4TH SEM. /AERO./AME/DME/MECH(MAIN.)/MECH(PROD.)/ MECH(SAND.)/ MECH./ MECH(IND.INT.)/ 2024(S)

Th-3 Fluid Mechanics

Full Marks: 80 **Time- 03 Hrs**

Answer any FIVE Questions including Q No.1 & 2
Figures in the right-hand margin indicates marks

1. Answer All questions 2 x 10
   a. State Pascal's Law.
   b. Define Specific weight and specific gravity.
   c. What is the significance of velocity triangle in a fluid flow?
   d. Define fluid with examples.
   e. What is Capillarity?
   f. What are the losses in pipes?
   g. Classify manometers.
   h. Define hydrostatic pressure.
   i. What is the function of an orifice? Mention its applications.
   j. Classify Fluid Flow.

2. Answer **Any Six** Questions 6 x 5
   a. Compare Dynamic viscosity with Kinematic viscosity.
   b. Water is flowing in an open channel at a depth of 2 m and a velocity of 3 m/s. It flows down a chute into another channel where the depth is 1 m and the velocity is 10 m/s. Neglecting friction, determine the difference in elevation of the channel floors.
   c. Discuss about Darcy's and Chezy's formula.
   d. Derive the Discharge over a rectangular notch.
   e. State and prove Continuity equation.
   f. Classify notches & weirs. Why these are needed in a fluid flow?
   g. Discuss about Hydraulic gradient line and total gradient line.

3. Derive the expression of work done & efficiency for Impact of jet on moving curved vanes. 10

4. Discuss about Archimedes 'principle'. Explain concept of buoyancy. 10

5. Explain different types of pressures with neat sketch. 10

6. State and prove Bernoulli's equation. 10

7. Write short notes on 10
   a) Surface Tension
   b) Concept of floatation