

Roll No.

3028

**B. Tech. 3rd Semester (Civil Engg.)
Examination – March, 2021**

FLUID MECHANICS

Paper : PCC-CE-205-G

Time : Three Hours]

[Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt five questions in all, selecting one question from each Section. Question No. 1 is compulsory. All questions carry equal marks.

1. Explain the following : $3 \times 5 = 15$
- (a) Effect of pressure on viscosity of liquid.
 - (b) Hydrostatic Pressure.
 - (c) Different flow lines.
 - (d) Assumptions of Bernoulli's equation.
 - (e) Similar and distorted models.

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SECTION - A

2. (a) Describe and derive Hydrostatic law. 8 + 7 = 15
(b) Describe and derive Pascal's law.
3. What is Capillarity ? Write down the factors affecting capillarity. And derive an expression for capillary rise and fall. 15

SECTION - B

4. Derive a detailed expression to describe the Total pressure and centre of pressure on vertical plane, vertical triangular and vertical trapezoidal submerged surfaces. 15
5. A u-tube differential manometer connects two pressure pipes A and B. The pipe A contains carbon tetra chloride having a specific gravity of 1.594 under a pressure of 117720 N/m². The pipe B contains oil of specific gravity 0.8 under a pressure of 197720 N/m². The pipe A lies 2.5m above pipe B. Find the difference of pressure measured by mercury as fluid filling u-tube. 15

SECTION - C

6. Classify and explain different kinds of fluid flow in details. 15
7. Explain Bernoulli's theorem. Derive an expression for Bernoulli's theorem. Write down the assumptions and limitation of Bernoulli's equation. 15

SECTION - D

8. (a) Describe in details : Boundary-layer thickness, Laminar boundary, Laminar sub-layer boundary. 10
(b) Write down local and average friction coefficients of boundary layer analysis. 5
9. (a) Explain hydraulic similitude. And describe geometric, kinematic and dynamic similarities in details. 10
(b) Describe physical modeling. 5