NUMERICAL

1. The mass of 10 cm^3 of silver is 103 gm. Find,
(a) The density of silver in kg/m^3.
(b) Relative density of silver.

Mass = 103 g and Volume = 10 cm^3.

(a) Density = Mass/volume = $\dfrac{103 g}{10 \text{ cm}^3}$ = 10.3 g cm^{-3}.

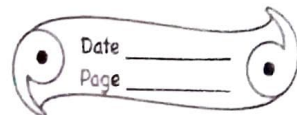$$= 10.3 \times 1000 \text{ Kg m}^{-3}$$
$$= 10300 \text{ kg m}^{-3}.$$

(b) Relative density of silver = $\dfrac{\text{Density of silver}}{\text{Density of water}}$

$$= \dfrac{10300 \text{ kg m}^{-3}}{1000 \text{ Kg m}^{-3}} = 10.3$$

(2) A piece of wood of mass 150 g has a volume of 200 cm^3. Find the density of wood in C.G.S unit and S.I unit.

Density = $\dfrac{\text{Mass}}{\text{Volume}}$ = $\dfrac{150 g}{200 \text{ cm}^3}$ = 0.75 g cm^{-3}.

CGS unit = 0.75 g cm^{-3}.

S.I = $\dfrac{150}{200} \times \dfrac{1}{\dfrac{1000}{\left(\frac{1}{10}\right)^3}}$ = $\dfrac{150 \times 100\,0000}{200 \times 1000}$ = 750 Kg m^{-3}.

3. How does the density of a liquid (or gas) vary with temperature?

When the temperature increases, the volume increases and hence the density decreases.

4. Define the term relative density of a substance.

or relative density of a substance is the ratio of the density of the substance to the density of water.

what is the unit of relative density?

The relative density is just a number. It has no unit as it is a ratio of same quantities.

5. How does the density of a body and that of a liquid determine whether the body will float or sink into that liquid?

If the density of the body is more than the density of liquid, the body sinks. If the density of the body is equal to or less than the density of liquid, the body floats.

6. What is the law of floatation?

Law of floatation is a law which states that the weight of a floating body is equal to the

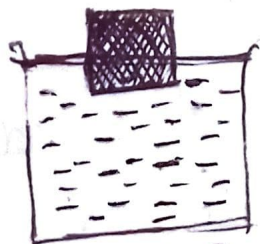weight of the liquid displaced by its submerged part. (i.e., buoyant force on it).

Numerical

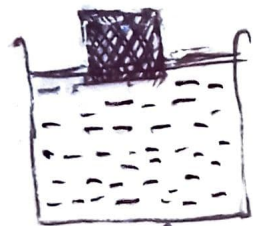The diagram given below shows a body floating in three different liquids A, B and C at different levels.

(a) In which liquid does the body experience the greatest buoyant force?

(b) Which liquid has the least density?

(c) Which liquid has the highest density?
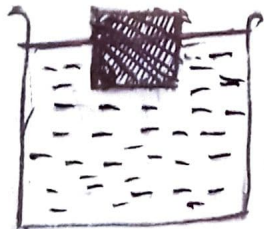
Liquid A   Liquid B   Liquid C

(a) The buoyant force is same in every liquid.

(b) Liquid A has the Least Density.

(c) Liquid C has the highest Density.