Exercise 13D

Question 12:

Here, Diameter of a sphere $= 6\,cm$

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

Diameter of wire $= 2\,mm$

$\therefore$ radius $(r) = 1\,mm = 0.1\,cm$

Let the required length of wire be h cm.

Then,

$$\pi \times (r)^2 \times h = \frac{4}{3} \times \pi \times (R)^3$$

$$\Rightarrow \quad \pi \times (0.1)^2 \times h = \frac{4}{3} \times \pi \times (3)^3$$

$$\Rightarrow \quad h = \frac{\frac{4}{3} \times \pi \times 27}{\pi \times (0.1)^2}$$

$$= \left(\frac{4 \times 9}{0.01}\right) cm = \frac{36}{0.01}$$

$$= 3600\,cm = 36\,m$$

$\therefore$ the length of the wire $= 36\,m$.

Question 13:

Here, diameter of sphere $= 18\,cm$

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

Length of the wire $= 108\,m = 10800\,cm$

Then,

$$\frac{4}{3}\pi \times (r)^3 = \pi \times r^2 \times 10800$$

$$\Rightarrow \quad \frac{4}{3}\pi \times (9)^3 = \pi \times r^2 \times 10800$$

$$\Rightarrow \quad r^2 = \frac{\frac{4}{3} \times \pi \times 729}{\pi \times 10800}$$

$$= \frac{4 \times 243}{10800} = \frac{972}{10800} = \frac{9}{100}$$

$$\Rightarrow \quad r = \sqrt{\frac{9}{100}} = \frac{3}{10} = 0.3$$

$\therefore$ $r = 0.3\,cm$

So, Diameter $= (2 \times 0.3)\,cm = 0.6\,cm$.

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