Surface Areas and Volumes Ex.16.1 Q4

Answer :

The brass volume that has to be drawn into a cylindrical wire is given is $2.2\ dm^3=2.2\times10^{-3}\ m^3$

We have to make a cylindrical wire out of it with diameter =0.25 cm

So the radius of this wire $0.125\times10^{-2}\ m$

We have to find the length of this wire.

Let the length of this wire be h

We know that the volume of a cylinder $=\pi r^2h$.

We know, the volume of the cylinder should be equal to the volume of the given brass

$$\Rightarrow \pi\left(0.125\times10^{-2}\right)^2\times h=2.2\times10^{-3}$$

$$h=\frac{22\times10^{-3}\times10^4}{\pi\times.125\times.125}$$

$$=\frac{22\times7}{22\times.125\times.125}$$

$$=\frac{4\times7}{.25\times.25}$$

$$=448$$

Therefore, h = 448 m

Hence, the length of the cylindrical wire that can be formed is 448 m

Surface Areas and Volumes Ex.16.1 Q5

Answer :

We are given a solid cylinder of, diameter = 2 cm

We have to recast it into a hollow cylinder of length = 16 cm

External Diameter = 20 cm and thickness = 2.5 mm=0.25 cm

We have to find the height of the solid cylinder that can be used to get a hollow cylinder of the desired dimensions.

Volume of a solid cylinder $=\pi r^2h$

So,

The volume of the given solid cylinder $=\pi(1)^2h$ ..... (a)

Here, height h has to be found.

Volume of a hollow cylinder $=\pi h\left(R^2-r^2\right)$

Where R is the external radius and r is the internal radius

External radius is given. Thickness of the hollow cylinder is also given.

So, we can find the internal radius of the hollow cylinder.

Thickness=$R-r$

$$\Rightarrow 0.25=10-r$$

$$\Rightarrow r=9.75\ cm$$

So, the volume of the hollow cylinder $=\pi\times16\times(100-95.0625)$ ..... (b)

From (a) and (b) we get,

$$\pi(1)^2h=\pi\times16\times(100-95.0625)$$

$$\cancel{\pi}h=\cancel{\pi}\times16\times(100-95.0625)$$

$$h=16\times(4.9375)$$

$$h=79\ cm$$

Hence, the required height of the solid cylinder is h=79 cm

Surface Areas and Volumes Ex.16.1 Q6

Answer :

A cylindrical vessel whose height is equal to its diameter is given.
It is filled with water.
We know that the volume of a cylinder $= \pi r^2 h$
In this particular case,
Height is equal to the diameter, that is $h = 2r$,
The volume of cylindrical vessel becomes $= 2\pi r^3$
The water from this vessel is transferred into two identical cylindrical vessels of
Diameter = 42 cm and, height *h*= 21 cm
Volume of each vessel $= \pi (21)^2 \times 21$
We know that the sum of the volumes of the two identical vessels must be equal to the volume of the given cylindrical vessel.

$$\Rightarrow 2\pi r^3 = 2 \times \left(\pi (21)^2 \times 21 \right)$$

$$r^3 = (21)^3$$

Therefore, $r = 21$
The diameter of the given cylinder is 42 cm

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