**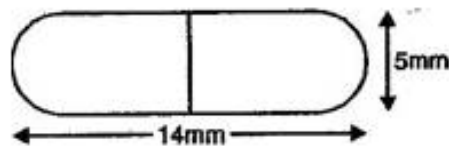6. A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends (see figure). The length of the entire capsule is 14 mm and the diameter of the capsule is 5 mm. Find its surface area.**
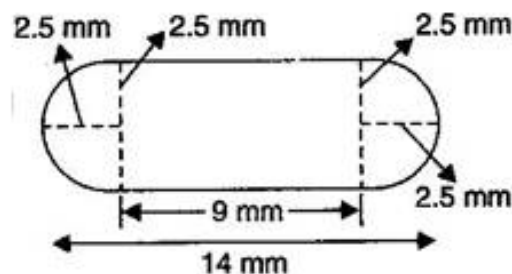


**Ans.** Radius of the hemisphere $= \dfrac{5}{2}$ mm

Let radius $= r = 2.5$ mm

Cylindrical height = Total height − Diameter of sphere $= h = 14 - (2.5 + 2.5) = 9$ mm

Surface area of the capsule = CSA of cylinder + Surface area of the hemisphere



$= 2\pi rh + 2\left(2\pi r^2\right)$

$= 2\pi\left(\dfrac{5}{2}\right)(9) + 2\left\{2\pi\left(\dfrac{5}{2}\right)^2\right\}$

$= 45\pi + 25\pi$

$= 70\pi = 70 \times \dfrac{22}{7} = 220 \ mm^2$

**7. A tent is in the shape of a cylinder surmounted buy a conical top. If the height and diameter of the cylindrical part are 2.1 m and 4 m respectively and the slant height of the top is 2.8 m, find the area of the canvas used for making the tent. Also, find the cost of the canvas of the tent at the rate of Rs. 500 per $m^2$. (Note that the base of the tent will not be covered with canvas.)**

**Ans.** Diameter of the cylindrical part $= 4$ cm

$\therefore$ Radius of the cylindrical part $= 2$ cm

TSA of the tent $=$ CSA of the cylindrical part $+$ CSA of conical cap
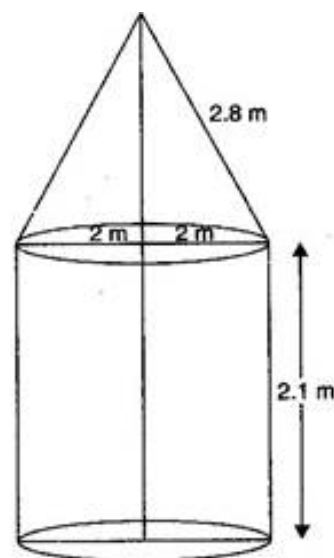


$= 2\pi(2)(2.1) + \pi(2)(2.8)$

$= 8.4\pi + 5.6\pi$

$= 14\pi$

$= 14 \times \dfrac{22}{7}$

$= 44 \ m^2$

$\therefore$ Cost of the canvas of the tent at the rate of Rs. 500 per $m^2$

$= 44 \times 500 = $ Rs. 22000

**8. From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid to the nearest $cm^2$.**

**Ans.** Diameter of the solid cylinder = 1.4 cm

∴ Radius of the solid cylinder = 0.7 cm

∴ Radius of the base of the conical cavity = 0.7 cm
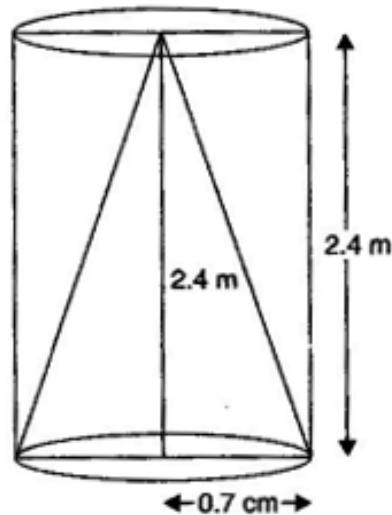


Height of the solid cylinder = 2.4 cm

∴ Height of the conical cavity = 2.4 cm

∴ Slant height of the conical cavity =
$$\sqrt{(0.7)^2 + (2.4)^2}$$

$$= \sqrt{0.49 + 5.76}$$

$$= \sqrt{6.25} = 2.5 \text{ cm}$$

∴ TSA of remaining solid
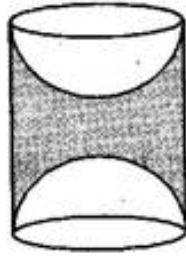
$$= 2\pi(0.7)(2.4) + \pi(0.7)^2 + \pi(0.7)(2.5)$$

$$= 3.36\pi + 0.49\pi + 1.75\pi$$

$$= 5.6\pi$$

$$= 5.6 \times \frac{22}{7} = 17.6 \text{ } cm^2$$

$$= 18 \text{ } cm^2 \text{ (to the nearest } cm^2)$$

**9. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder as shown in figure. If the height of the cylinder is 10 cm and its base is of radius 3.5 cm, find the total surface area of the article.**



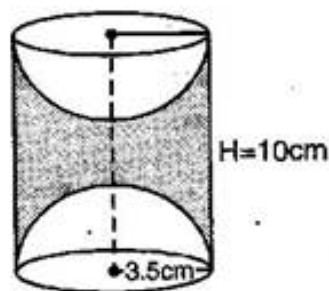**Ans.** TSA of the article $= 2\pi rH + 2\left(2\pi r^2\right)$

$$= 2\pi(3.5)(10) + 2\left[2\pi(3.5)^2\right]$$

$$= 70\pi + 49\pi$$

$$= 119\pi$$

$$= 119 \times \frac{22}{7}$$

$$= 374 \; cm^2$$



H=10cm

3.5cm

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