



Exercise 13D

Question 12:

Here, Diameter of a sphere = 6 cm

$$\therefore \text{radius}(R) = \left(\frac{6}{2}\right) \text{ cm} = 3 \text{ cm}$$

Diameter of wire = 2 mm

$$\therefore \text{radius}(r) = 1 \text{ mm} = 0.1 \text{ cm}$$

Let the required length of wire be h cm.

Then,

$$\begin{aligned} \Rightarrow \pi \times (r)^2 \times h &= \frac{4}{3} \times \pi \times (R)^3 \\ \Rightarrow \pi \times (0.1)^2 \times h &= \frac{4}{3} \times \pi \times (3)^3 \\ \Rightarrow h &= \frac{\frac{4}{3} \times \pi \times 27}{\pi \times (0.1)^2} \\ &= \left(\frac{4 \times 9}{0.01}\right) \text{ cm} = \frac{36}{0.01} \\ &= 3600 \text{ cm} = 36 \text{ m} \end{aligned}$$

\therefore the length of the wire = 36 m.

Question 13:

Here, diameter of sphere = 18 cm

$$\therefore \text{radius of sphere} = \left(\frac{18}{2}\right) \text{ cm} = 9 \text{ cm}$$

Length of the wire = 108 m = 10800 cm

Then,

$$\begin{aligned} \Rightarrow \frac{4}{3} \pi \times (r)^3 &= \pi \times r^2 \times 10800 \\ \Rightarrow \frac{4}{3} \pi \times (9)^3 &= \pi \times r^2 \times 10800 \\ \Rightarrow r^2 &= \frac{\frac{4}{3} \times \pi \times 729}{\pi \times 10800} \\ &= \frac{4 \times 243}{10800} = \frac{972}{10800} = \frac{9}{100} \\ \Rightarrow r &= \sqrt{\frac{9}{100}} = \frac{3}{10} = 0.3 \\ \therefore r &= 0.3 \text{ cm} \end{aligned}$$

So,

$$\text{Diameter} = (2 \times 0.3) \text{ cm} = 0.6 \text{ cm.}$$

***** END *****