Assignment 1

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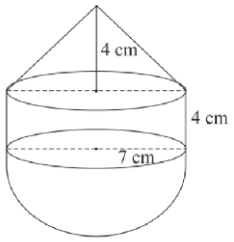
ICSE 2018 Question 9 (c)

(c) The following figure represents a solid consisting of a right circular cylinder with a hemisphere at one end and a cone at the other. Their common radius is 7 cm. The height of the cylinder and cone are each of 4 cm. Find the volume of the solid.



Solution :
Here, radius of cone = radius of cylinder = radius of hemisphere = 7 cm
Height of cone = Height of cylinder = 4 cm

$$\text{Volume of the figure} = \text{Vol. of cone} + \text{Vol. of cylinder} + \text{Vol. of hemisphere} \tag{1}$$

$$\text{Volume of cone} = \frac{1}{3} \times \pi \times r^2 \times h = \frac{1}{3} \times \pi \times 49 \times 4 = \frac{196}{3} \times \pi \tag{2}$$

$$\text{Volume of cylinder} = \pi \times r^2 \times h = \pi \times 49 \times 4 = 196 \times \pi \tag{3}$$

$$\text{Volume of hemisphere} = \frac{2}{3} \times \pi \times r^3 = \frac{2}{3} \times \pi \times 49 \times 4 = \frac{392}{3} \times \pi \tag{4}$$

$\therefore$From the above equations,
Volume of the figure $= \frac{196}{3} \times \pi + 196 \times \pi + \frac{392}{3} \times \pi$
$\implies$ Volume of the figure $= 490 \times \pi \approx 1539.38 cm^3$