

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (CE) (Sem.-3rd)
FLUID MECHANICS-I
 Subject Code : CE-203
 Paper ID : [A0602]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A**I. Answer briefly :**

- (a) Define Newtonian Fluid.
- (b) Calculate specific gravity of one litre of a liquid which weighs 7N.
- (c) What do you mean by Total Pressure ?
- (d) Define Flow Net.
- (e) Define Archimedes Principle of Buoyancy.
- (f) What is kinetic energy correction factor ?
- (g) Give units of Modulus of Elasticity. Also write its dimensional formula in terms of M, L & T.
- (h) What is the advantage of Cippoletti Weir?
- (i) Define Reynold Number.
- (j) What is Coefficient of Discharge ?

SECTION-B

2. Determine the minimum size of glass tube in which water level if the capillary rise in the tube is 1.5 m. Consider surface tension of water in contact with glass is 0.075 N/m.
3. A rectangular plane surface 2 m wide and 3 m high is inclined in a way that its plane makes an angle of 30° with the horizontal. Determine the total pressure and centre of pressure if the free water surface is 1.5 m below the free water surface.
4. How would you determine experimentally the coefficient of friction of a body? Explain with neat sketch.
5. Prove that in the case of Forced Vortex flow the angular velocity is equal to fall of liquid level at the ends.
6. (a) A rectangular channel 2.0 m wide has a V-notch at the bottom. The depth of notch is measured by a right angled V-notch. The depth of notch from the bed of channel, if the depth of water exceeds 1.3 m. Take coefficient of discharge as 0.62.
- (b) Give advantages of Triangular notch.

SECTION-C

7. What are the methods of Dimensional Analysis? State one method for Dimensional Analysis.
8. State Bernoulli Theorem. Mention the assumptions made while applying in practice? Give some applications.
9. Two pipes one of Diameter D_1 and other of Diameter D_2 and length have a constant value of pipe coefficient of friction. In parallel, the loss of head is H_1 and when in series, the loss of head is H_2 for the same quantity of flow. Find the ratio of $\frac{H_2}{H_1}$ neglecting secondary losses.