C. Numericals

Question 1.
The length, breadth and height of a water tank are 5 m, 2.5 m and 1.25 m respectively. Calculate the capacity of the water tank in (a) m^3 (b) litre.

Answer:
Given,
Length (1) = 5m
Breadth (b) = 2.5 m
and Height (h) = 1.25 m

(a) Volume of water tank in $m^3 = l \times b \times h$
$$= 5m \times 2.5 \text{ m} \times 1.25 \text{ m}$$
$$= 15.625 \text{ m}^3$$
(b) Volume of water tank in litre $= 15.625 \times 1000$
$$= 15625 \text{ litre}$$

Question 2.
A solid silver piece is immersed in water contained in a measuring cylinder. The level of water rises from 50 ml to 62 ml. Find the volume of silver piece.

Answer:
Given, initial level of water v_1 = 50 ml
Final level of water v_2 = 62 ml
Volume of silver piece V = $v_2 - v_1$
= 62 ml – 50 ml
= 12 ml or 12 cm^3

Question 3.
Find the volume of a liquid present in a dish of dimensions 10 cm x 10 cm x 5 cm.

Answer:
Volume of water = Length × breadth × height
= 10 cm × 10 cm × 5 cm
= 500 cm^3 or 500 ml.

Question 4.
A rectangular field is of length 60 m and breadth 35 m. Find the area of the field.

Answer:
Length of a rectangular field = 60 m
Breadth of rectangular field = 35 m
∴ Area = 60 m × 35 m
= 2100 m^2

Question 6.

A piece of brass of volume 30 cm^3 has a mass of 252 g. Find the density of brass in (i) g cm^{-3}, (ii) kg m^{-3}.

Answer:

Ans. Given, Mass $M = 252$ g

Volume $V = 30 \text{ cm}^3$

(i) Density $d = \dfrac{M}{V} = \dfrac{252}{30 \text{ cm}^3}$

$$= 8.4 \text{ g cm}^{-3}$$

(ii) Since, $M = 252 \text{ g} = 0.252 \text{ kg}$

$V = 30 \text{ cm}^3 = 30 \times 10^{-6} \text{ m}^3$

Density $d = \dfrac{0.252 \text{ kg}}{30 \times 10^{-6} \text{ m}^3} = \dfrac{0.252 \text{ kg}}{30 \times \dfrac{1}{1000000} \text{ m}^3}$

$$= \dfrac{0.252 \times 1000000 \text{ kg}}{30 \text{ m}^3} = \dfrac{25200}{3} \text{ kg m}^{-3}$$

$$= 8400 \text{ kg m}^{-3}$$

Question 7.

The mass of an iron ball is 312 g. The density of iron is 7.8 g cm^{-3}. Find the volume of the ball.

Answer:

Given, Mass $M = 312$ g

Density $d = 7.8 \text{ g cm}^{-3}$

Since, $d = \dfrac{M}{V} \Rightarrow V = \dfrac{M}{d}$

Hence, volume of an iron ball $V = \dfrac{312}{7.8} = 40 \text{ cm}^3$

Question 8.

A cork has a volume 25 cm^3. The density of cork is 0.25 g cm^{-3}. Find the mass of cork.

Answer:

Given, density $d = 0.25$ g cm^{-3}

$V = 25$ cm^3

From relation $d = \dfrac{M}{V}$ $\Rightarrow M = d \times V$

$$= 0.25 \times 25$$
$$= 6.25 \text{ g}$$

Question 9.

The mass of 5 litre of water is 5 kg. Find the density of water in g cm^{-3}.

Answer:

Given, Mass $M = 5$ kg $= 5000$ g

Volume $V = 5$ litre $= 5000$ cm^3

Density of water $d = \dfrac{M}{V}$

$$= \dfrac{5000 \text{ g}}{5000 \text{ cm}^3} = 1 \text{ g cm}^{-3}$$