Exercise 19B

Question 15:
Diameter of sphere = 18 cm
Radius of copper sphere = 3600/100 m = 36 m

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

$$= \left(\frac{4}{3}\pi \times 9 \times 9 \times 9\right) cm^3 = 972\pi\, cm^3$$

Length of wire = 108 m = 10800 cm
Let the radius of wire be r cm
$= \pi r^2 l\ cm^3 = (\pi r^2 \times 10800)\ cm^3$
But the volume of wire = Volume of sphere

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

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

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

Hence the diameter = 2r = (0.3 × 2) cm = 0.6 cm

Question 16:
The radii of three metallic spheres are 3 cm, 4 cm and 5 cm respectively.

Sum of their volumes $= \frac{4}{3}\pi\left(3^3 + 4^3 + 5^3\right) cm^3$

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

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

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

$$\Rightarrow \quad r^3 = 216$$

$$\therefore \quad r = 6\,cm$$

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

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