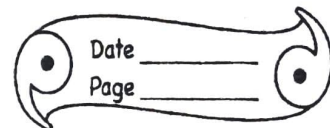# Home Assignment

1) The density of alcohol is $600 \text{ kg}/m^{-3}$. Express it in $g\text{ cm}^{-3}$

Sol:

Density of alcohol $= 600 \text{ kg}/m^{-3}$

$1 \text{ kg}/m^{-3} = \dfrac{1}{1000} g\text{ cm}^{-3}$

$600 \text{ kg}/m^{-3} = \dfrac{600}{1000} g\text{ cm}^{-3} = 0.60 \, g\text{ cm}^{-3}$

2) A piece of wood of mass 150g has a volume of 200 cm³. Find the density of wood in (a) C.G.S unit, (b) S.I unit.

Sol:

Mass of the wood $= 150g$
Volume of wood $= 200 \text{ cm}^3$

a) Density in C.G.S $= \dfrac{150}{200} g\text{ cm}^{-3} = 0.75 g\text{cm}^{-3}$

b) Density in S.I unit $= 0.75 g\text{ cm}^{-3} \times 1000$
$= 750 \text{ kg } m^{-3}$

3) Calculate the density of solid from the following data:
(a) Mass of solid $(M) = 72g$
(b) Initial volume of water in measuring

cylinder = 24ml

(c) Final volume of water when solid is completely immersed in water 42ml.

Sol:

Final volume = 42ml = 42 cm³

Initial volume = 24ml = 24cm³

Volume of solid = 42 − 24 = 18 cm³

$Density = \dfrac{M}{V} = \dfrac{72g}{18 cm^3} = 4 g cm^{-3}$

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

Ans- The density of a substance decreases with the increase in temperature and increases with the decrease in temperature. Exception is water which contracts on heating from 0°C to 4°C and expands on heating above 4°C. So the density of water increases from 0°C to 4°C and then decreases above 4°C.

5) What is a density bottle? How is it used to find the density of a liquid?

Ans- A density bottle is a specially designed bottle which is used to determine the density of a liquid. It is a small glass bottle having a glass stopper at its neck. The bottle can store a fixed volume of a liquid. Generally the volume of a liquid or bottle is 25ml or 50 ml. The stopper has a narrow hole through it. When the bottle is filled with the liquid and stopper is inserted, the excess liquid rises through the hole and drains out. Thus, the bottle always contains the same volume of liquid each time when it is filled.