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Basics of Thermodynamics & Fluid Mechanics Important 10 Mark questions

<u>Unit I</u>

- 1. Explain the various types of thermodynamic systems with examples.
- During a flow process 5kW paddle wheel work is supplied while the internal energy of the system increases in one minute is 200kJ. Find the heat transfer when there is no other form of energy transfer.

<u>Unit II</u>

- 1. A gas having molecular weight 28 occupies a volume of $0.1 m^3$ at a pressure of 2 bar and a temperature of 20° C. Find the mass, volume and density of the gas at 0° C and 1 bar pressure.
- 2. 0.5kg of air at a pressure of 1 bar occupies a volume of $0.4 m^3$. If this air expands insentropically to a volume of $0.8 m^3$, Find (i) Initial temperature, (ii) External work done, (iii) Change in internal energy. Assume R=0.29 kJ/kg ⁰K.

<u>Unit III</u>

- 1. With a neat sketch explain the working principle of centrifugal pump.
- 2. Explain the working principle, merits and demerits of closed cycle gas turbine with neat sketch.

<u>Unit IV</u>

- 1. Explain the working of Bourdon tube pressure gauge with a neat sketch.
- 2. Explain the construction and working principle of hydraulic jack with a sketch.

<u>Unit V</u>

- 1. Prove that the maximum efficiency of power transmission through fluid is 66.7%.
- 2. Derive the Darcy Weisbach equation for the loss of head due to friction.