Exercise 13C

Question 15:

Here, height (h) of cylinder = 2.8 m = 280 cm

and diameter = 20 cm

$\Rightarrow$ radius $= \left(\frac{20}{2}\right) = 10$ cm

height(H) of the cone = 42 cm

$\therefore$ Volume of the pillar $= (\pi r^2 h + \frac{1}{3}\pi r^2 H)\ cm^3$

$= \pi r^2 (h + \frac{1}{3}H)\ cm^3$

$= \frac{22}{7} \times 10 \times 10 (280 + \frac{1}{3} \times 42)\ cm^3$

$= \frac{2200}{7} \times [280 + 14]$

$= 92400\ cm^3$

$\therefore$ Weight of pillar $= \left(\frac{92400 \times 7.5}{1000}\right) kg = 693 kg$

Question 16:

Let the smaller cone have radius = r cm and height =h cm
And, let the radius of the given original cone be R cm
Since the two triangles, ΔOCD and ΔOAB
are similar to each other, we have

Then, $\frac{r}{R} = \frac{h}{30}$ $[\because \Delta OCD \sim \Delta OAB]$

$\Rightarrow$ $r = \frac{Rh}{30}$ .....(1)

Given that the volume of the small cone is
$\frac{1}{27}$ of the volume of the given cone.

$\therefore$ $\frac{1}{3}\pi r^2 h = \frac{1}{27} \times \frac{1}{3}\pi R^2 \times 30$ [given]

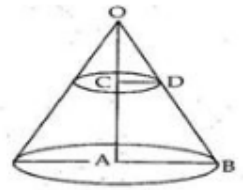
$\Rightarrow$ $\frac{1}{3}\pi\left(\frac{hR}{30}\right)^2 h = \frac{1}{81}\pi R^2 \times 30$ [from (1)]

$\Rightarrow$ $\frac{1}{3}\pi\frac{h^3R^2}{900} = \frac{1}{81}\pi R^2 \times 30$

$\Rightarrow$ $h^3 = \frac{1 \times 30 \times 900 \times 3}{81}$

$\Rightarrow$ $h^3 = 1000\ cm^3$

$\Rightarrow$ $h = 10\,cm$



From the figure,
AC = (OA – OC)
= (30 – 10) cm = 20 cm
$\therefore$ the required height = 20 cm

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