

## Scope Tuition centre

### Class Test: Physics (Properties of fluid & Thermodynamics)

Total marks: 50

---

#### One-mark questions:

1. Define Hydraulic Pressure
2. Define Buoyancy force
3. Mention any two application of surface tension
4. Define Thermodynamic equilibrium
5. What are the characteristics of non-viscous fluids?
6. What is the physical significance of first law of thermodynamics?

#### Two- mark questions:

7. State and explain Stokes law
8. Distinguish between Streamline flow and turbulent flow
9. State and explain first law of thermodynamics
10. Differentiate between Isothermal process and Adiabatic process.
11. What is refrigerator? Define coefficient of performance

#### Three Mark Questions

12. Explain how Pascal's law is applied in hydraulic lift.
13. State and explain equation of continuity
14. Draw P-V diagram of Carnot heat engine

#### Five-mark questions

15. Water is filled in a flask up to a height of 0.2m. The bottom of the flask is circular with radius 0.1 m. Find the force exerted by the water on the bottom. ( $1 \text{ atm} = 1.01 \times 10^5 \text{ Pa}$ , density =  $1000 \text{ kg/m}^3$ )
16. Derive the expression for efficiency of Carnot engine
17. An electric heater supplies heat to a system at a rate of 100W. If a system performs work at a rate of 75 Joules per second, at what rate is the internal energy increasing?
18. A Carnot heat engine absorbs 100J of heat energy from a reservoir at  $127^\circ\text{C}$  and rejects 60J of heat energy during each cycle. Calculate i) Efficiency of the heat engine ii) Temperature of the sink iii) Amount of useful work done per cycle
19. A multi-story building has an overhead water tank connected to taps on each floor. The pressure of water at the ground floor is  $196000 \text{ Pa}$  and on the third floor is  $98000 \text{ Pa}$ . Find the height of the third floor (given density of water =  $1000 \text{ kg/m}^3$ )