

General Properties of Matter

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Practice Problems with Solution

Question 1: The boiling point of water decreases at higher altitudes due to _____

- A: low temperature
- B: low atmospheric pressure
- C: high temperature
- D: high atmospheric pressure

Question 2: The shape of a rain drop is spherical due to _____

- A: viscosity
- B: surface tension
- C: elasticity
- D: gravitation

Question 3: The wall of a dam is made thicker at the bottom than at the top because the pressure exerted by the water on the wall _____

- A: depends on the thickness of the wall
- B: increases with height of the wall
- C: increases with depth of the wall
- D: depends on the area of the wall

Question 4: Materials for water proof coats and tents owe their water proofing properties to _____

- A: surface tension
- B: viscosity
- C: specific gravity
- D: elasticity

Question 5: The oil in the wick of an oil lamp rises up due to _____

- A: capillary action
- B: low viscosity of oil
- C: gravitational force
- D: pressure difference

Question 6: Shock absorbers are usually made of steel because _____

- A: it is not brittle
- B: it has lower elasticity
- C: it has higher elasticity
- D: it has no ductile property

Question 7: Hydraulic machines work under the principle of _____

- A: Newton's Law
- B: Joule's Law
- C: Pascal's Law
- D: Floatation Law

Question 8: When a ship enters the sea from a river _____

- A: it rises a little
- B: it sinks a little
- C: it remains at the same level
- D: it rises or sinks depending on the material it is made of

Question 9: The swing of a cricket ball in air can be explained by _____

- A: asymmetrical air flow on either side of the ball
- B: buoyancy of air
- C: turbulence caused by wind
- D: humidity level in the cricket ground

Question 10: Ventilators are provided near the ceiling of the rooms because _____

- A: the exhaled warmer air rises up and goes out
- B: these provide cross ventilation in the room
- C: temperature in the ceiling of the room is higher than at the floor level
- D: buoyancy of air increases with altitude

Answers and Solutions

1:- B

Solution: Higher altitudes have lower atmospheric pressure as the pressure of air decreases with altitude. Water boils when the vapour pressure of water becomes equal to the atmospheric pressure. As atmospheric pressure is low at higher altitudes, water boils at lower temperatures.

2:- B

Solution: The principle of surface tension induces matter to minimise its shape and rain drops are spherical because it has minimum surface area for a given volume.

3:- C

Solution: The pressure exerted by the water on the wall increases with the depth of the wall and the higher water pressure on the base of the dam needs greater strength to hold it back.

4:- A

Solution: The water proof property of the materials is due to surface tension. It makes the surface of a liquid to behave like an elastic membrane and therefore has a tendency to contract.

5:- A

Solution: Capillary rise or capillarity is a phenomenon in which liquid spontaneously rises or falls in a narrow space such as a thin tube or in the voids of a porous material. Surface tension is an important factor in the phenomenon of capillarity.

6:- C

Solution: The property of a body to regain its original size and shape after the removal of a deforming force is called elasticity. Shock absorbers are usually made of steel because it has higher elasticity.

7:- C

Solution: Hydraulic machines work under the principle of Pascal's Law which states that pressure applied to an enclosed fluid will be transmitted without a change in magnitude to every point of the fluid and to the walls of the container. The pressure at any point in the fluid is equal in all directions.

8:- A

Solution: The density of the sea water is high due to the impurities and salts dissolved in it and this causes an upward thrust on the ship which is more than that of river water and hence it rises a little.

9:- A

Solution: The swing of a cricket ball is based on Bernoulli's Principle. The swing occurs due to the pressure difference between the two sides of the ball while it is in air.

The swing of the cricket ball is ultimately caused by asymmetrical air flow over either side of the ball which causes a net side wards force to act on the ball. The asymmetry of the airflow can be enhanced by increasing the speed of the ball, the roughness of the ball and the seam position of the ball.

10:- A

Solution: Warmer air inside the room has a lower density than the cool air outside and hence it rises up to the ceiling and goes out through the ventilators. The lighter warm air is replaced by denser cool air.

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