Exercise 11.1

Assume $\pi = \frac{22}{7}$, unless stated otherwise.

1. *Diameter of the base of a cone is 10.5 cm and its slant height is 10 cm. Find its curved surface area.*

Sol. Curved surface area $= \pi rl = \frac{22}{7} \times \frac{10.5}{2} \times 10 \text{ cm}^2$

$= 165 \text{ cm}^2.$

2. *Find the total surface area of a cone, if its slant height is 21 m and diameter of its base is 24 m.*

Sol. Total surface area $= \pi rl + \pi r^2 = \pi r(l + r)$

$= \frac{22}{7} \times 12 \times (21 + 12) \text{ cm}^2$

$= 1244.57 \text{ m}^2.$

3. *Curved surface area of a cone is 308 cm^2 and its slant height is 14 cm. Find*

(i) radius of the base and

(*ii*) *total surface area of the cone.*

Sol. (*i*) Given: $\pi rl = 308 \Rightarrow \frac{22}{7} \times r \times 14 = 308$

$$\Rightarrow \quad r = \frac{308}{44} = 7 \text{ cm}$$

$\therefore$ Radius of the base = 7 cm.

(*ii*) Total surface area = $\pi rl + \pi r^2$

$$= 308 + \frac{22}{7} \times (7)^2 = 462 \text{ cm}^2.$$

4. *A conical tent is 10 m high and the radius of its base is 24 m. Find*

(*i*) *slant height of the tent.*

(*ii*) *cost of the canvas required to make the tent, if the cost of 1 m^2 canvas is ₹ 70.*

Sol. Base radius = 24 m, height = 10 m.

(*i*) Slant height = $\sqrt{(24)^2 + (10)^2}$ m = $\sqrt{576 + 100}$ m

$$= \sqrt{676} \text{ m} = 26 \text{ m}.$$

(*ii*) Total canvas required = $\pi rl = \frac{22}{7} \times 24 \times 26 \text{ m}^2$

$$\therefore \quad \text{Cost} = ₹ \left(70 \times \frac{22}{7} \times 24 \times 26\right) = ₹ 137280.$$

5. *What length of tarpaulin 3 m wide will be required to make conical tent of height 8 m and base radius 6 m? Assume that the extra length of material that will be required for stitching margins and wastage in cutting is approximately 20 cm. (Use $\pi = 3.14$).*

Sol. Slant height of the tent = $\sqrt{(6)^2 + (8)^2}$ m = $\sqrt{36 + 64}$ m

= 10 m.

Area of tarpaulin required = πrl = 3.14 × 6 × 10 m^2

$$= 188.4 \text{ m}^2.$$

$\therefore$ Length of tarpaulin required = $\frac{188.4}{3}$ = 62.8 m.

Total length required including wastage = (62.8 + 0.2) m = 63 m.

6. *The slant height and base diameter of a conical tomb are 25 m and 14 m respectively. Find the cost of white-washing its curved surface at the rate of ₹ 210 per 100 m^2.*

Sol. Curved surface area = $\pi rl = \frac{22}{7} \times 7 \times 25 \text{ m}^2 = 550 \text{ m}^2$.

Cost of white-washing = ₹ $\left(210 \times \frac{550}{100}\right)$ = ₹ 1155.

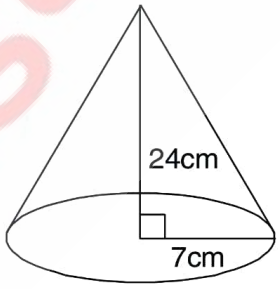
7. *A joker's cap is in the form of a right circular cone of base radius 7 cm and height 24 cm. Find the area of the sheet required to make 10 such caps.*

Sol. Slant height of joker's cap

$= \sqrt{(24)^2 + (7)^2}$ cm

$= \sqrt{576 + 49}$ cm

$= \sqrt{625}$ cm = 25 cm.



∴ Area of sheet required for 10 caps

$= 10 \times \pi rl = 10 \times \frac{22}{7} \times 7 \times 25 \text{ cm}^2 = 5500 \text{ cm}^2$.

8. *A bus stop is barricaded from the remaining part of the road, by using 50 hollow cones made of recycled cardboard. Each one has a base diameter of 40 cm and height 1 m. If the outer side of each of the cones is to be painted and the cost of painting is ₹ 12 per m^2, what will be the cost of painting all these cones? (Use $\pi = 3.14$ and take $\sqrt{1.04} = 1.02$.)*

Sol. Slant height of each cone (l) = $\sqrt{(1)^2 + (0.2)^2}$ m

$= \sqrt{1.04}$ m = 1.02 m.

∴ Area to be painted for 50 hollow cones

$= 50 \times \pi rl$

$= (50 \times 3.14 \times 0.2 \times 1.02)\ \text{m}^2$

$= 32.028\ \text{m}^2$

Cost of painting = ₹ (12 × 32.028)

= ₹ 384.34 (approx.).