$$1m^3 = 10^9\ mm^3$$

3- For measurement of volumes of liquids, we use the terms liters (l) and milliliters (ml).

$$1cm^3 = 1ml$$

$$1000cm^3 = 1l$$

and $$1m^3 = 1000000\ cm^3 = 1000\ l$$

$$1m^3 = 1kl\ (1\ \text{kiloliter})$$

Exercise 9.5

Find the Volume of the Solids

1. A cube of a side 4cm

Sol: A cube of a side = 4

Volume of cube = $(l)^3$

$= (4)^3$

$= 64$ cubic cm

2. A cube whose total area is $96cm^2$.

Total area of cube = 96

areas of cube = 6

area of 1 face $= \frac{96}{6}$

$= 16$ sq. cm

Length of edge = $\sqrt{16}$

$= 4$ cm

volume of cube $= (l)^3$

$= (4)^3$

$= 64\ cm^3$

3. A rectangular box with length $4m$ breadth $3m$ and height $2m$.

length of rectangular $= 4\ m$

Breadth of rectangular $= 3$ m

Height of rectangular $= 2$ m

volume of cuboid $= l \times b \times h$

$= 4 \times 3 \times 2$

$= 24\ (m)^3$

4. Right cylinder, with radius of base 4cm, altitude 10cm, use $\pi = \frac{22}{7}$.

Sol: Radius of base $= (r) = 4$ cm

altitude $= (h) = 10$ cm

volume of cylinder $= \pi r^2 h$

$= \frac{22}{7} \times (4)^2 (10)$

$= \frac{22}{7} \times 16 \times 10$

$= \frac{3520}{7}$

$= 502.86 \text{ cm}^3$

5. Circular cone, with radius of base 3cm, altitude 10cm.

Radius of circular base $= r = 3$ cm

Height of altitude $= h = 10$ cm

$$\text{Volume of circular cone} = \frac{1}{3}\pi r^2 h$$

$$= \frac{1}{3}\left(\frac{22}{7}\right)(3)^2(10)$$

$$= \frac{1}{3}\times\frac{22}{7}\times 3\times 3\times 10$$

$$= \frac{660}{7}$$

$$= 94.3 \text{ cm}^3$$

6. Sphere, with radius 3cm.

Radius of sphere $= r = 3$ cm

$$\text{Volume of sphere} = \frac{4}{3}\pi r^3$$

$$= \frac{4}{3}\times\frac{22}{7}\times(3)^3$$

$$= \frac{4}{3}\times\frac{22}{7}\times 3\times 3\times 3$$

$$= \frac{4\times 22\times 3\times 3}{7}$$

$$\text{Volume of sphere} = \frac{792}{7}$$

$$= 113.14 \text{ cm}^3$$

7. Right circular cylinder, with circumferences of base 4cm, altitude 1m

Sol. Circumference of base = 4cm

Circumference of base = $2\pi r$

then $2\pi r = 4$

$$r = \frac{4}{2\pi}$$

$$= \frac{2}{\pi} \text{ cm} \qquad \text{(i)}$$

Length of cylinder (h) = 1m

= 100 cm

Volume of cylinder = $\pi r^2 \times h$

from (i) $= \pi\left(\frac{2}{\pi}\right)^2 (100)$

$$= \pi \times \frac{2\times 2\times 100}{\pi \times \pi}$$

$$= \frac{7\times 2\times 2\times 100}{22}$$

$$= \frac{1400}{11}$$

$= 127.3\text{cm}^3$ approx

8. Cone with altitude 9cm, radius of base 6cm.

Sol: Cone with altitude = h = 9 cm

Cone with radius of base = r = 6 cm

Volume of cone = $\frac{1}{3}\pi r^2 \times h$

$$= \frac{1}{3}\left(\frac{22}{7}\right)(6)^2 \times 9$$

$$= \frac{1}{\cancel{3}} \times \frac{22}{7} \times \cancel{36}^{12} \times 9$$

$$= \frac{22 \times 12 \times 9}{7}$$

$$= \frac{2376}{7}$$

$$= 339.4 \text{ cm}^3$$