Surface Areas and Volumes Ex.16.1 Q10

Answer :

Assume the well as a solid right circular cylinder. Then, the radius of the solid right circular cylinder is

$r = \frac{3.5}{2} = 1.75$ m

The well is 16m deep. Thus, the height of the solid right circular cylinder is $h = 16$ m.

Therefore, the volume of the solid right circular cylinder is

$V_1 = \pi r^2 h$

$= \frac{22}{7} \times (1.75)^2 \times 16$ cubic meters

Let the height of the platform formed be x m. The length and the breadth of the platform are l=27.5m and b=7m respectively. Therefore, the volume of the platform is

$V_2 = lbx = 27.5 \times 7 \times x = 192.5x$ cubic meters

Since, the well is spread to form the platform; the volume of the well is equal to the volume of the platform. Hence, we have

$V_1 = V_2$

$\Rightarrow \frac{22}{7} \times (1.75)^2 \times 16 = 192.5x$

$\Rightarrow x = \frac{22}{7 \times 192.5} \times (1.75)^2 \times 16$

$\Rightarrow = \frac{22 \times 3.0625 \times 16}{7 \times 192.5}$

$\Rightarrow = 0.8$

Hence, the height of the platform is 0.8 m = 80 cm.

Surface Areas and Volumes Ex.16.1 Q11

Answer :

Assume the well as a solid right circular cylinder. Then, the radius of the solid right circular cylinder is

$r = \frac{2}{2} = 1$

The well is 14m deep. Thus, the height of the solid right circular cylinder is $h = 14$ m.

Therefore, the volume of the solid right circular cylinder is

$V_1 = \pi r^2 h = \frac{22}{7} \times (1)^2 \times 14 = 44$ cubic meters

Since, the embankment is to form around the right circular cylinder. Let the width of the embankment be x m. The height of the embankment is h = 40 cm = 0.4 m. Therefore, the volume of the platform is

$V_2 = \pi\left((1+x)^2 - 1^2\right) \times .4$

Since, the well is spread to form the platform; the volume of the well is equal to the volume of the platform. Hence, we have

$V_1 = V_2$

$\pi\left((1+x)^2 - 1^2\right) \times .4 = 44$

$x^2 + 2x - 35 = 0$

$(x-5)(x+7) = 0$

$\Rightarrow x = 5$ or $x = -7$

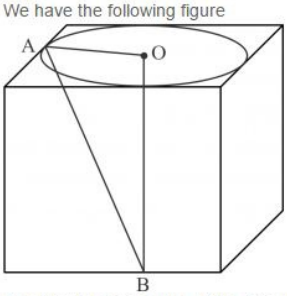
Hence, x = 5

Hence, $\boxed{\text{width} = 5 \text{ m}}$

Surface Areas and Volumes Ex.16.1 Q12

Answer :

We have the following figure



The length of each side of the cube is 9 cm. We have to find the volume of the largest right circular cone contained in the cube.

The diameter of the base circle is same as the length of the side of the cube. Thus, the diameter of the base circle of the right circular cone is 9 cm. Therefore, the radius of the base of the right circular cone is $r = 4.5$ cm.

From the right angled triangle ΔAOB we have

h = 9 cm

Therefore, the volume of the solid right circular cone is

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

$$= \frac{1}{3} \times \frac{22}{7} \times (4.5)^2 \times 9$$

$$= 190.93$$

Hence largest volume of cone is $\boxed{190.93 \text{ cm}^3}$

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