

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
 - ANSWER** i) Simple manometer and differential manometer
 - ANSWER** 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. **ANSWER** 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

- 4. a) What do you mean by dimensionless numbers? Name any four dimensionless numbers. 5
ANSWER
- 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
ANSWER
- b) Write about : 8
 - i) path lines
 - ii) streak lines **ANSWER**
 - 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/m³ and its length 6.0 m. 7
- b) Explain about Reynolds experiment and significance of Reynold number. 7
