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Name: .....

Reg. No. .....



**FOURTH SEMESTER B.TECH. DEGREE EXAMINATION, DECEMBER 2010**

**CE.09.403/PTCE.09.402 – Fluid Mechanics**

**Time: Three hours** **Maximum: 70 marks**

## PART – A

1. Define surface tension.
2. If one litre of oil weighs 950 gm, calculate the specific gravity.
3. Give the Bernoulli's equation in terms of head.
4. Differentiate between laminar and turbulent flow.
5. What is the physical significance of Reynold's number?

**(5x2=10 marks)**

## PART – B

1. What is meant by absolute pressure and gauge pressure? Write the difference between Gauge pressure and absolute pressure.
2. Define fluid. Write about types of fluids.
3. Brief the application of Bernoulli's equation.
4. Explain the functions of pilot tube and peandtl tube.
5. Explain in brief about Hagen Poisuille's equation.
6. Define the terms: boundary layer thickness, Deag and Lift.

**(4x5=20 marks)**

## PART – C

1. a. Discuss the influence of the following fluid properties on fluid motion.
   (i). Viscosity (ii). Specific gravity (iii). Bulk modulus.
   b. What would be the pressure in $kN/m^2$ if the equivalent head is measured as 400 mm of (i). mercury p=13.6 (ii). water (iii). Oil specific weight 7.9 $kN/m^3$ (iv). a liquid of density 520 $Kg/m^3$ ?

OR

2. (i). Explain briefly the working principle of mechanical pressure gauge with a neat Sketch.
   (ii). What will be (i). the gauge pressure and (ii). the absolute pressure of water at depth 12 m below the surface? Density of water = 1000 $kg/m^3$, and P = atmosphere = 101 $kN/m^2$.

3. State and explain about Euler equation. Write the applications of Euler equation.

OR

4. (a). What are the advantages of venturimeter over orifice meter? Explain with a neat sketch.
   (b). A horizontal venturimeter with inlet and outlet diameter 30 cm and 15 cm respectively is used to measure the flow of water. The reading of differential manometer connected to the inlet and throat is 20 cm of mercury. Determine the rate of flow. Take cd = 0.98.

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5. List out the various major and minor losses takes place in a pipeline? Explain in detail.

**OR**

6. Find the loss of head when a pipe diameter 200 mm is suddenly enlarged to a diameter of 400 mm. The rate of flow of water through the pipe is 250 litres/second.

7. Find the thickness of the boundary layer at the end of the plate and the drag force on one side of the plate 1 m long and 0.8 m wide when placed in water flowing with a velocity of 150 mm/sec. Calculate the coefficient of drag also. Take kinematic viscosity of water is 0.01 $Ns/m^2$.

**OR**

8. Explain in detail with a neat sketch the description of "Boundary layer".

**(4x10=40 marks)**

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