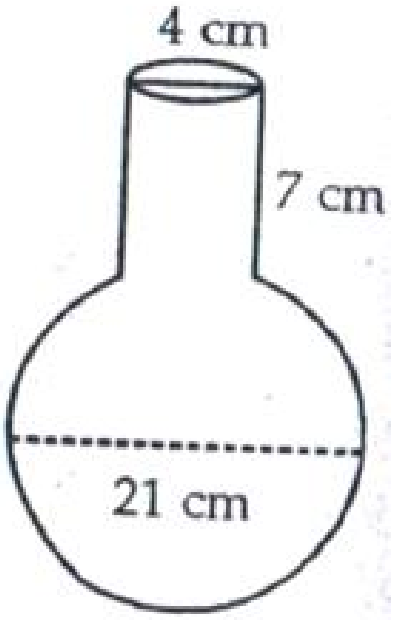
Exercise 19A

Question 16:



Diameter of spherical part of vessel = 21 cm

Its radius = $\frac{21}{2}$ cm

Its volume = $\frac{4}{3}\pi r^3$

$= \frac{4}{3} \times \frac{22}{7} \times \frac{21}{2} \times \frac{21}{2} \times \frac{21}{2}$

$= 11 \times 21 \times 21 \text{ cm}^3 = 4851 \text{ cm}^3$

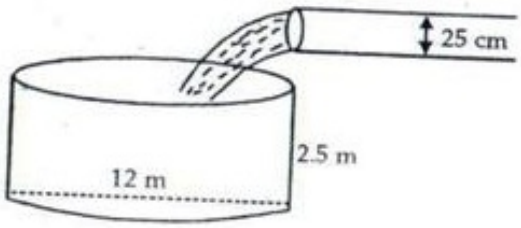
Volume of cylindrical part of vessel

$= \pi r^2 h = \frac{22}{7} \times 2 \times 2 \times 7 \text{ cm}^3$

$= 88 \text{ cm}^3$

$\therefore$ Volume of whole vessel $= (4851 + 88)\text{cm}^3 = 4939 \text{ cm}^3$

Question 17:



Height of cylindrical tank = 2.5 m
Its diameter = 12 m, Radius = 6 m

Volume of tank = $\pi r^2 h = \frac{22}{7} \times 6 \times 6 \times 2.5\, m^3 = \frac{1980}{7}\, m^3$

Water is flowing at the rate of 3.6 km/ hr = 3600 m/hr
Diameter of pipe = 25 cm, radius = 0.125 m
Volume of water flowing per hour

$$= \frac{22}{7} \times 0.125 \times 0.125 \times 3600\ m^3$$

$$= \frac{22 \times 3600}{7 \times 8 \times 8}\, m^3 = \frac{2475}{14}\, m^3$$

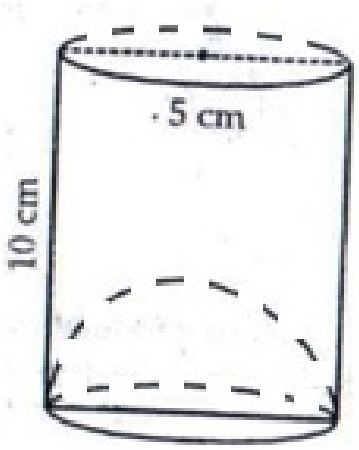
Time taken to fill the tank $= \frac{1980}{7} \div \frac{2475}{14}$ hr

$$= \frac{1980}{7} \times \frac{14}{2475}\, hr = \frac{792}{495}\, hr$$

$= 1.36$ hr $= 1$ hr 36 min.

Water charges $= Rs. \frac{1980}{7} \times 0.07 = Rs.19.80$

Question 18:



Diameter of cylinder = 5 cm
Radius = 2.5 cm
Height of cylinder = 10 cm
Volume of cylinder = $\pi r^2 h$ cu.units = $3.14 \times 2.5 \times 2.5 \times 10$ cm^3 = 196.25 cm^3
Apparent capacity of glass = 196.25
Radius of hemisphere = 2.5 cm
Volume of hemisphere

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

$$= \frac{2}{3} \times 3.14 \times 2.5 \times 2.5 \times 2.5\ cm^3$$

$$= 32.708\ cm^3$$

Actual capacity of glass = (196.25 - 32.608) cm^3 = 163.54 cm^3

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