Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

Roll No .....

AU/ME-4002 (CBGS)

B.E. IV Semester

Examination, May 2018

Choice Based Grading System (CBGS)

Fluid Mechanics

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) Differentiate between 7
   i) Simple manometer and differentiate manometer
   ii) Piezometer and pressure gauge
   b) A tank contains water upto a height of 0.5 m above the base. An immiscible liquid of sp.gr. 0.8 is filled on the top of water upto 1 m height. Calculate: 7
   i) total pressure on one side of the tank
   ii) the position of centre of pressure for one side of the tank, which is 2m wide.

2. a) Write about flow net and its applications. 7
   b) Derive the continuity equation for three dimensional flow. 7

3. a) State Bernoulli's theorem. Mention the assumptions made 7
   b) The head of water over a rectangular notch is 900 mm. The discharge is 300 lit/sec. Find the length of the notch when Cd = 0.62. 7

   a) What do you mean by dimensionless numbers? Name any four dimensionless numbers. 5
   b) Find the displacement thickness the momentum thickness and energy thickness for the velocity distribution in the boundary layer given by $\frac{u}{U} = \frac{y}{\delta}$, where u is the velocity at a distance y from the plate and $u = U$ at $y = \delta$, where δ = boundary layer thickness, also calculate the value of δ^*/θ. 9

5. a) What do you understand by laminar flow? What factor decides the type of flow in pipes? 7
   b) Obtain an expression for velocity distribution in terms of average velocity for smooth pipes. 7

6. What is orifice meter? Derive an expression for finding discharge through orifice meter. 14

7. a) Explain about velocity potential and stream function. 6
   b) Write about : 8
   i) path lines
   ii) streak lines
   iii) stream lines and stream tube

8. a) Find the volume of the water displaced and position of center of buoyancy for a wooden block of width 2.5 m and depth 1.5 m, when it floats horizontally in water. The density of wooden block is 650 kg/m^3 and its length 6.0 m. 7
   b) Explain about Reynolds experiment and significance of Reynold number. 7

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