PARUL UNIVERSITY
FACULTY OF AGRICULTURE
B.Tech. (Dairy Technology) Summer 2018 - 19 Examination

Semester: 1   **Date: 18/04/2019**
Subject Code: 20104102   **Time: 2:00 pm to 4:00 pm**
Subject Name: Fluid Mechanics   **Total Marks: 50**

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

A) **Fill in the blanks (Each of 0.5 Mark)**   **(05)**

    i)   Unit of specific volume is _____.

    ii)   1 stoke = _____ m^2/s

    iii)   Property of a fluid by which its own molecules are attracted is called_____.(Adhesion or cohesion)

    iv)   1 poise is equal to_____ $\frac{Ns}{m^2}$

    v)   1 bar =_____Pascal

    vi)   If the fluid flow through pipe and Reynolds number is less than 2000 then flow is called _____.(Laminar or turbulent)

    vii)   Pitot tube is used to measure_____.

    viii) Fluid which is compressible has viscosity and surface tension is known as _____fluid.

    ix)   Unit of specific weight _____.

    x)   Unit of pressure is _____.

B) **Multiple Choice Questions (Each of 0.5 Mark)**   **(10)**

    i)   Surface tension is caused by a force of _____ at the free surface.

         (a) Adhesion (b)Cohesion (c) Both a and b (d) None of the above

    ii)   Differential manometer is used to measure

         (a) Pressure difference between two points in the same pipe line

         (b) Pressure difference between two pipes

         (c) Pressure difference between two pipes, provided they contain same liquid

         (d) All of the above

iii)   Any Pressure measured above absolute Zero is known as

      (a) Atmospheric Pressure   (b) Absolute Pressure

      (c) Gauge Pressure   (d) Vacuum Pressure

iv)   Unit of Kinematic Viscosity

    a) Pa   b) kg/(ms)   c) stoke   d) poise

v)   Newton's law of viscosity relates to

a) pressure, velocity & viscosity

b) shear stress and rate of angular deformation in a fluid

c) pressure, temperature, viscosity and velocity

d) None of the above

vi)   Property of a fluid by which fluid stick to the wall is called

    a) Adhesion b) Cohesion c) Viscosity d) compressibility

vii)   Kinematic viscosity is the ratio of dynamic viscosity to _____.

    a) Pressure b) Distance c) Flow d) Density

viii)   Falling drops of water becomes spherical because of _____.

    a) Surface tension b) Cohesion c) Adhesion d) Viscosity

ix)   An ideal fluid is one which

    (a) is compressible   (b) has no viscosity

    (c) is elastic and viscous   (d) is non-viscous and incompressible

x)   Standard atmospheric pressure in terms of water column is _____.

    a) 9.81 m b) 10.34 m c) 8.75 m d) 12.35 m

xi)   Ball pen works on the principle of

    a) Viscosity b) Surface tension c) Gravitational Force d) Boyle's law

xii)   Local atmospheric pressure is measured by

    a) Manometer b) Bourdon gauge c) Mercury manometer d) Vacuum gauge

xiii)   If velocity in a fluid is flow does not change with respect to length of direction of flow, it is called_____

      a) Uniform flow b) steady flow   c) Incompressible flow d)Rotational flow

xiv)   Unit of Surface tension is

      a) N/m   b) N/m^2 c) N/m^3 d) none of these

xv)   The upper surface of a weir over which water flows is known as

      a) Nappe   b) crest   c) edge d) weir top

xvi)   Centrifugal pumps transfer energy from _____.
      a) Rotor to fluid   b) Fluid to rotor   c) Draft to rotor   d) Rotor to draft

xvii)   Orifice meter is used to measure

      a) Discharge b) Average velocity c) Velocity at point d) Pressure

xviii) Which of the following is not the assumption made in Bernoulli's equation?

      a) Fluid is an ideal   b) Fluid is compressible

      c)Flow is irrotational   d) Flow is steady

xix)   Venturimeter is used to measure

      a) Pressure   b) Velocity   c) Discharge d) none of the above

xx)   Capillary depression in mercury is due to

      a) Adhesion being greater than cohesion

      b) Surface tension is being greater than viscosity

      c) Cohesion is being greater than adhesion

      d) Vapour pressure being small

Q.2

A)   **Define the following (Any five out of seven questions)**   **(05)**
(1)   Define: Pressure head.
(2)   Define: Reynolds number.
(3)   Define : Pascal's law
(4)   Define: Capillarity
(5)   Define: Steady flow
(6)   Define: Non-Newtonian fluid
(7)   Define: Viscosity

B)   **Answer the following (Any five out of seven questions)**   **(05)**
(1)   What is hydrostatic law?
(2)   What is weber number?
(3)   What is vena contracta?
(4)   What is use of Rota meter?

(5)   What is surface tension?

(6)   What is function of Pump?

(7)   Write one application of Bernoulli's equation.

Q.3   Write Short notes (Any five out of six questions)   **(10)**

(1)   What is difference between positive displacement and dynamic pump?

(2)   Write classification of fluid flow.

(3)   Explain different types of pressures and their relationship drawing a neat sketch.

(4)   For a liquid having mass 2000 kg and volume 2.5 m^3, calculate mass density and weight density.

(5)   Convert the following:
120 KN/m^2 in pressure head of liquid having specific gravity of 1.2.

(6)   Explain working of piezometer.

Q.4   Long Questions (Any three out of four questions)   **(15)**

(1)   Derive Bernoulli's equation.

(2)   Explain construction and working of venturimeter with neat sketch.

(3)   What is manometer? Describe a differential U tube manometer with neat sketch.

(4)   Explain construction and working of reciprocating pump with neat sketch.