

Mechanics of fluids

Std - XI

1. Define coefficient of viscosity. Give its S.I unit and dimensions.
2. State Stokes law.
3. Explain how does a body attain a terminal velocity when it is dropped from rest in a viscous medium. Derive an expression for the terminal velocity of a small spherical body falling through a viscous medium.
4. Which falls faster - big rain drops or small rain drops?
5. Hotter liquids move faster than colder liquids. Why?
6. Explain surface tension on the basis of molecular theory.
7. Derive an expression for excess pressure inside a liquid drop and a soap bubble.
8. What is capillarity? Derive an expression for the rise of liquid in a capillary tube and show that the height of the liquid column supported is inversely proportional to the radius of the tube.
9. Two soap bubbles have radii in the ratio 2:3. Compare the excess of pressure inside these bubbles. Also compare the work done in blowing these bubbles.
10. Teflon is coated on the surface of non sticking pans. Why?
11. The paints and lubricating oils have low surface tension. Why?
12. Calculate the height to which water will rise in a capillary tube of 1.5mm diameter. Surface tension of water is $7.4 \times 10^{-3} \text{ N/m}$.