

Exercise 19B

Question 4:

Radius of the sphere =
$$\frac{21}{2}$$
 cm

Volume of the sphere =
$$\left(\frac{4}{3}\pi r^3\right) = \left[\frac{4}{3}\pi \times \left(\frac{21}{2}\right)^3\right] \text{cm}^3$$

Radius of cone = $\frac{7}{4}$ cm and height 3cm

Volume of cone =
$$\frac{1}{3}\pi r^2 h = \left(\frac{1}{3} \times \pi \times \left(\frac{7}{4}\right)^2 \times 3\right) am^3$$

Let the number of cones formed be n, then

$$n \times \frac{1}{3}\pi \times \left(\frac{7}{4}\right)^{2} \times 3 = \frac{4}{3}\pi \times \left(\frac{21}{2}\right)^{3}$$

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

$$n = 504$$

Hence, number of cones formed = 504

Question 5:

Radius of the cannon ball = 14 cm

Volume of cannon ball =
$$\frac{4}{3}\pi r^3 = \left[\frac{4}{3}\pi \times (14)^3\right] \text{cm}^3$$

Radius of the cone =
$$\frac{35}{2}$$
 cm,

Let the height of cone be h cm

$$\therefore \text{ Volume of cone} = \left[\frac{1}{3}\pi \times \left(\frac{35}{2}\right)^2 \times h\right] \text{cm}^3$$

$$\therefore \frac{4}{3}\pi \times \left(14\right)^3 = \frac{1}{3}\pi \times \left(\frac{35}{2}\right)^2 \times h$$

$$h = \frac{4}{3}\pi \times 14 \times 14 \times 14 \times \frac{3}{\pi} \times \frac{2}{35} \times \frac{2}{35}$$

$$= 35.84 \text{ cm}$$

Hence, height of the cone = 35.84 cm

Question 6:

Let the radius of the third ball be r cm, then, Volume of third ball = Volume of spherical ball - volume of 2 small balls

Volume of third ball =
$$\left[\frac{4}{3}\pi(3)^3 - \left\{\frac{4}{3}\pi\left(\frac{3}{2}\right)^3 + \frac{4}{3}\pi(2)^3\right\}\right]$$

= $\left[36\pi - \left(\frac{9\pi}{2} + \frac{32\pi}{3}\right)\right]$ cm³ = $\frac{125\pi}{6}$ cm³

$$\therefore \frac{4}{3}\pi r^3 = \frac{125\pi}{6}$$

$$r^3 = \frac{125\pi \times 3}{6 \times 4 \times \pi} = \frac{125}{8}$$

$$r = \left(\frac{5}{2}\right)$$
 cm = 2.5 cm

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