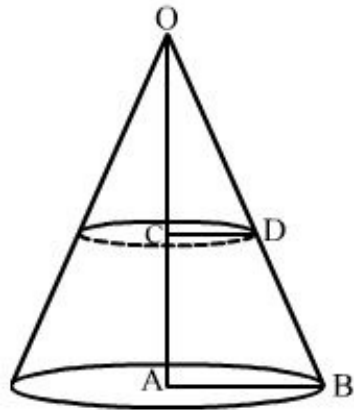




Surface Areas and Volumes Ex.16.3 Q18

Answer :



Let the height of the cone be H .

Now, the cone is divided into two parts by the parallel plane

$\therefore OC = CA$

Now, In $\triangle OCD$ and OAB

$\angle OCD = \angle OAB$ (Corresponding angles)

$\angle ODC = \angle OBA$ (Corresponding angles)

By AA-similarity criterion $\triangle OCD \sim \triangle OAB$

$$\begin{aligned} \frac{\text{Volume of first part}}{\text{Volume of second part}} &= \frac{\frac{1}{3}\pi(CD)^2(OC)}{\frac{1}{3}\pi CA \left[(AB)^2 + (AB)(CD) + CD^2 \right]} \\ &= \frac{(5)^2}{\left[(10)^2 + (10)(5) + 5^2 \right]} \\ &= \frac{25}{100 + 50 + 25} \\ &= \frac{25}{175} \\ &= \frac{1}{7} \end{aligned}$$

Surface Areas and Volumes Ex.16.3 Q19

Answer :

The slant height of the bucket is given by

$$\begin{aligned}l &= \sqrt{h^2 + (R - r)^2} \\&= \sqrt{(24)^2 + (15 - 5)^2} \\&= \sqrt{576 + 100} \\&= \sqrt{676} \\&= 26 \text{ cm}\end{aligned}$$

Surface area of bucket

= Curved surface area of bucket + Area of the smaller circular base

$$\begin{aligned}&= \pi l(R + r) + \pi r^2 \\&= 3.14 \times 26 \times (15 + 5) + 3.14 \times 5 \times 5 \\&= 1632.8 + 78.5 \\&= 1711.3 \text{ cm}^2\end{aligned}$$

$$\text{Cost of metal sheet used} = \frac{10}{100} \times 1711.3 = \text{Rs } 171.13$$

***** END *****