

## 2. Fill in the blanks

(a)  $1 \text{ m}^3 = 10^6 \text{ cm}^3$

(b) The volume of an irregular solid is determined by the method of **displacement of liquid**.

(c) Volume of a cube = **(one side)**

(d) The area of an irregular lamina is measured by using a **graph paper**.

(e) Mass = density  $\times$  **volume**.

(f) The S.I. unit of density is  **$\text{kg m}^{-3}$** .

(g)  $1 \text{ g cm}^{-3} = 1000 \text{ kg m}^{-3}$ .

(h)  $36 \text{ km h}^{-1} = 10 \text{ ms}^{-1}$ .

(i) Distance travelled  $d =$  **speed  $v$**   $\times$  time  $t$ .

3. Match the following

**Column A**

- (a) Volume of a liquid
- (b) Area of a leaf
- (c) S.I. unit of volume
- (d) S.I. unit of density
- (e) S.I. unit of speed

**Column B**

- (i)  $\text{kg m}^{-3}$
- (ii)  $\text{m}^3$
- (iii) graph paper
- (iv)  $\text{m s}^{-1}$
- (v) measuring cylinder

**Ans.**

**Column A**

- (a) Volume of a liquid
- (b) Area of a leaf
- (c) S.I. unit of volume
- (d) S.I. unit of density
- (e) S.I. unit of speed

**Column B**

- (v) measuring cylinder
- (iii) graph paper
- (ii)  $\text{m}^3$
- (i)  $\text{kg m}^{-3}$
- (iv)  $\text{m s}^{-1}$

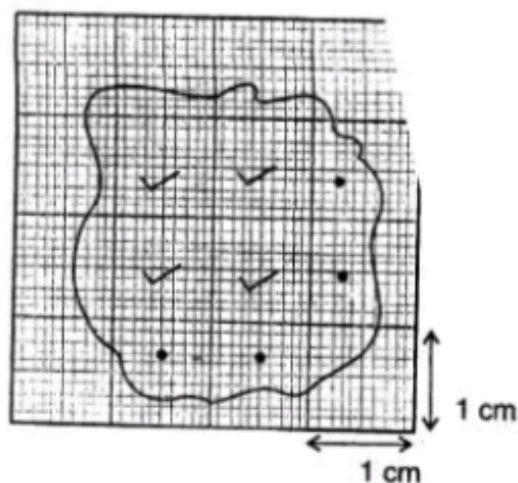
**Question 8.**

Describe the method in steps to find the area of an irregular lamina using a graph paper.

**Answer:**

Method to find the area of an irregular lamina using a graph paper : First, place the lamina over a graph paper and draw its boundary line on the graph paper with a pencil. Then remove the lamina and count and note the number of complete squares as well as the number of squares more than half within the boundary line (only the squares less than half, are left while counting). The area of lamina is equal to the sum of the area of complete squares and the area of squares more than half. Let  $n$  be the total number of complete and more than half or half squares within the boundary of lamina. Since area of one big square is  $1\text{ cm} \times 1\text{ cm} = 1\text{ cm}^2$ , so the area of lamina will be  $n \times$

$1\text{ cm}^2$  or  $n\text{ cm}^2$ ]

**Question 9.**

Define the term density of a substance.

**Answer:**

The density of a substance is defined as the mass of a unit volume of that substance.

**Question 10.**

State the S.I. and C.G.S. units of density. How are they inter related ?

**Answer:**

The S.I. unit of mass is kilogram (symbol kg) and of volume is cubic metre (symbol  $m^3$ ). Therefore S.I. unit of density is  $kg/m^3$  or  $kg\ m^{-3}$ .

The C.G.S. unit of mass is gram (symbol g) and of volume is cubic centimetre (symbol  $cm^3$ ). Therefore the C.G.S. unit of density is  $g/cm^3$  or  $g\ cm^{-3}$ .

**Relationship between  $kg\ m^{-3}$  and  $g\ cm^{-3}$** 

$$1\ kg = 1000\ g$$

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

$$\begin{aligned} \text{and } 1\ m^3 &= (100\ cm)^3 \\ &= 100 \times 100 \times 100\ cm^3 \\ &= 10,00,000\ cm^3 \end{aligned}$$

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

$$\begin{aligned} \text{Now } 1\ g\ cm^{-3} &= \frac{1\ g}{1\ cm^3} \\ &= \frac{\frac{1}{1000}\ kg}{\frac{1}{1000000}\ m^3} = \frac{1000000}{1000}\ kg\ m^{-3} \\ &= 1,000\ kg\ m^{-3} \end{aligned}$$

$$\text{Thus, } 1\ g\ cm^{-3} = 1,000\ kg\ m^{-3}$$

**Question 11.**

The density of brass is  $8.4\ g\ cm^{-3}$ . What do you mean by the statement ?

**Answer:**

Density of brass is  $8.4\ g\ cm^{-3}$ . This means that unit volume of brass contains  $8.4\ g$  mass.

**Question 12.**

Arrange the following substances in order of their increasing density:

- (a) iron
- (b) cork
- (c) brass
- (d) water
- (e) mercury

**Answer:**

$$b < a < c < d < e$$

**Question 13.**

How does the density of water changes when :

- (a) it is heated from 0°C to 4°C,
- (b) it is heated from 4°C to 10°C ?

**Answer:**

(a) Water contracts on heating from 0°C to 4°C and expands on heating above 4°C.

(b) The density of water is maximum at 4°C. It decreases when it is cooled from 4°C to 0°C or it is heated above 4°C.

**Question 14.**

Write the density of water at 4°C.

**Answer:**

The density of water at 4°C is 1.0 g cm<sup>-3</sup>, or 1,000 kg m<sup>-3</sup>

**Question 15.**

Explain the meaning of the term speed.

**Answer:**

The distance covered or travelled by a body in one second is called the speed of the body, i.e.

$$\text{Speed} = \frac{\text{Distance travelled}}{\text{Time taken}}$$

Speed is usually denoted by the symbol  $v$ .

If a body travels a distance  $d$  in time  $t$ , then its speed is given as

$$\text{Speed } (v) = \frac{d}{t}$$

**Question 16.**

Write the S.I. unit of speed.

**Answer:**

The S.I. unit of speed is metre/second or metre per second. Its symbol is m s<sup>-1</sup>.

**Question 17.**

A car travels with a speed 12 m s<sup>-1</sup>, while a scooter travels with a speed 36 km h<sup>-1</sup>. Which of the two travels faster ?

**Answer:**

Speed of car = 12 m s<sup>-1</sup>

Speed of scooter = 36 km h<sup>-1</sup>

here, 1 km = 1000 m

1 hr = 3600 sec

$$\therefore \text{Speed of scooter} = \frac{36 \times 1000}{3600} = 10 \text{ m s}^{-1}$$

$\therefore$  Speed of car is more. Car travels faster than scooter.