Seat No: _____ **Enrollment No: _____**

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

B.Tech. Summer 2018-19 Examination

Semester: 3 **Date: 31/05/2019**
Subject Code: 03110205 **Time: 02:00pm to 04:30pm**
Subject Name: Fluid Mechanics for Agricultural Engineers **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 - (All are compulsory) **(15)**

A) Fill in the blanks. **(05)**

1.The Reynolds number in pipe for Transition flow is _____
2.Unit of weight density is _____
3.Unit of pressure is _____
4.The depth of flow and discharge is not constant along length of channel is known as _____
5. A real fluid has _____viscosity.

B) One word answer. **(05)**

1. Define Surface Tension.
2. Define kinematics viscosity.
3. Write relation of newton's law of viscosity.
4. Convert 120 kilo Newton per meter square in pressure head of liquid having specific gravity 1.3.
5. Convert 1kgf into newton.

C) Multiple Choice Questions. **(05)**

1. During opening of a valve ,flow is
(a) Laminate (b) Unsteady (c) Uniform (d) Rotational
2. If density of fluid is not constant from point to point in a flow region it is called
(a) Rotational (b) Incompressible (c) Compressible (d) None
3. The unit of force
(a) Newton (b) Newton-sec (c) $(Meter)^2$ (d) Newton/Meter
4. Venturimeter meter is used to measure
(a) Rate of flow (b) Velocity (c) Pressure (d) None
5. Bernoulli's equation deals with the law of conservation of
(a) Flow (b) Mass (c) Density (d) Energy

Q.2 Answer the following questions. (Attempt any three) **(15)**

A) Explain classification of fluids.
B) The pressure outside the droplet of water of diameter 0.05 mm is 0.039 N/m^2 .calculate the pressure within the droplet is surface tension is 0.073 Newton per meter of water.
C) Explain the various types of fluid properties.
D) What is Capillarity? Where is the application of capillarity phenomenon?

Q.3 A) Derive the Bernoulli's equation & write it is assumption. **(07)**
B) Classify the types of flow and explain in brief. **(08)**

OR

B) Write difference between Reciprocating pump & Centrifugal pump. Explain the working of any one of the pump in details with a neat sketch. **(08)**

Q.4 A) A 30cm diameter pipe, conveying water, branches into two pipes of diameter s 20 cm & 15 cm respectively. If the velocity in the 30 cm diameter is 2.5 m/s, find the discharge in this pipe. Also determine the velocity in 15 cm pipe if the velocity in 20 cm diameter pipe is 2 m/s. **(07)**

OR

A) Explain in brief various losses in pipes **(07)**
B) A rectangular plate 2m wide and 5m long is immersed in water in such a way as (i) Horizontally 1m below the free surface of water (ii) vertically , 2m side is parallel to the water surface and 1 m below the free surface of water. Find (a) Total pressure on the plate (b) Position of center of pressure. **(08)**