
Case (i)
One card is black and another is red = $\frac{26}{52}$
Case (ii)
One card is red and another is black = $\frac{26}{51}$
The probability that out of 2 cards, one card is red and one card is black
= 2 × $\frac{26}{52}$ × $\frac{26}{51}$ = $\frac{26}{51}$

Sol.18.(a) The word formed using A in 1st place = $1 \times 3! = 1 \times 6 = 6$
The 1st word formed using B in 1st place = BAER
The 2nd word formed using B in 2nd place = BARE
So the position of BARE = 6 + 2 = 8th

Sol.19.(c) Total 3 possible conditions when AB completely lies on one side of the circle and the points A and B being included.
So that , A/Q
Probability = $\frac{1}{3}$

Sol.20.(a) Total persons = 9, Men = 4
Formula
${}_nC_r = \frac{n!}{r!\,(n-r)!}$
Favorable outcomes = $4C_2 \times 5C_1$
$= 6 \times 5 = 30$
Total outcomes = $9C_3 = \frac{9 \times 8 \times 7}{1 \times 2 \times 3} = 84$
Required probability = $\frac{30}{84} = \frac{5}{14}$

Sol.21.(b) Total balls = 15
There are 10 black balls
probability that both drawn balls are black = $\frac{10}{15} \times \frac{9}{14} = \frac{3}{7}$

Sol.22.(c) Total numbers between 33 and 92 = (92 - 33) + 1 = 59 + 1 = 60
Total number of squares number = 4
Required probability = $\frac{4}{60} = \frac{1}{15}$

Sol.23.(c) Total number of cards after removing king and queen of black colour = 52 - 4 = 48
Remaining spade card = 13 - 2 = 11
Required probability = $\frac{11}{48}$

Sol.24.(c) Total numbers = 20
Multiple of 3 between 1 and 20 = 6
Multiple of 5 between 1 and 20 = 4
Common multiple of 3 and 5 = 1
Favorable outcomes = 6 + 4 - 1 = 9
Required probability = $\frac{9}{20}$

Sol.25.(d) As $10_{Pr} = 5040$
$\Rightarrow \frac{10!}{(10-r)!} = 5040$
$\Rightarrow (10 - r)! = 720$
Then the value of r = 4.

Sol.26.(a)
Total balls = 7 (2 red , 3 green and 2 blue)
If we draw 2 balls and want no blue ball, that means the balls drawn must be either red or green.
Favorable outcomes = $5C_2 = \frac{5 \times 4}{1 \times 2} = 10$
Total outcomes = $7C_2 = \frac{7 \times 6}{1 \times 2} = 21$
Required probability = $\frac{10}{21}$

Sol.27.(d) The total outcome = (1, 2, 3 ,4, 5)
Possible outcome to get odd on card
= (1, 3, 5) Probability = $\frac{3}{5}$

Sol.28.(b) Total two - digit no. = 90
Total prime number of two-digit = 21
(11, 13, 17 ,19 ,23 ,29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97)
Required probability → $\frac{(90-21)}{90} = \frac{23}{30}$

Sol.29.(c) Total outcome in single throw of three dice = (6 × 6 × 6) = 216
Total possible outcome sum of three number is ≥ 17
= (6, 6, 6), (6, 6, 5), (6, 5, 6), (5, 6, 6)
Probability
= $\frac{number\ of\ possible\ outcome}{total\ number\ of\ outcome}$
= $\frac{4}{216} \Rightarrow \frac{1}{54}$

Miscellaneous

Practice Questions

RRC Group D (17/08/2022 to 11/10/2022)

Q.1. Village A has a population of 72,000, which is decreasing at the rate of 1,000 per year. Village B has a population of 54,000, which is increasing at the rate of 800 per year. In how many years will the population of both the villages be the same ?
Group D 26/08/2022 (Morning)
(a) 12 (b) 15 (c) 10 (d) 7

Q.2. Which of the following relations would calculate the cost x of m notebooks, if the cost of n notebooks is ₹1,680.
Group D 29/08/2022 (Afternoon)
(a) $x = \frac{1680}{m}$ (b) $\frac{x}{m} = \frac{n}{m}$
(c) $\frac{m}{x} = \frac{1680}{n}$ (d) $\frac{m}{x} = \frac{n}{1680}$

Q.3. There are two classrooms A and B having a certain number of students. If 5 students are shifted from A to B, then B has twice the number of students as A. If 1 student is sent from B to A, then both classrooms will have the same number of students. How many students are there in A ?
Group D 30/08/2022 (Morning)
(a) 17 (b) 22 (c) 26 (d) 19

Q.4. The cost of 12 pens and 7 pencils is ₹233. If the cost of a pen decreases by ₹1.50 and the cost of a pencil increases by ₹1, then the cost of 2 pens and 3 pencils is ₹48. What is the original cost of 4 pens and 1 pencil ?
Group D 02/09/2022 (Morning)
(a) ₹71 (b) ₹78 (c) ₹77 (d) ₹74

Q.5. If a mixed recurring decimal $0.23\overline{45}$ is expressed as a fraction in its lowest terms, then its denominator exceeds its numerator by how much ?
Group D 06/09/2022 (Afternoon)
(a) 421 (b) 512 (c) 627 (d) 375

Q.6. Gopal went to a bank to withdraw ₹4,000. He asked the cashier to give the cash in ₹50 and ₹100 notes only. Gopal got 50 notes in all. How many ₹50 notes did he receive?
Group D 08/09/2022 (Morning)
(a) 24 (b) 32 (c) 20 (d) 30

Q.7. If consumption function = 50 + 0.6Y and Investment = 20, then find the equilibrium income.
Group D 15/09/2022 (Evening)
(a) 165 (b) 150 (c) 200 (d) 175

Q.8. A taxi charges a fixed charge of ₹40 and an additional charge per kilometre. A person pays ₹150 for 11 km of distance travelled. Find out the charges paid by Ramesh if he travelled for a distance of 20 km.
Group D 18/09/2022 (Morning)
(a) ₹230 (b) ₹260 (c) ₹250 (d) ₹240

Q.9. A has a certain amount of money and B also has some money. If A gives ₹130 to B, then B will have 1.5 times the amount left with A. Instead, if B gives ₹70 to A, then A will have 2 times the amount left with B. What is the total amount of money that A and B together have between them?
Group D 28/09/2022 (Evening)
(a) ₹720 (b) ₹750 (c) ₹700 (d) ₹780

Q.10. In a movie theater, the price of the ticket per kid is $2 while per adult it is $5. On a particular day, 2000 people bought tickets and an amount of $5,050 was collected. Find the number of $2 tickets sold on that day.
Group D 29/09/2022 (Evening)
(a) 1650 (b) 350 (c) 1560 (d) 1570

RRB NTPC CBT - 1 (28/12/2020 to 31/07/2021)

Q.11. A mango kept in a basket doubles every one minute. If the basket gets completely filled by mangoes in 30 min then in how many minutes half of the basket was filled?
RRB NTPC 04/01/2021 (Morning)
(a) 27 (b) 15 (c) 28 (d) 29

Q.12. Ram has a movie in his pen drive that takes 1.75 GB of space. He wants to share it with his friends. The speed of transferring the file is 2MBs. How much time will it take to transfer the file?
(1GB = 1000MB)
RRB NTPC 16/01/2021 (Morning)
(a) 14 min 34 s (b) 14 min 33 s
(c) 14 min 35 s (d) 14 min 36 s

Q.13. If $y = \frac{x}{(2+a)^2}$, then z = ?
RRB NTPC 29/01/2021 (Evening)
(a) $\frac{log_e(x-y)}{log_e(2+a)}$ (b) $\frac{log_e(\frac{x}{y})}{log_e(2-a)}$
(c) $\frac{log_e(\frac{y}{x})}{log_e(2+a)}$ (d) $\frac{log_e(\frac{x}{y})}{log_e(2+a)}$

Q.14. A beautician's income includes her salary and the tips she gets for her services. During a particular week, if her tips were $\frac{5}{4}$ of her salary, then what fraction of her income came from the tips ?
RRB NTPC 01/02/2021 (Morning)
(a) $\frac{9}{5}$ (b) $\frac{4}{9}$ (c) $\frac{5}{9}$ (d) $\frac{4}{5}$

Q.15. How will you write 9.08 hours in hours, minutes and seconds ?
RRB NTPC 01/02/2021 (Morning)
(a) 9 hours, 8 seconds
(b) 9 hours, 4 minutes, 48 seconds
(c) 9 hours, 10 minutes, 8 seconds
(d) 9 hours, 8 minutes

Q.16. A competitive exam is to be held on a particular day. The examiner who has to supervise the exam, enters the examination room 30 minutes before 2:30 hours. He came 40 minutes before the student who was 20 minutes late for the exam. At what time will the examination start ?
RRB NTPC 10/02/2021 (Morning)
(a) 2:40 hours (b) 2:20 hours
(c) 3:00 hours (d) 2:00 hours

Q.17. If the first term of a geometric progression is 2 and the common ratio is 3, then what will be the fifth term of the geometric progression?
RRB NTPC 22/02/2021 (Morning)
(a) 162 (b) 243 (c) 81 (d) 324

Q.18. When notebooks are distributed in a class, each child gets notebooks equivalent to one-eighth of the number of children in the class. If the number of children were halved, then each child would get 16 notebooks. How many notebooks are distributed in total ?
RRB NTPC 11/03/2021 (Evening)
(a) 512 (b) 452 (c) 632 (d) 256

Q.19. The electricity bill of an establishment is partly fixed and partly varies as per the number of units of electricity consumed. In a certain month, when 480 units were consumed, then the bill was Rs. 1,620. In another month, when 690 units were consumed, then the bill was Rs. 2,250. In the next month, if 500 units are consumed, then the bill for that month will be :
RRB NTPC 11/03/2021 (Evening)
(a) Rs. 1,560 (b) Rs. 1,840
(c) Rs. 1,680 (d) Rs. 1,950

Q.20. The price of commodity X increases by 40 paise every year, while the price of commodity Y increases by 25

paise every year. If, in the year 2002, the price of X was Rs. 5.20 and that of Y was Rs. 6.30, then in which year would commodity X cost 40 paise more than commodity Y ?
RRB NTPC 11/03/2021 (Evening)
(a) 2011 (b) 2010 (c) 2013 (d) 2012

Q.21. From certain number of apples, a man sells $\frac{1}{3}$of the apples to the first customer. He sells $\frac{1}{2}$of the remaining apples to the second customer, and $\frac{1}{3}$of the remaining apples plus 5 to the third customer. He then finds himself left with 3 apples. How many apples did the man have initially?
RRB NTPC 14/03/2021 (Evening)
(a) 24 (b) 30 (c) 36 (d) 18

Q.22. If the price of Bitcoin increases at the rate of one dollar every 20 seconds, then by how many dollars does the price of Bitcoin increase in half an hour?
RRB NTPC 01/04/2021 (Evening)
(a) $80 (b) $50 (c) $90 (d) $10

Q.23. There are 20 pigeons, 10 cows, 15 dogs and some buffalos. If the total number of feet is 125 more than the heads, then what is the number of buffalos?
RRB NTPC 03/04/2021 (Morning)
(a) 8 (b) 5 (c) 10 (d) 15

Q.24. What is the value of k in the following Arithmetic progression?
15 + 13 + 11 + 9 + ... + k = - 105
RRB NTPC 08/04/2021 (Evening)
(a) -21 (b) 7 (c) -25 (d) -5

Q.25. In a competition, two points are awarded for a win, one point for a draw, and no points for a loss. Fischer played 20 matches in which he drew three matches, lost at least one, and won at least one match. What will be his maximum and minimum possible marks respectively?
RRB NTPC 23/07/2021 (Morning)
(a) 25 and 15 (b) 40 and 0
(c) 35 and 5 (d) 33 and 8

Q.26. If 9 × log(x) = log (9) + log (27) + log (81), then x = ?
RRB NTPC 24/07/2021 (Morning)
(a) 4 (b) 2 (c) 1 (d) 3

Q.27. A certain number of women went to a hotel. Each woman spent as many rupees as one-fourth of the number of women. If the total bill paid was Rs. 20,449, then how many women visited the hotel?
RRB NTPC 31/07/2021 (Morning)
(a) 286 (b) 284 (c) 281 (d) 283

Q.28. Arun and Sekhar have certain amounts of money. If Arun gives Rs. 30 to Sekhar, then Sekhar will have twice the amount left with Arun. If Sekhar gives Rs. 10 to Arun, then Arun will have thrice as much as is left with Sekhar. What amount (in Rs.) does each of Arun and Shekhar respectively have in the beginning ?
RRB NTPC 31/07/2021 (Evening)
(a) 34, 62 (b) 56, 78 (c) 34, 72 (d) 62, 34

RRB JE (22/05/2019 to 28/06/2019)

Q.29. If A, B are two mutually exclusive events, then find P(AUB).
RRB JE 30/05/2019 (Evening)
(a) P(A) + P(B) (b) P(A) × P(B)
(c) P(A) + P(B) - P(A∩B) (d) 1 - P(A) - P(B)

Q.30. A boy was asked to write the value of $(2)^5 \times (8)^2$. He wrote it as 2582. Find the difference between the obtained and the actual value.
RRB JE 31/05/2019 (Evening)
(a) 189 (b) 0 (c) 37 (d) 534

RRB ALP Tier - 1 (09/08/2018 to 31/08/2018)

Q.31. The ratio of the numbers of blue to red balls in a bag is constant. When there were 44 red balls, the number of blue balls was 36. If the number of blue balls is 54, how many red balls will be in the bag?
RRB ALP 09/08/2018 (Morning)
(a) 62 (b) 68 (c) 66 (d) 64

Q.32. Which of the following statement is sufficient to answer the question?
Find the values of x, y, z from the given statements. Statements:
I : x + y = 12 ; x + z = 4
II : x - y = 6
RRB ALP 20/08/2018 (Evening)
(a) Only I is sufficient while II is not
(b) Both I and II are sufficient
(c) Only II is sufficient while I is not
(d) Neither I nor II is sufficient

Q.33. In the usual set notation,
A U (B∩C) =
RRB ALP 29/08/2018 (Afternoon)
(a) (AUB) ∩ (A∩C) = (b) (A∩B) U (A∩C) =
(c) (AUB) U (AUC) = (d) (AUB) ∩ (AUC) =

Q.34. When 472 pieces of plywood, each 0.23cm thick, are piled on top of each other, what would be the height of the pile in metre?
RRB ALP 29/08/2018 (Evening)
(a) 1.856 (b) 10.856 (c) 108.56 (d) 1.0856

Answer Key :-

1.(c)	2.(d)	3.(a)	4.(a)
5.(a)	6.(c)	7.(d)	8.(d)
9.(b)	10.(a)	11.(d)	12.(c)
13.(d)	14.(c)	15.(b)	16.(b)
17.(a)	18.(a)	19.(c)	20.(d)
21.(c)	22.(c)	23.(c)	24.(c)
25.(c)	26.(d)	27.(a)	28.(d)
29.(a)	30.(d)	31.(c)	32.(b)
33.(d)	34.(d)		

Solution :-

Sol.1.(c) let the time = T years
According to the question,
72000 - 1000 × T =54000 + 800 × T
⇒ 1800T = 18000
Therefore, T = 10 years

Sol.2.(d)
The Cost of n notebooks = ₹1680
The cost of 1 notebook = $\frac{1680}{n}$
The cost of m notebooks (x) = $\frac{1680}{n} \times m$
Hence only ,
option d satisfies $\frac{m}{x} = \frac{n}{1680}$

Sol.3.(a) Let class A has x students and class B has y students.
$2(x-5) = y+5 \Rightarrow 2x - y = 15$.....(1)
$x+1 = y-1 \Rightarrow x - y = -2$.....(2)
On solving eq .(1) and (2) , we get x = 17 and y = 19
Hence, there are 17 students in class A.

Sol.4.(a) Let the cost of 1 pen be ₹x and cost of 1 pencil be ₹ y
$12x + 7y = 233$.....(1)
$2(x-1.5) + 3(y+1) = 48$
$\Rightarrow 2x + 3y = 48$.....(2)
By solving eq .(1) and (2), we get x = ₹ 16.5 and y = ₹ 5
Hence, cost of 4 pens and 1 pencil
= (4 × 16.5 + 5) = 66 + 5 = ₹ 71

Sol.5.(a)
$0.2\overline{345} \Rightarrow \frac{2345-23}{9900} \Rightarrow \frac{2322}{9900} \Rightarrow \frac{129}{550}$
Required value = 550 - 129 = 421

Sol.6.(c)
Let the number of notes of 50 = x
ATQ,

50 × x + 100 (50 - x) = 4000
50x + 5000 - 100x = 4000
So, 50x = 1000 ⇒ Therefore x = 20

Sol.7.(d)
Equilibrium income: Y = C + I
Y = Equilibrium income, C= Consumption, I = Investment
Y = 50 + 0.6y + 20 ⇒ Y - 0.6Y = 70
0.4Y = 70 ⇒ Y = $\frac{70}{0.4}$ × 10 ⇒ Y = 175.

Sol.8.(d) Fixed charge of the taxi = ₹40
Fixed and additional charge for 11 km = ₹150
Additional charge per km = $\frac{150-40}{11}$
$= ₹10$. Now, total charge to travel a distance of 20 km = (20 × 10) + 40
= ₹240

Sol.9.(b) Let the A has x and B has y amount of money
ATQ,
$\frac{x-130}{y+130} = \frac{2}{3}$ ⇒ 3x - 390 = 2y + 260
⇒ 3x - 2y = 650 ..... (1)
$\frac{x+70}{y-70} = \frac{2}{1}$ ⇒x + 70 = 2y - 140
⇒ x - 2y = - 210 .... (2)
By subtracting equation (2) from (1)
X = 430 and y = 320
Therefore , x + y = ₹750

Sol.10.(a) Let the number of adults = x
And the number of kids = 2000 − x
According to the question,
5x + 2(2000 − x) = 5050
5x + 4000 − 2x = 5050
3x = 1050 ⇒ x = 350
So, number of $2 tickets = 2000 - 350
= 1650

Sol.11.(d) In every minute mangoes in the basket get doubled, so in the last minute that is in the 30th minute, it is also doubled and filled completely, which means up to 29 minutes, the basket is half filled.

Sol.12.(c) Time = $\frac{1.75 \times 1000}{2}$
= 875 seconds = 14 min 35 sec.

Sol.13.(d) $y = \frac{x}{(2+a)^z}$
Taking log both sides, we get
log y = log($\frac{x}{(2+a)^z}$)
$\Rightarrow log\, y = log\, x - log(2+a)^z$
$\Rightarrow log(2+a)^z = log(\frac{x}{y})$
$\Rightarrow z\ log(2+a) = log(\frac{x}{y})$
$\Rightarrow z = \frac{log(\frac{x}{y})}{log(2+a)}$

Sol.14.(c)
Let, the salary = x Rs, then tip = $(\frac{5}{4}x)$
Total income = $(x + \frac{5}{4}x) = (\frac{9}{4}x)$
So that , required fraction
= $(\frac{5}{4}x \times \frac{4}{9X}) = \frac{5}{9}$

Sol.15.(b) 9.08 hours in hours = 9 hours + 0.08 hours = 9 hours 4 min 48 sec.
Where - 60 min. = 1 hours ,
60 sec.= 1 min.

Sol.16.(b) Examiner enters the classroom = 2 : 30 hours - 30 min = 2 : 00 hours
Exam starting time = 2 : 00 hours + [40 min. - 20 min.] = 2:20 hours

Sol.17.(a) 5th term of the GP
= $ar^{n-1} = 2 \times 3^4 = 2 \times 81 = 162$

Sol.18.(a) Let , number of the children = n
Then , number of the notebook each child will get = $\frac{n}{8}$
Total book distributed = n × $\frac{n}{8}$
= $\frac{n^2}{8}$ ------ (i)
If the number children = $\frac{n}{2}$
Number of notebook each child will get = 16
Total notebook distributed = $\frac{n}{2} \times 16$ = 8n
Hence , $\frac{n^2}{8}$ = 8n ⇒ n = 64
Putting the value of " n " in equation (i)
Total book distributed = n × $\frac{n}{8} = \frac{n^2}{8}$ = 512

Sol.19.(c) Let, the fixed amount be = a Rs
The cost of each unit = b Rs
Then , 480b + a = 1620 ------ (i)
690b + a = 2250 ----- (ii)
On subtracting (i) & (ii) ,
we get , 210b = 630 ⇒ b = 3
Putting b = 3 in equation (i)
480 × 3 + a = 1620 ⇒a = 180
Hence , the fixed charges = 180 Rs.
charge per unit = 3 Rs.
Total charges for consuming 500 unit = (180 + 500 × 3) = 1680 Rs

Sol.20.(d)
Let the number of years = n years
Rs 5.20 = 520 paise
A/Q,
520 + n × 40 - 630 - n × 25 = 40
15 n - 110 = 40
15 n = 150 ⇒ n = 10 years
Required year = 2002 + 10 = 2012

Sol.21.(c)
Let the initial number of apples = x
1st customer = $\frac{x}{3}$, remaining = $\frac{2x}{3}$
2nd customer = $\frac{1}{2} \times \frac{2x}{3} = \frac{x}{3}$,
Remaining = $\frac{x}{3}$
3rd customer = $\frac{1}{3} \times \frac{x}{3}$ + 5 = $\frac{x}{9}$ + 5
Remaining = $\frac{x}{3} - \frac{x}{9} - 5 = \frac{2x}{9} - 5$
A/Q; $\frac{2x}{9} - 5 = 3 \Rightarrow \frac{x}{9} = 4 \Rightarrow x = 36$

Sol.22.(c) In 20 second bitcoin increases one dollar.
30 min = 30 × 60 = 1800 sec.
20 sec ⇢ 1 dollar
1 sec ⇢ $\frac{1}{20}$ dollar
1800 sec. ⇢ $\frac{1800 \times 1}{20}$ = 90 dollar

Sol.23.(c)
Heads of pigeon = 20 and legs = 40
Heads of cows = 10 and legs = 40
Heads of dogs = 15 and legs = 60
And heads of buffalos = x and legs = 4x
Total heads = 45 + x and legs = 140 + 4x
According to the question ;
45 + x + 125 = 140 + 4x
170 + x = 140 + 4x ⇒ x = 10

Sol.24.(c) First term (a) = 15
Common difference (d) = 13 - 15 = - 2
15 + 13 + 11 + 9 + ... + k= -105
$\Rightarrow \frac{n}{2}\{2a + (n-1)d\} = -105$
$\Rightarrow \frac{n}{2}\{30 + (n-1)(-2)\} = -105$
$\Rightarrow \frac{n}{2}\{32 - 2n\} = -105$
$\Rightarrow 16n - n^2 = -105$
$\Rightarrow n(n-16) = 105$
$\Rightarrow n(n-16) = 21 \times 5$
On comparing we get
n = 21
Now,
k = last term = 15 + 20 × (− 2)
k = 15 - 40 = - 25

Sol.25.(c) Maximum points = 16 win + 3 draw +1 lost = 32 + 3 = 35 points
Minimum points = 1 win + 3 draw + 16 lost = 2 + 3 = 5 points

Sol.26.(d)
9 × log(X) = log (9) + log (27) + log (81)
9 × log(X) = log (3^2) + log (3^3) + log (3^4)
9 log (X) = 9 log (3)

Hence , we can say that , X = 3

Sol.27.(a) Let the number of women = x

Each women spent = $\frac{x}{4}$

Bill = no. of women × money spent by each women

$\Rightarrow x \times \frac{x}{4} = 20,449$

$\Rightarrow x^2 = 81796 \Rightarrow x = 286$

Sol.28.(d) Let Arun and Sekhar have Rs.x and y respectively.

A/Q,

2(x - 30) = y + 30

$\Rightarrow 2x - 60 = y + 30$

$\Rightarrow 2x - y = 90$ --------- (1)

And,

$x + 10 = 3(y - 10)$

$\Rightarrow x - 3y = -40$ ----------(2)

On solving equation (1) and (2), we get

$x = 62 \; and \; y = 34$

Sol.29.(a) If A and B are two mutually exclusive event then there is no common element so(A∩B) is zero

P(AUB) = P(A) + P(B) − P(A∩B)

P(AUB) = P(A) + P(B)

Sol.30.(d) Actual value is $2^5 \times 8^2$ = 2048, Obtained value is 2582 their difference is 534

Sol.31.(c) Ratio of the no of blue balls to red balls = 36 : 44 = 9 : 11

No of red balls = $\frac{54}{9}$ × 11 = 66

Sol.32.(b) From statement I,

x + y = 12 --------- (1)

x + z = 4 --------- (2)

From statement II,

x - y = 6 --------- (3)

On combining statement I and III,

we get x = 9 and y = 3

(adding eqn.1 and 3

Putting x = 9 in eqn(2) we have : z = -5

Clearly, we can see that Both I and II are sufficient.

Sol.33.(d) (AUB) ∩ (AUC) =

Sol.34.(d) The height of the pile

= $\frac{0.23}{100}$ × 472 = $\frac{108.56}{100}$ = 1.0856 m