DELHI PUBLIC SCHOOL NEWTOWN
SESSION 2023-24
MONDAY TEST

CLASS: IX **FULL MARKS: 40**
SUBJECT: PHYSICS **DATE: 18.10.2023**

General Instructions:

- **This paper consists of three printed pages.**
- **All questions are compulsory.**
- **Copy the question number carefully before answering the questions.**

SECTION A
(Attempt all questions.)

1. **[1×7=7]**

(i) Which one of the following statements is incorrect?
(a) A hot body has more internal energy than an identical cold body.
(b) Liquids expand more than solids.
(c) Temperature alone indicates the quantity of heat energy contained in a body.
(d) Two bodies with same quantity of heat may differ in their temperatures.

(ii) Assertion(A) : An object floats if it displaces an amount of liquid whose weight is greater than its weight in air.
Reason(R) : During floatation an object experiences no net force in the downward direction
(a) Both A and R, are true and R is the correct explanation of A.
(b) Both A and R, are true but R is not the correct explanation of A.
(c) A is true but R is false
(d) A is false but R is true

(iii) The temperature on Celsius scale and Kelvin scale.
(a) T K = 0 + t^0 C (b) T K = 273 - t^0 C (c) T K = 212 + t^0 C (d) T K = 273 + t° C

(iv) We plot a graph, having temperature in °C on X-axis and in °F on Y-axis. If the graph is straight line, then it:
(a) passes through origin **(b) intercepts the positive X- axis**
(c) intercepts the positive Y- axis **(d) remain parallel to the X- axis**

(v) A beaker is completely filled with water at 4°C. Water will overflow if
(a) Heated above 4°C **(b) Cooled below 4°C**
(c) Both heated and cooled above and below 4°C **(d) None of the above**

(vi) The gas that doesn't produce greenhouse effect

(a) carbon dioxide (b) chlorine (c) methane (d) nitrous oxide

(vii) A solid of density ρ_s is partially floating in a liquid of density ρ_L. Select the correct option.

a) Centre of gravity will be located vertically higher the centre of buoyancy.

b) Centre of gravity will be located vertically lower the centre of buoyancy.

c) Centre of gravity and centre of buoyancy will be located at the same height but won't coincide.

d) Centre of gravity and centre of buoyancy will coincide.

SECTION B

(Attempt all questions.)

Question 2 **[3+2+2+2+2+2]**

i) a) What do you mean by the term relative density of an object?

b) Mention the relation between density and relative density in SI unit.

c) State the energy transformation in a hydroelectric power plant.

ii) A fresh egg sinks in pure water but floats in saline water. Give reason.

iii) a) What type of expansion (amongst the usual three types) does a fluid undergo?

b) Arrange the extent of expansion for solids, liquids and gases in descending order.

iv) State any two technological measures to minimise the impact of global warming.

v) Why does a ship submerge less when it sails from river water to sea water?

vi) Why does A good swimmer inhale sufficient quantity of air before attempting to go inside the water.

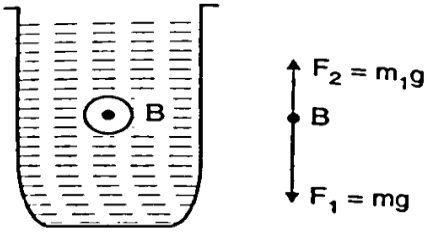
Question 3 **[3+3+4]**

i) (a) State the two laws of thermodynamics related to energy flow.

(b) State one disadvantage of using nuclear energy for producing electricity.

ii) A metal cube of side 5 cm and relative density 9, is suspended by a thread so that it is completely immersed in a liquid of relative density 1.2. Find the tension in the thread.

iii) A small stone of mass 200 g and volume 80 cm^3 is held underwater in a tall jar and is allowed to fall as shown in the diagram below. The forces acting on stone are also shown.



a) What does m_1 represent?

b) What is the acceleration of the stone as it falls through water? [g = 10 ms^{-2}].

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

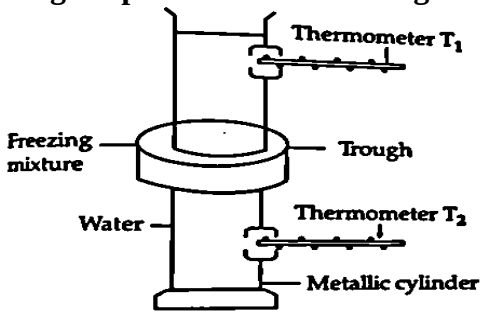
i) Tina's father is marine engineer by profession. Once her father took her to Khidirpur dockyard to show her the cargo ships. Tina saw a reference mark painted on the hull of the ship. She also observed that when the ships are unloaded, they are filled by sand.

a) What are the lines mentioned above called?

b) Why are the ships filled with sand on unloading?

ii) A hollow cylinder of length 20 cm is floating in alcohol of density 0.80 g/cm^3, with 2 cm of it above the surface of liquid. What length of the cylinder will be above the surface of a solution of density 1.25 g/cm^3?

iii) The diagram below shows Hope's experimental setup. The temperature in the metallic cylinder is 10°C. The trough is packed with a freezing mixture of ice and salt



a) Which of the two thermometers shows rapid fall in temperature initially? Justify your answer.

b) After some time when ice is found to be formed. Will the ice sink to the bottom of the metallic cylinder? Give reason to support your answer.