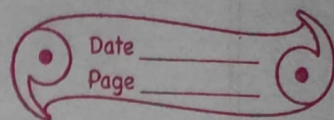


HCW

13-08-21

Assignment - 1



Physics

(1) Define the term density of a substance.

Ans- Density of a substance defined as the mass per unit volume of the material.

(2) Name the SI unit of density. how is it related to gcm^{-3}

Ans- The S.I unit of Kilogram per cubic metre (kg/m^3) and the cgs units of gram per cubic centimetre (g/cm^3) are probably the most commonly used units for density. One g/cm^3 is equal to 1000 kg/m^3 . One cubic cm (abbreviation cc) is equal to one millilitre.

(3) The density of brass is 8.4 gcm^{-3} . What do you mean by this statement?

Ans- This statement means one cubic centimetre volume of brass has mass of 8.4 g .

(4) Arrange the following substances in order of their increasing density:

Iron, cork, Brass, water, Mercury.

Ans- cork, water, iron, Brass, Mercury.

5. How does the density of a liquid or gas vary with temperature?

Ans. As the temperature increases, volumes 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.

6. A given quantity of liquid is heated. Which of the following quantity will vary and how?

Ans. Assuming no loss of quantity due to phenomenon such as evaporation, heating would keep the mass is the amount of matter contained in a body/object/system. The volume and density would depend on the coefficient of volumetric thermal expansion.

7. Describe an experiment to determine the density of the material of a coin.

Ans. → * An experiment to determine the density of the material of the coin has a basic requirement of knowing the material used in the coin. The density of a coin can be known easily by measuring the weight of the coin in the air and the weight of the coin displaced by the amount of water. Density is the ratio of mass to the volume.

- * Therefore, measure the weight of the coin in the air by a precision scale as M . Get a beaker full of water and weigh it. Now place the coin inside the water without touching any side of the beaker and weigh the displaced weight as V .
- * Now find out the ratio between the two and that will be the density of the material of the coin.

$$\text{Density} = \frac{M}{V}$$

8. Describe an experiment to determine the density of a liquid.

Ans. Take the measuring cylinder and measure its mass, in grams, as accurately as possible. Repeat the procedure, adding 10 ml at a time as accurately as possible and recording the volume and total mass, until the measuring cylinder is full. Then, for each volume calculate the mass of the liquid alone.

9. What is a density bottle? How is it used to find the density of a liquid?

Ans- Density bottles are mainly used to determine the density of liquids of moderate viscosity. They are not volumetric instruments, however they are calibrated 'to contain' as in the case of volumetric flasks. Determine the weight of the dry and empty density bottle. Fill the density bottle with liquid, avoiding bubbles.