

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (Old) EXAMINATION – WINTER 2019****Subject Code: 130602****Date: 28/11/2019****Subject Name: Fluid Mechanics****Time: 02:30 PM TO 05:00 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) What is orifice? Explain different methods to determine the coefficient of orifice. **07**
(b) What is mouthpiece? Explain convergent-divergent mouthpiece. **07**
- Q.2** (a) What is difference between notch and weir. Classify the weirs based on geometry of flow section and based on sharpness of the crest. **07**
(b) Derive Darcy-Weisbach formula for the loss of head due to friction in the pipe line. **07**
- OR**
- (b) What is difference between hydraulic gradient line and total energy line? Explain different types of losses for pipe flow. **07**
- Q.3** (a) What is hydro kinematics? Explain methods of describing fluid motion. **07**
(b) What is flow net? Describe different methods to obtain flow net in brief. **07**
- OR**
- Q.3** (a) State and derive Bernoulli's theorem. Write its limitations. **07**
(b) What is venturihead? Obtain the discharge equation for venturimeter. **07**
- Q.4** (a) Explain different properties of fluid in brief. **07**
(b) Differentiate between manometer and barometer. Explain different types of manometer. **07**
- OR**
- Q.4** (a) What is meant by centre of pressure? Obtain an expression for the depth of centre of pressure when the lamina is immersed in a liquid and is at an angle with the horizontal. **07**
(b) What is buoyancy? Define centre of buoyancy and metacenter. **07**
- Q.5** (a) Explain how the metacentric height of a floating body can be determined theoretically and experimentally. **07**
(b) Derive a continuity equation for three dimensional flow. **07**
- OR**
- Q.5** (a) What is compressible fluid flow? Derive an expression for velocity of pressure wave in the fluid. **07**
(b) Explain the different cases of pressure wave propagation in compressible fluid. **07**
