Exercise 13C

Question 12:

Let the radius be r metres and height be h metres.

$$\text{Area of the base} = (11 \times 4)\ m^2 = 44\ m^2$$

$$\therefore \quad \pi r^2 = 44$$

$$\Rightarrow \quad r^2 = \left(44 \times \frac{7}{22}\right) = 14\ m$$

$$\Rightarrow \quad r^2 = 14\ m$$

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

$$\therefore \text{ Volume of the cone} = (11 \times 20)\ m^3 = 220\ m^3$$

$$\Rightarrow \quad 220 = \frac{1}{3} \times \frac{22}{7} \times 14 \times h$$

$$\Rightarrow \quad h = \frac{220 \times 3}{22 \times 2} = 15\ m$$

$$\therefore \quad \text{the height of the cone} = 15m.$$

Question 13:

Here, height of the cylindrical bucket= 32 m and radius = 18 cm.

Now, let the radius of the heap be R cm and its slant height be ℓ cm

Then, $\pi \times (18)^2 \times 32 = \frac{1}{3}\pi \times R^2 \times 24$

$$\Rightarrow \quad R^2 = \frac{\pi \times 18 \times 18 \times 32 \times 3}{\pi \times 24} = 1296$$

$$\Rightarrow \quad R = \sqrt{1296} = 36\ cm.$$

$$\therefore \quad \text{Radius of the heap} = 36\ cm$$

$$\text{Slant height}(\ell) = \sqrt{h^2 + R^2}$$

$$= \sqrt{(24)^2 + (36)^2}$$

$$= \sqrt{576 + 1296}$$

$$= \sqrt{1872} = 43.27\ cm$$

$$\therefore \text{ Slant height of the heap} = 43.27\ cm.$$

Question 14:

Let the curved surface areas of cylinder and cone be 8x and 5x.

Then, $2\pi rh = 8x$ .....(i)

and, $\pi r\sqrt{h^2 + r^2} = 5x$ .....(ii)

Squaring both sides of equation (i), we have

$$(2\pi rh)^2 = (8x)^2$$

$$4\pi^2 r^2 h^2 = 64x^2 \text{ .....(iii)}$$

From (ii) we have,

$$\pi r\sqrt{h^2 + r^2} = 5x$$

Squaring both sides,

$$\Rightarrow \quad \pi^2 r^2 (h^2 + r^2) = 25x^2 \text{ .....(iv)}$$

$$\Rightarrow \quad \frac{4\pi^2 r^2 h^2}{\pi^2 r^2 (h^2 + r^2)} = \frac{64}{25} \quad [\text{Divide(iii) by (iv)}]$$

$$\Rightarrow \quad \frac{h^2}{(h^2 + r^2)} = \frac{16}{25}$$

$$\Rightarrow \quad 9h^2 = 16r^2$$

$$\Rightarrow \quad \frac{r^2}{h^2} = \frac{9}{16}$$

$$\Rightarrow \quad \frac{r}{h} = \frac{3}{4}$$

$\therefore$ The ratio of radius and height = 3 : 4

********** END **********