Total No. of Questions : 4]

SEAT No. :

**PC-383**

[Total No. of Pages : 2

# [6359]-503
# S.E. (Civil Engineering) (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) ***Answer to the all questions should be written in single answer book.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator (non programmable) and steam tables is allowed.***
6) ***Assume suitable data, if necessary.***

***Q1)*** a) Define i) Specific Gravity ii) Specific Volume iii) Vapor pressure iv) Mass Density v) Capillarity vi) Viscosity vii) Surface Tension viii) Specific Weight. **[8]**

b) Derive the expression with usual notations for the total pressure and centre of pressure on inclined plane surface. **[7]**

OR

***Q2)*** a) Calculate the specific weight, specific mass, specific volume and specific gravity of a liquid having a volume of 6 $m^3$ and weight 45 kN. **[5]**

b) Differentiate between Real Fluid and Ideal Fluid. **[2]**

c) A 3.6 m by 1.5 m wide rectangular gate BC is vertical and is hinged at point 0.15 m below the centre of gravity of the gate. The total depth of water is 6.1 m What horizontal force must be applied at the bottom of the gate to the keep the gate closed? **[8]**

***Q3)*** a) The water is flowing through a tapering pipe having diameters 300 mm and 150 mm at section 1 and 2 respectively. The discharge through the pipe is 42 lit/s. The section 1 is 10 m above datum and section 2 is 6 m above datum. Find the pressure at section 2 if that at section 1 is 401 $kN/m^2$. **[7]**

b) Derive the continuity equation for three-dimensional flow with usual notations. **[8]**

OR

***P.T.O.***

***Q4)*** a) Explain in brief with neat sketch : i) Venturimeter ii) Pitot Tube iii) Rotameter. **[3+3+2=8]**

b) For a two-dimensional flow $\phi = 3xy$ and $\varphi = \frac{3}{2}(y^2 - x^2)$. Determine the velocity components at the points (1, 3) and (3, 3). Also, find the discharge passing through the points given above. **[7]**

▽▽▽▽