DELHI PUBLIC SCHOOL NEWTOWN
SESSION 2024-25
MONDAY TEST

CLASS: IX **FULL MARKS: 40**
SUBJECT: PHYSICS **TIME: 18.10.24**

Instructions:

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

SECTION A

(Attempt all questions.)

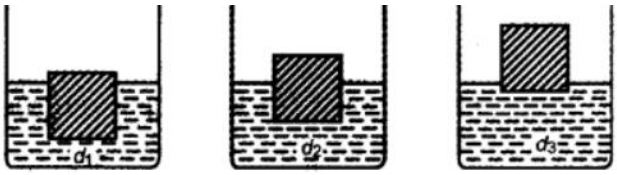
Question 1

Choose the correct answers to the questions from the given options. [1 × 8 = 8]

(i) A body floats in a liquid A of density d totally submerged inside the liquid and in liquid B of density D with a part of it submerged inside liquid. The densities D and d are related as

(a) d<D (b) d=D (c) D<d (d) both (a) and (b)

(ii) The following diagram shows three identical blocks of different materials are floating in same liquids. Which one is incorrect for the bodies?



(a) each has different density **(b) each experiences different upthrust**
(c) each has different weight **(d) net force acting on each is different**

(iii) A block of wood floats in water with 60% of its volume submerged. What is the relative density of the wood?

(a) 0.4 (b) 0.6 (c) 1 (d) 1.2

(iv) Statement-1: A gas filled balloon stops rising after it has attained a certain height in the sky.
Statement-2: At the highest point the density of air is such that the buoyant force on a balloon just equals its weight.

(a) Statement-1, is true, Statement-2 is true, Statement-2 is correct explanation for statement-1
(b) Statement-1 is true, statement-2 is true, statement-2 is NOT a correct explanation for statement-1
(c) statement-1 is true, statement-2 is false

(d) statement-1 is false statement-2 is true

(v) Which one of the following doesn't show anomalous expansion?

(a) silver iodide from 80°C to 141°C **(b) silica below −80°C**

(c) silica above 80°C **(d) water from 0°C to 4°C**

(vi) A block of wood just floats in water when put in water at room temperature. What change would you observe if the water is cooled?

(a) floats more than before (b) sinks (c) floats less than before (d) no change

(vii) Which material is commonly used in the construction of solar cells?

(a) silicon (b) aluminium (c) gallium (d) both a and c

(viii) An object of weight 135 N is floating in a liquid. What is the magnitude of the buoyant force acting on it?

(a) zero (b) >135 N (c) 135 N (d) <135 N

Question 2

(i)

(a) The level of water _____ (decreases/does not change /increases) when a piece of ice floating on it melts. [3]

(b) The common factor for nuclear fission and fusion to happen is_____ (high pressure/loss of mass/high temperature)

(c) The upthrust on an object_____(increases/decreases/remains same) when it is immersed deeper in the liquid.

(ii) (a) Name the specific reaction that is maintained in any nuclear power plant. [2]

(b) How is the reaction stated above controlled?

Question 3 [3]

(i) In a lab, John tried to demonstrate Hope's experiment. The room temperature was 15°C. He used a tall cylindrical vessel filled with water, placing thermometers at the top and bottom. A cooling jacket made of ice is wrapped around the middle section to lower the temperature.

(a) Which thermometer will show a rapid decrease in temperature in the beginning?

(b) Draw a graph to show the variation of temperature vs time recorded by the upper thermometer.

(c) Which natural property does the results of the experiment establish?

(ii)(a) Write any two characteristics of a good source of energy. [2]

(b) What would happen in the absence of greenhouse gases? Mention one technological measure to minimize global warming. [2]

SECTION B

Answer *all* questions

Question 4 [3+3+4]

(i)Distinguish between density and relative density. Name the principle that is used to

find the relative density of a liquid.

(ii) A block of solid having density 0.8 g/cm^3 floats in water keeping its 12 cm inside the water. Find the length of the side of the block. How much will it submerge in length if it is placed in a liquid of density 1.6 g/cm^3.

(iii)(a) Draw the graphs showing the variation of density versus temperature in the range of 0°C to 10°C of water. Mark density at 4°C.

(b) State two ways by which conductivity of a semiconductor can be increased.

Question 5 **[3+3+4]**

(i) (a) Write one advantage of nuclear energy and one limitation of wind energy.

(b) State the energy change in solar power plants.

(ii) A ship begins to submerge more as it sails from sea water to river water. Explain why? Name the law that can be used to explain the situation.

(iii) A stone weighs 200 gf in air and 120 gf when fully immersed in water. Calculate the volume and relative density of the stone. If the stone is put in a liquid of relative density 1.2, find the weight of the body in the liquid. What assumption is made here?