



**DELHI PUBLIC SCHOOL NEWTOWN**  
**SESSION 2022-23**  
**MONDAY TEST**

**CLASS: IX**  
**SUBJECT: PHYSICS**

**FULL MARKS: 40**  
**TIME: 21.11.2022**

**Instructions:**

- All questions are compulsory.
- This paper consists of two printed pages.
- Answers to sub parts of the same question must be given in one place only.

**SECTION A**  
*(Attempt all questions.)*

**Question 1**

Choose the correct answers to the questions from the given options. [1 × 7 = 7]

- (a) A balloon filled with helium gas floats in a big closed jar which is connected to an evacuation pump. The balloon will sink when the air is pumped out. The appropriate reason for this is:
- (i) Density of air in jar decreases, so the upthrust on balloon decreases
  - (ii) Density of air in jar increases, so the upthrust on balloon increases
  - (iii) Upthrust exceeds the weight of the balloon
  - (iv) Both (i) and (iii)
- (b) A piece of wood of R.D. 0.25 floats in a pail containing oil of R.D of 0.81. The fraction of volume of the wood above the surface of the oil is
- (i) 0.31
  - (ii) 0.69
  - (iii) 0.21
  - (iv) 0.79
- (c) Which one of the following is odd?
- (i) silica below  $-80^{\circ}\text{C}$
  - (ii) silver iodide from  $80^{\circ}\text{C}$  to  $141^{\circ}\text{C}$
  - (iii) water from  $0^{\circ}\text{C}$  to  $4^{\circ}\text{C}$
  - (iv) silica above  $-80^{\circ}\text{C}$
- (d) A block of wood just floats when put in water at room temperature. What change will you observe if the water is heated?
- (i) floats more than before
  - (ii) sinks
  - (iii) first sinks then float
  - (iv) no change
- (e) If an object of mass 100 kg with a volume of  $1\text{m}^3$  is completely submerged 2 metre below the surface of water. What is the net force acting on the object? [ $g = 9.8\text{ms}^{-2}$ ]
- (i) 9460 N
  - (ii) 6440 N
  - (iii) 10200 N
  - (iv) 8820 N

- (f) An object of weight 200 N is floating in a liquid. What is the magnitude of the buoyant force acting on it?
- zero
  - more than 200N
  - 200N
  - less than 200 N
- (g) A body of mass 100 kg and density  $500 \text{ kg/m}^3$  floats in water. The mass that needs to be added to allow the body to sink is
- 80kg
  - 100kg
  - 150 kg
  - 200 kg

### Question 2

- i) Name the specific reaction that is maintained in any nuclear power plant.  
ii) How is the reaction stated above controlled?  
iii) Write one limitation of using nuclear energy. [3]
- What is global warming? [2]
- Why does a block of wood held under water rise to the surface when released? [2]
- Distinguish between density and relative density. [2]
- State the principle of a solar power plant. [2]
- State the principle of floatation. What is the purpose of the Plimsoll line on a ship? [2]

### SECTION B

Answer all questions

### Question 3

[3+3+4]

- "A balloon filled with hydrogen gas rises to a certain height and then stops rising further". Explain. How are the centre of gravity of a floating object and centre of buoyancy located with respect to each other, for an object floating partially in a fluid?
- A sample of milk diluted with water has a density of  $1060 \text{ kgm}^{-3}$ . If pure milk has a density of  $1080 \text{ kg m}^{-3}$  then find the percentage of water by volume in milk.
- Draw the graphs showing the variation
  - of density with temperature in range of  $0^\circ\text{C}$  to  $8^\circ\text{C}$  of water
  - of temperature with time recorded by the lower thermometer in Hope's experiment.

### Question 4

[3+3+4]

- State two limitations of establishing a solar panel. Mention one technological measure to minimize global warming.
- Write any two qualifying characteristics of a source of energy. Distinguish between renewable and non-renewable sources of energy. [any one]
- A solid block weighs 80.3 gf in air, 72.7 gf in water and 70.8 gf in a liquid. Find the relative density of the liquid. What is the relative density of the solid?