

Surface Areas and Volumes Ex.16.2 Q12

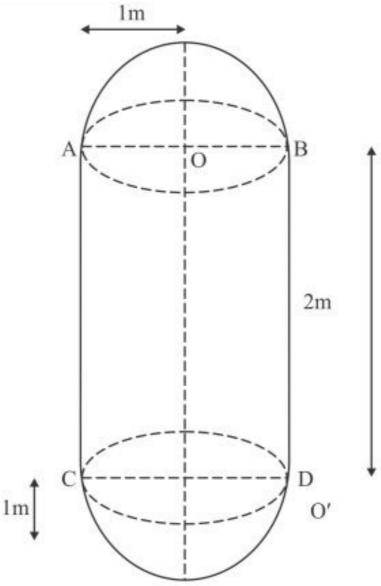
Answer:

Given that:

Height of the cylinder h = 2 m

Radius of the cylinder and hemisphere are same and is given by

$$r = \frac{d}{2} = \frac{2}{2} = 1 \text{ m}$$



The volume of the cylinder is cylinder is

$$V_1 = \pi r^2 h$$

$$= \frac{22}{7} \times 1^2 \times 2$$
$$= \frac{22}{7} \times 2 \text{ m}^3$$

There are two hemispheres at each ends of the cylinder, therefore the volume of the two

$$V_2 = \frac{2}{3}\pi r^3 + \frac{2}{3}\pi r^3$$
$$= \frac{4}{3} \times \frac{22}{7} \times 1^3$$
$$= \frac{22}{7} \times \frac{4}{3} \text{ m}^3$$

Therefore, the total volume of the boiler is given by

$$V = V_1 + V_2$$

$$= \left(\frac{22}{7} \times 2 + \frac{22}{7} \times \frac{4}{3}\right) \text{ m}^3$$

$$= \frac{22}{7} \times \frac{10}{3} \text{ m}^3$$

$$= \frac{220}{21} \text{ m}^3$$

Hence the volume of the boiler is $V = \frac{220}{21} \text{ m}^3$

Surface Areas and Volumes Ex.16.2 Q13

Given that:

Radius of the same base $r = \frac{3.5}{2} = 1.75 \text{ m}$

Height of the cylinder $h = \frac{14}{3}$ m

The volume of the vessel is given by

$$V = \pi r^2 h + \frac{2}{3} \pi r^3$$

$$= 3.14 \times 1.75^2 \times \frac{14}{3} + \frac{2}{3} \times 3.14 \times 1.75^3$$

$$= 56 \text{ m}^3$$

The internal surface area of the solid is

$$S = 2\pi r^2 + 2\pi rh$$

= 2×3.14×1.75² + 2×3.14×1.75× $\frac{14}{3}$
= 70.51 m²

Hence, the volume of the vessel and internal surface area of the solid is $V = 56 \text{ m}^3$, $S = 70.51 \text{ m}^2$

Surface Areas and Volumes Ex.16.2 Q14

Answer:

We have a solid composed of cylinder with hemispherical ends.

Radius of the two curved surfaces (r) = 7 cm

Height of cylinder is h.

Total height of the body (h+2r)=104 cm

So, total surface area is given by,

Total surface area = Curved surface area of cylinder +

+2(Curves surface area of hemisphere)

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

$$=2\pi r(h+2r)$$

$$=2(3.14)(7)(104)$$
 cm²

$$=4571.84$$
 cm²

Change the units of curved surface area as,

Total surface area =
$$\frac{4571.84}{100}$$
 dm²

$$=45.7184 \text{ dm}^2$$

Cost of polishing the surface is Rs 10 per dm^2 .

So total cost,

$$= Rs(45.7184)(10)$$

$$= Rs 457.18$$

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