Seat No.: _____ **Enrolment No._____**

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. 4) Vaccum pressure.	**07**
	(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 it's 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 ass 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 60^0 when the head over the notch is 40cm. Assume cd = 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. 3) Coefficient of velocity. 4) Stagnation pressure.	**07**

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