

# Home Assignment

Pg-1

1. Ans. The density of a substance is defined as the mass of a unit volume of that substance.
2. Ans. The S.I unit of density is kilogram per cubic metre ( $\frac{\text{kg}}{\text{m}^3}$  or  $\text{kg m}^{-3}$ )

The CGS unit of density is gram per cubic centimetre ( $\frac{\text{g}}{\text{cm}^3}$  or  $\text{g cm}^{-3}$ )

$$1 \text{ kg} = 1000 \text{ g}$$

$$1 \text{ g} = \frac{1}{1000} \text{ kg}$$

$$1 \text{ m} = (100 \text{ cm})^3$$

$$= 100 \times 100 \times 100 \text{ cm}^3$$

$$= 1000000 \text{ cm}^3$$

$$\therefore 1 \text{ cm}^3 = \frac{1}{1000000} \text{ m}^3$$

$$1 \text{ g cm}^{-3} = \frac{1 \text{ g}}{1 \text{ cm}^3}$$

$$= \frac{\frac{1}{1000} \text{ kg}}{1 \text{ cm}^3}$$

$$= \frac{1}{1000000} \text{ kg m}^{-3}$$

$$= \frac{1000000}{1000} \text{ kg m}^{-3}$$

$$= 1000 \text{ kg m}^{-3}$$

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

3. Ans. The water contracts on heating from  $0^\circ\text{C}$  to  $4^\circ\text{C}$  and the density decreases from  $4^\circ\text{C}$  to  $0^\circ\text{C}$ . Thus, the density increases from  $0^\circ\text{C}$  to  $4^\circ\text{C}$ .

4. Ans. The density of water increases when heated but decreases when cooled.

5. Answer - Density (d) =  $\frac{\text{Mass (M)}}{\text{Volume (V)}}$

$$1 \text{ L} = 1000 \text{ cm}^3$$

$$5 \text{ L} = 5 \times 1000 = 5000 \text{ cm}^3$$

$$1 \text{ kg} = 1000 \text{ g}$$

$$5 \text{ kg} = 5 \times 1000 = 5000 \text{ g}$$

$$\text{Density of water in } \text{g cm}^{-3} = \frac{M}{V} = \frac{5000 \text{ g}}{5000 \text{ cm}^3} = 1 \text{ g cm}^{-3}$$

∴ the density of water is  $1 \text{ g cm}^{-3}$