

1.92:- A cylinder container is 150 mm in diameter and weighs 2.25 N when empty. When filled to a depth of 200 mm with a certain oil, it weighs 35.4 N. Calculate the specific gravity of the oil.

$$\text{Weight}_{\text{oil}} = 35.4 - 2.25 = \underline{33.15 \text{ N}}$$

$$= (33.15) (1 \text{ kN} / 1000 \text{ N}) = \underline{0.03315 \text{ kN}}$$

$$\begin{aligned} \text{Volume}_{\text{cylinder}} &= \pi \times \cancel{0.075}^2 \times 0.02 = 0.000353429 \\ &= \underline{3.534 \times 10^{-3} \text{ m}^3} \end{aligned}$$

$$\gamma = \frac{W}{V} = \frac{33.15}{3.534 \times 10^{-3}} = 9380.3 = \underline{9.38 \text{ kN/m}^3}$$

$$sg = \frac{\gamma_s}{\gamma_w @ 4^\circ \text{C}} = \frac{\rho_s}{\rho_w @ 4^\circ \text{C}}$$

$$\boxed{sg = \frac{9.38}{9.81} = \underline{0.9561}}$$

1.107: Alcohol has a specific gravity of 0.79. Calculate its density both in slugs/ft³ and g/cm³.

$$\rho = (0.79)(1.94) = \underline{1.5326 \text{ slugs/ft}^3}$$

$$\rho = (1.5326)(0.515/1) = 0.789 \approx \underline{0.79 \text{ g/cm}^3}$$