

Total No. of Questions : 4]

SEAT No. :

P-5377

[Total No. of Pages : 2

[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/m^3 find its: - [5]

- i) specific weight,
 - ii) specific gravity and
 - iii) specific volume. If kinematic viscosity of this liquid is $1.73 \text{ cm}^2/\text{sec}$, 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]

P.T.O.

- 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]

~ ~ ~