SEAT No. :

P-5377

[6186]-503

S.E. (Civil) (Insem)

FLUID MECHANICS

(2019 Pattern) (Semester - III) (201003)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) *Answer Q.1 or Q.2, Q.3 or Q.4.*

2) *Figures to the right indicate full marks.*

3) *Neat diagrams must be drawn wherever necessary.*

4) *Assume suitable data if required.*

5) *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator (nonprogrammable) and steam tables is allowed.*

Q1) a) If density of a liquid is 837 kg/m³ find its: - **[5]**

  i) specific weight,

  ii) secific gravity and

  iii) specific volume. If kinematic viscosity of this liquid is 1.73 cm²/sec, obtain its dynamic viscosity.

  b) Differentiate between "Surface Tension" and "Capillarity". Give practical example of each. **[5]**

  c) Define "Metacenter" and "Metacentric Height". How they are important in case of floating body. **[5]**

OR

Q2) a) Five liters of oil weights 61.80 N. Calculate (i) Specific Weight, (ii) Specific Mass, (iii) Specific volume and (iv) Relative Density. **[5]**

  b) What is kinematic viscosity? Why it is so called? Give its units and dimensions. **[5]**

  c) Explain with neat sketches various conditions of equilibrium related to stability of floating body. **[5]**

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Q3) a) Define: (i) Path Line (ii) Stream Line (iii) Stream Tube (iv) Streak Line.**[5]**

b) Derive the continuity equation for three-dimensional flow. **[5]**

c) Sketch a Pitot tube and explain how it is used to measure the velocity of flowing fluid. **[5]**

OR

Q4) a) Enlist different types of fluid flows and explain anyone in detail. **[5]**

b) Derive the "Euler's Equation of Motion" along a stream tube. **[5]**

c) Oil of specific gravity 0.8 flows in a horizontal pipe at a height of 3 m above a datum plane. At a section of the pipe, diameter is 120 mm and the pressure intensity is 125 KN/m². If the total energy at the section is 25 m, find the rate of flow of oil. **[5]**

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