

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (OLD) - EXAMINATION – SUMMER 2017****Subject Code: 130101****Date: 31/05/2017****Subject Name: Fluid Mechanics****Time: 10:30 AM to 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Define: 1) Specific Weight. 2) Mass Density. 3) Specific Gravity. 4) Viscosity. **07**
(b) Describe various types of fluid flows. **07**
- Q.2** (a) Define: 1) Atmospheric pressure. 2) Absolute pressure. 3) Gauge pressure. **07**
4) Vacuum pressure.
(b) Derive an expression for continuity equation for three dimensional flow. **07**
- OR**
- (b) The weight of 5m^3 of a certain oil is 50 KN. Calculate its Specific Weight, Mass Density and Specific Gravity. **07**
- Q.3** (a) How will you determine the meta-centric height of a floating body experimentally? **07**
(b) Define 1) Total pressure. 2) Centre of pressure. 3) Buoyancy. 4) Centre of buoyancy. **07**
- OR**
- Q.3** (a) Express intensity of 981KN/m^2 in all pressure units. Take barometer reading as 76 cm of mercury. **07**
(b) Describe Various types of fluid flows. **07**
- Q.4** (a) Derive an expression for Bernoulli's theorem and write assumptions made in it. **07**
(b) Water is flowing at a velocity of 5m/s and under pressure of 25KN/m^2 . If height above the datum is 5m. Calculate the total energy of water. **07**
- OR**
- Q.4** (a) Define: 1) Stream function. 2) Velocity potential function. 3) Convective acceleration. 4) Local acceleration. **07**
(b) Derive an expression for rate of flow through Venturimeter. **07**
- Q.5** (a) Find the discharge over a triangular notch of angle 60° when the head over the notch is 40cm. Assume $C_d = 0.9$ **07**
(b) Discuss the stability of submerged and floating body. **07**
- OR**
- Q.5** (a) Derive the expression of velocity of sound wave in fluid. **07**
(b) Define: 1) Kinetic energy correction factor. 2) Coefficient of discharge. **07**
3) Coefficient of velocity. 4) Stagnation pressure.
