



Exercise 19B

Question 1:

Radius of the cone = 12 cm and its height = 24 cm

$$\begin{aligned}\text{Volume of cone} &= \frac{1}{3} \pi r^2 h = \left(\frac{1}{3} \times \pi \times 12 \times 12 \times 24 \right) \text{cm}^3 \\ &= (48 \times 24) \pi \text{ cm}^3\end{aligned}$$

$$\text{Volume of each ball} = \frac{4}{3} \pi R^3 = \frac{4}{3} \pi \times 3 \times 3 \times 3 = (36\pi) \text{cm}^3$$

$$\begin{aligned}\text{Number of balls formed} &= \frac{\text{Volume of solid cone}}{\text{Volume of each ball}} \\ &= \frac{(48 \times 24\pi)}{36\pi} = 32\end{aligned}$$

Question 2:

Internal radius = 3 cm and external radius = 5 cm

$$\begin{aligned}\text{Volume of material in the shell} &= \frac{2}{3} \pi \times \left[(5)^3 - (3)^3 \right] \text{cm}^3 \\ &= \frac{2}{3} \times \frac{22}{7} \times 98 = \frac{616}{3} \text{cm}^3\end{aligned}$$

Radius of the cone = 7 cm

Let height of cone be h cm

$$\text{Volume of cone} = \left(\frac{1}{3} \times \frac{22}{7} \times 7 \times 7 \times h \right) \text{cm}^3 = \frac{154h}{3} \text{cm}^3$$

$$\therefore \frac{154h}{3} = \frac{616}{3}$$

$$\Rightarrow h = \frac{616}{154} = 4 \text{ cm}$$

Hence, height of the cone = 4 cm

Question 3:

Inner radius of the bowl = 15 cm

$$\text{Volume of liquid in it} = \frac{2}{3} \pi r^3 = \left(\frac{2}{3} \pi \times (15)^3 \right) \text{cm}^3$$

Radius of each cylindrical bottle = 2.5 cm and its height = 6 cm

Volume of each cylindrical bottle

$$= \pi r^2 h = \left(\pi \times \left(\frac{5}{2} \right)^2 \times 6 \right) \text{cm}^3$$

$$= \left(\frac{25}{4} \times 6 \pi \right) = \left(\frac{75\pi}{2} \right) \text{cm}^3$$

$$\text{Required number of bottles} = \frac{\text{Volume of liquid}}{\text{Volume of each cylindrical bottle}}$$

$$= \frac{\frac{2}{3} \times \pi \times 15 \times 15 \times 15}{\frac{75}{2} \times \pi} = 60$$

Hence, bottles required = 60

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