



Exercise 19B

Question 7:

External radius of shell = 12 cm and internal radius = 9 cm

$$\text{Volume of lead in the shell} = \frac{4}{3} \pi [(12)^3 - (9)^3] \text{ cm}^3$$

Let the radius of the cylinder be r cm

Its height = 37 cm

$$\text{Volume of cylinder} = \pi r^2 h = (\pi r^2 \times 37)$$

$$\therefore \frac{4}{3} \pi [(12)^3 - (9)^3] = \pi r^2 \times 37$$

$$\frac{4}{3} \times \pi \times 999 = \pi r^2 \times 37$$

$$r^2 = \frac{4}{3} \times \pi \times 999 \times \frac{1}{37\pi} = 36 \text{ cm}^2$$

$$r = \sqrt{36 \text{ cm}^2} = 6 \text{ cm}$$

Hence diameter of the base of the cylinder = 12 cm

Question 8:

Volume of hemisphere of radius 9 cm

$$= \left(\frac{2}{3} \times \pi \times 9 \times 9 \times 9 \right) \text{ cm}^3$$

Volume of circular cone (height = 72 cm)

$$= \frac{1}{3} (\pi \times r^2 \times 72) \text{ cm}$$

Volume of cone = Volume of hemisphere

$$\therefore \frac{1}{3} \times \pi r^2 \times 72 = \frac{2}{3} \pi \times 9 \times 9 \times 9$$

$$r^2 = \frac{2\pi}{3} \times 9 \times 9 \times 9 \times \frac{1}{24\pi} = 20.25$$

$$r = \sqrt{20.25} = 4.5 \text{ cm}$$

Hence radius of the base of the cone = 4.5 cm

Question 9:

Diameter of sphere = 21 cm

Hence, radius of sphere = $\left(\frac{21}{2}\right)$ cm

Volume of sphere = $\frac{4}{3}\pi r^3 = \left(\frac{4}{3} \times \frac{22}{7} \times \frac{21}{2} \times \frac{21}{2} \times \frac{21}{2}\right)$

Volume of cube = $a^3 = (1 \times 1 \times 1) \text{ cm}^3 = 1 \text{ cm}^3$

Let number of cubes formed be n

\therefore Volume of sphere = n \times Volume of cube

$\therefore \frac{4}{3} \times \frac{22}{7} \times \frac{21}{2} \times \frac{21}{2} \times \frac{21}{2} = n \times 1$

$= (441 \times 11) = n$

4851 = n

Hence, number of cubes is 4851.

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