

Surface Areas and Volumes Ex.16.2 Q9 Answer:

To find the total capacity of the tank, we have to add the volume of the cylinder and cone.

Diameter of the cylinder, d = 21 cm

Radius of the cylinder, $r=rac{d}{2}=rac{21}{2}$ cm

Height of the cylinder, $h_1=18\,\mathrm{cm}$

Also, radius of cone, $r = \frac{21}{2}$ cm

Height of the cone, $h_2=9\,\mathrm{cm}$

Now.

Total capacity of the tank

= Volume of the cylinder + Volume of 2 cones

$$= \pi r^{2} h_{1} + 2 \times \frac{1}{3} \pi r^{2} h_{2}$$

$$= \pi r^{2} \left(h_{1} + \frac{2}{3} h_{2} \right)$$

$$= \frac{22}{7} \times \left(\frac{21}{2} \right)^{2} \times \left(18 + \frac{2}{3} \times 9 \right)$$

$$= \frac{22}{7} \times \left(\frac{21}{2} \right)^{2} \times 24$$

$$= 8316 \text{ cm}^{3}$$

Hence the total capacity of the tank is 8316 cm3.

Surface Areas and Volumes Ex.16.2 Q10

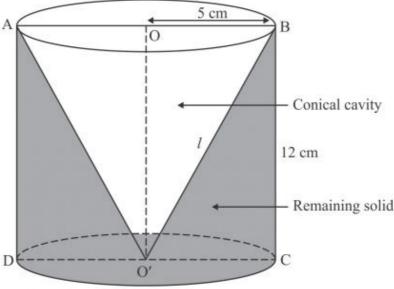
Answer:

Given that:

$$r = 5 \text{ cm}$$

$$h = 12 \text{ cm}$$

We have the following diagram



Slant height of cone is given by

$$l = \sqrt{r^2 + h^2}$$
$$= \sqrt{5^2 + 12^2}$$
$$= 13 \text{ cm}$$

The total surface area of the remaining part is given by

$$S = 2\pi rh + \pi r^{2} + \pi rl$$

$$= 2 \times \pi \times 5 \times 12 + \pi \times 5^{2} + \pi \times 5 \times 13$$

$$= 120\pi + 25\pi + 65\pi$$

$$= 210\pi \text{ cm}^{2}$$

The volume of the remaining part is given by

$$V = \pi r^{2}h - \frac{1}{3}\pi r^{2}h$$

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

$$= \frac{2}{3} \times \pi \times 5^{2} \times 12$$

$$= 200\pi \text{ cm}^{3}$$
Hence, $S = 210\pi \text{ cm}^{2}$, $V = 200\pi \text{ cm}^{3}$

Surface Areas and Volumes Ex.16.2 Q11

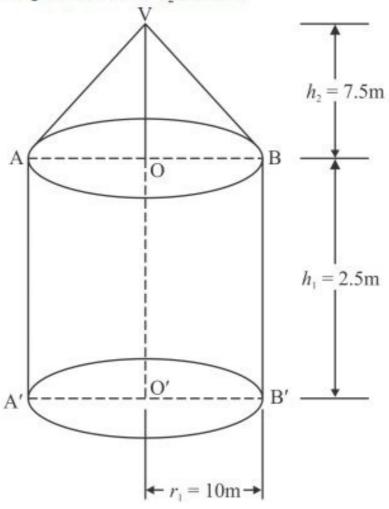
Answer:

Given that:

Radius of the base $r = \frac{d}{2} = \frac{20}{2} = 10 \text{ m}$

Height of the cylinder $h_1 = 2.5 \text{ m}$

Height of the cone $h_2 = 7.5 \text{ m}$



Slant height of the cone

$$l = \sqrt{r^2 + h^2}$$

$$= \sqrt{10^2 + 7.5^2}$$
= 12.5 m

The total capacity of the tent is given by

$$V = \pi r^2 h_1 + \frac{1}{3} \pi r^2 h_2$$

$$= \pi \times 10^2 \times 2.5 + \frac{1}{3} \times \pi \times 10^2 \times 7.5$$

$$= \pi \times 250 + \pi \times 250$$

$$= 500 \pi \text{ m}^3$$

The total area of canvas required for the tent is

$$S = 2\pi r h_1 + \pi r l$$

$$= 2 \times 3.14 \times 10 \times 2.5 + 3.14 \times 10 \times 12.5$$

$$= \pi (2 \times 10 \times 2.5 + 10 \times 12.5)$$

$$= \pi (50 + 125)$$

$$= \frac{22}{7} \times 175$$

$$= 550 \text{ m}^2$$

Therefore, the total cost of the canvas is

$$=100 \times 550$$

$$= Rs. 55000$$

Hence, the total capacity and cost is $V = 500\pi \text{ m}^3$, and Rs. 55000

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