PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Summer 2017 - 18 Examination

Semester: 3   Date: 12/06/2018
Subject Code: 03101203   Time: 2.00 pm to 4.30 pm
Subject Name: Fundamentals of Fluid Mechanics   Total Marks: 60

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions   **(15)**
1. 1 Pa.s = _____ poise
2. Piezometer is used to measure _____.
3. Fluid is a substance that cannot resist _____ forces.
4. Stability of a submerge body depends on the location of _____ and _____ .
5. The flow where the flow properties do not vary with space is called _____ flow.
6. What is coefficient of surface tension?
7. Define Metacentric Height
8. State Pascal's law.
9. What do you mean by a Non-Dimensional number?
10. What do you understand by Steady fluid flow?
11. The buoyancy force on a floating body is _____the weight of the fluid displaced.
    (a) less than   (b) greater than   (c) equal to   (d) None of the above
12. Kinematic viscosity of the fluid is _____.
    (a) The ratio of dynamic viscosity to the density of the liquid.
    (b) ratio of density of the liquid to the absolute viscosity
    (c) product of absolute viscosity and density of the liquid
    (d) product of absolute viscosity and mass of the liquid

13. The line of action of the buoyancy force acts through the,
    (a) center of gravity of any submerged body   (b) centroid of the volume of any floating body
    (c) centroid of the displaced volume of fluid   (d) centroid of the horizontal projection of the body
14. Water rises to a height of 20 mm in a capillary tube of 10 mm radius. The corresponding rise in a
    capillary of 5 mm radius would be ___.
    (a) 3.87 mm   (b) 7.5mm   (c) 15 mm   (d) 40 mm
15. What is the unit of dynamic viscosity?
    (a) Pa.s   (b) Nm   (c) kg.s   (d) None of the above

Q.2 Answer the following questions. (Attempt any three)   **(15)**
A) Define the following
   (i) Density (ii) Specific volume (iii) Specific gravity (iv) Bulk Modulus (v) Metacentre
B) Prove Pascal's Law
C) A plate 0.025 mm distance from a fixed plate, moves at 60 cm/s and requires a force of 2 N/m^2 to
   maintain the speed. Determine the fluid viscosity between the plates.
D) Explain the construction and working of a simple U-tube manometer.

Q.3 A) Explain Stability criteria of a submerged body   **(07)**
B) Explain in brief the Geometric, Kinematic and Dynamic similarity.   **(08)**

OR

B) Derive generalized form of continuity equation.   **(08)**

Q.4 A) Explain the types of fluid flows in detail.   **(07)**

OR

A) Derive and explain Bernoulli's equation.   **(07)**
B) Define Streamline, Streakline and pathline. Also explain them in brief.   **(08)**