



Exercise 19B

Question 15:

Diameter of sphere = 18 cm

Radius of copper sphere = $3600/100 \text{ m} = 36 \text{ m}$

$$\begin{aligned}\text{Volume of sphere} &= \left(\frac{4}{3} \times \pi \times r^3 \right) \text{cm}^3 \\ &= \left(\frac{4}{3} \pi \times 9 \times 9 \times 9 \right) \text{cm}^3 = 972 \pi \text{cm}^3\end{aligned}$$

Length of wire = 108 m = 10800 cm

Let the radius of wire be $r \text{ cm}$

$$= \pi r^2 l \text{ cm}^3 = (\pi r^2 \times 10800) \text{ cm}^3$$

But the volume of wire = Volume of sphere

$$\Rightarrow \pi r^2 \times 10800 = 972 \pi$$

$$r^2 = \frac{972 \pi}{10800 \pi} = 0.09 \text{ cm}^2$$

$$r = \sqrt{0.09} \text{ cm} = 0.3$$

Hence the diameter = $2r = (0.3 \times 2) \text{ cm} = 0.6 \text{ cm}$

Question 16:

The radii of three metallic spheres are 3 cm, 4 cm and 5 cm respectively.

$$= \frac{4}{3} \pi (3^3 + 4^3 + 5^3) \text{cm}^3$$

Sum of their volumes

$$= \frac{4}{3} \pi (27 + 64 + 125) = \frac{4}{3} \pi \times 216$$

Let r be the radius of sphere whose volume is equal to the total volume of three spheres.

$$\frac{4}{3} \pi r^3 = \frac{4}{3} \pi \times 216$$

$$\Rightarrow r^3 = 216$$

$$\therefore r = 6 \text{ cm}$$

$$\therefore \text{Diameter} = 6 \times 2 = 12 \text{ cm}$$

***** END *****