Printed Pages : 3

ECE-509

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 132501

Roll No.

B. Tech.

(SEM. V) (ODD SEM.) THEORY EXAMINATION, 2014-15

FLUID MECHANICS

Time : **2** Hours] [Total Marks : **50**

1. Attempt ANY Four Questions **3.5×4=14**

(a) Explain the following.
- (i) Viscosity
- (ii) Rotational flow
- (ii) Nozzles

(b) Define the following terms.
- (i) Steady and unsteady flow
- (ii) Two dimensional flow
- (iii) Uniform and non-uniform flow
- (iv) Laminar and Turbulent flow

(c) A circular disc 3m in diameter is held normal to a 26.4m/s wind of density 0.0012gm/cc. what force is required to hold it at rest? Assume co-efficient of drag of disc= 1.1

(d) Three immiscible liquid of density p, 2p and 3p are kept in a jar the height of liquid in jar and piezometer are fitted to the bottom of jar is given in Figure-1 find H/h.

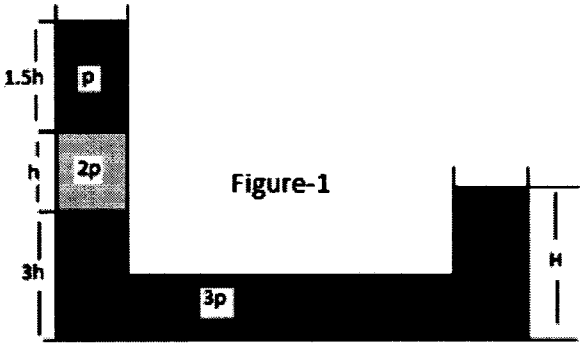

Figure-1

(e) Explain HOT wire anemometer.

(f) Differentiate between Langrangian and Eulerian approaches.

2. Attempt Any TWO Questions. **6x2=12**

(a) Explain Buckingham's Theorem in details with example.

(b) Drive an expression for flow through pipes in parallel with neat sketch.

(c) Water is flowing through a horizontal pipe of diameter 200mm at a velocity of 3m/s. A circular solid plate of dia.150mm is placed in the pipe to obstruct the flow. Find the loss of head due to obstruction in the pipe if C_c =0.62.

3. Attempt Any TWO Questions. 6x2=12

(a) Drive an expression for Bernoulli's equation also give its applications.

(b) Drive an expression for Pitot tube and also give its application.

(c) At a point "A" in a pipe line carrying water the diameter is lm, pressure is 98Kpa and the velocity is lm/s. At point `B" 2m higher than "A" the diameter is 0.5m and the pressure is 20Kpa. Find the direction of flow of fluid in Figure-2.

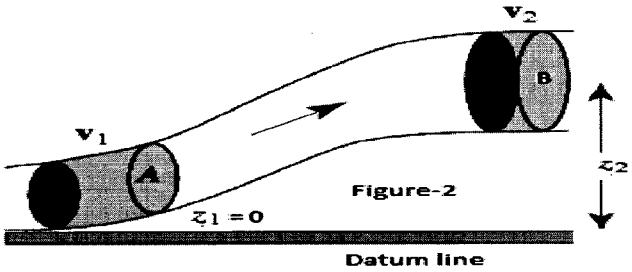

Figure-2

4. Attempt Any TWO Questions. 6x2=12

(a) Drive an expression for flow of viscous fluid between two parallel plates.

(b) Describe the following term stream line, streak line path line with neat sketches. Also drive an expression for Darcy-Weisbach formula.

(c) Define Reynold number in detail. What is its importance in fluid flow?