Class 10-Mathematics

Instructions for students: The notes provided must be copied to the Maths copy and then do the homework in the same copy.

Chapter 17

MENSURATION (Part - 6)

CONVERSION OF SOLID FROM ONE SHAPE TO ANOTHER

When a solid is converted from one shape to another, its volume remains same, but the surface area changes.

Exercise 17.5

5. Radius of cylindrical vessel = 1 m

Height of cylindrical vessel = 3.5 m

Volume of water = Volume of cylindrical vessel

= $\pi r^2 h$

= $\frac{22}{7} \times 1 \times 3.5$

= 11 m^3

Height of water on roof = $\frac{Volume\ of\ water}{Length \times breadth}$

= $\frac{11}{22 \times 20}$ = $\frac{1}{40}$ m = $\frac{10}{4}$ cm = 2.5 cm

Rain fall = 2.5 cm

8. Radius of the metallic disk = 12 cm

Height = 2.5 mm = .25 cm= $\frac{1}{4}$ cm

Volume = $\pi r^2 h$

= $\pi \times 144 \times \frac{1}{4} = 36\pi$

Volume of sphere = $\frac{4}{3}\ \pi r^3$

Volume of sphere = Volume of disc (Cylinder)

$\frac{4}{3}\ \pi r^3$ = 36π

r^3 = $36 \times \frac{3}{4}$

= 27

Radius of sphere, r = $\sqrt[3]{27}$ = 3 cm

12. Internal radius of metallic cylindrical tube, r= 3 cm

Thickness = $\frac{1}{2}$ cm = .5 cm

External radius, R = 3.5 cm

Height , h = 21 cm.

Volume = $\pi(R^2 - r^2)h$

= $\pi((3.5)^2 - 3^2)21$

= $\pi(12.25 - 3)\times 21$

= $\pi\times 3.25\times 21$

Height of the cone made = 7 cm

Radius = ?

Volume of cone = $\frac{1}{3}\pi r^2 h$

= $\frac{1}{3}\times \pi \times r^2 \times 7$

Volume of cone = Volume of tube

$\frac{1}{3}\times \pi \times r^2 \times 7$ = $\pi\times 3.25\times 21$

r^2 = $\frac{3.25\times 21\times 3}{7}$

= 3.25×9 = 29.25

r = $\sqrt{29.25}$

= 5.4 cm approx.

Home Work: Solve Exercise **17.5** questions 1 to 15 in the Maths copy.