

# AI1110 assignment1(ICSE Class 10 2017)

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## QUESTION 6(B)

A conical tent is to accommodate 77 persons. Each person must have  $16m^3$  of air to breathe. Given the radius of the tent as  $7m$  find the height of the tent and also its curved surface area.

## SOLUTION:

Given a conical tent which can accommodate 77 persons and each person must have  $16m^3$  of air to breathe.

so the volume of conical tent is,

$$v = 77 \times 16m^3$$

we know that volume of conical tent is same as a cone having radius  $r$ , height  $h$ ,

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

from the question we are given radius of cone,

$$r = 7m$$

height of cone is

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

By substituting values we can get,

$$h = 24m$$

Now we know radius and height so we can find lateral height  $l$  which is given by,

$$\begin{aligned} l &= \sqrt{r^2 + h^2} \\ \Rightarrow l &= \sqrt{7^2 + 24^2} \\ \Rightarrow l &= 25m \end{aligned}$$

we know that lateral/curved surface area  $s$  of a cone is given by,

$$\begin{aligned} s &= \pi \times r \times l \\ \Rightarrow s &= \frac{22}{7} \times 7 \times 25 \\ \Rightarrow s &= 550m^2 \end{aligned}$$

Hence the curved surface area is  $550m^2$ .

variables	formula	value given/obtained
radius	$r$	$7m$
volume	$v = \pi r^2 h$	$1232m^3$
height	$h = \frac{3v}{\pi r^2}$	$24m$
curved surface area	$s = \pi r l$	$550m^2$

In above table;

$r$  and  $v$  are inputs(given in question),

$h$  and  $s$  are outputs(found by solving).

The output of the program used to find and verify these numbers is:

```
PS C:\Users\Bhargava ram\Desktop\STUDY\sem2\AI1110\assignment1\codes> gcc main.c
PS C:\Users\Bhargava ram\Desktop\STUDY\sem2\AI1110\assignment1\codes> ./a.exe
1232 7
Height of the tent is 24m
curved surface area of the conical tent is 550m2
```

Fig. 1: output of c code