

HW
2/9/21

HOME ASSIGNMENT

NUMERICAL

① The mass 10^3 of silver is 103 gm, Find -

- (a) The density of silver in kg/m^3 .
- (b) Relative density of silver.

Sol. → Relative density of silver = $\frac{\text{density of water}}{\text{density of silver}}$

⇒ Density of water = Relative

⇒ Density of silver × Density of water

⇒ $103 \times 10^{-3} \text{ kg m}^{-3}$

= 10800 kg m^{-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.

Sol. →

~~Density = Mass~~

Density = $\frac{\text{Mass}}{\text{Vol}^m} = \frac{150 \text{ g}}{200 \text{ cm}^3}$

Density (C.G.S) = 0.75 g/cm^3
unit

$$\text{SI unit} \Rightarrow \text{g/cm}^3 \Rightarrow \text{kg/m}^3$$

$$0.75 \text{ g/cm}^3$$

$$\Rightarrow \frac{0.75}{1000} \div 1000000 \text{ m}^3 \quad \begin{array}{l} 1000 \text{ g} = 1 \text{ kg} \\ = 0.75 \text{ kg} \\ \hline 1000 \end{array}$$

$$\Rightarrow 0.75 \times 1000$$

$$1 \text{ cm}^3 = \text{---} \text{ m}^3$$

$$\text{SI unit} \Rightarrow 750 \text{ kg/m}^3$$

$$1 \text{ cm} = \frac{1 \text{ m}}{100}$$

$$1 \text{ cm}^3 = \frac{1}{100} \times \frac{1}{100} \times \frac{1}{100}$$

$$= \frac{1}{1000000}$$

$$1000000$$

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

Ans) As the temperature increases, volume of most of the liquids also increases and when the volume increases, density decreases. Similarly, when temperature decreases, the volume of most liquids decreases which increases the density.

④ Define the term relative density of a substance. What is the unit of relative density?

Sol. → The relative density of a substance is defined as the ratio of the density of the substance to the density of water.

Relative density is just a number. It has no unit.

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

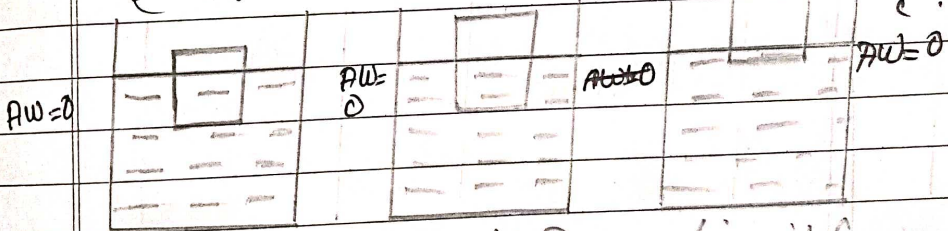
Sol. → If the density of a body is less than the density of liquid, whereas if the density of a body is more than the density of liquid the body will sink in liquid.

Q6) What is the law of floatation?

Ans → A body floats in a liquid if the weight of the body is equal to the weight of the liquid displaced it. It is the law of floatation.

Q7) The diagram given below shows a body floating in three different liquids A, B and C at different levels.

In all the cases W_t of solid = (Upthrust)



liquid A
(floating)

liquid B
(floating)

liquid C
(floating)

Q8) In which liquid does the body experience the greatest buoyant force?

Ans → Buoyant force is same in each case.

(a) Which liquid has the least density?

Sol. → liquid A has ^{the} least density.

(c) Which liquid has the highest density?

Sol. liquid C has the highest density.