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

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 141702 **Date: 12/06/2017**

Subject Name: Transducers

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)**	Explain below given terms with Example • Speed of response • Standard deviation • Resolution	**07**
	(b)	Explain working principle of LVDT with necessary schematic. Also enlist their merits and demerits.	**07**
Q.2	**(a)**	Explain Strain gauge (SG) load cell with SG placements and necessary circuits for electric interface.	**07**
	(b)	Enlist various methods for Torque measurement. Explain anyone in details.	**07**
		OR	
	(b)	Explain working principle of AC tachometer with necessary schematic.	**07**
Q.3	**(a)**	Explain concept of thickness measurement using reluctance variation transducer.	**07**
	(b)	What is the purpose of Density measurement? Explain any method for liquid density measurement.	**07**
		OR	
Q.3	**(a)**	Explain necessary instrumentation for diameter measurement of opaque rod using LASER.	**07**
	(b)	Define Viscosity. Enlist applications of viscometer. State Hagen-poiseuille Law for viscosity measurement.	**07**
Q.4	**(a)**	Explain pH electrode construction and Nearst equations for pH measurement.	**07**
	(b)	Draw schematic of capacitance level indicators. Derive necessary equations to relate change in capacitance with change in level.	**07**
		OR	
Q.4	**(a)**	Explain working principle of variable area flowmeter with merits and demerits.	**07**
	(b)	Explain application of Piezoelectric transducers for pressure measurement. Can we measure a constant pressure of 5 pascal using this transducers?	**07**
Q.5	**(a)**	Explain working principles of Thermocouple. Explain concept of cold junction compensation.	**07**
	(b)	Explain the concept of current telemetry system.	**07**
		OR	
Q.5	**(a)**	What is the difference between sensors and transducers? Enlist the considerable parameters for transducers selection.	**07**
	(b)	Explain the concepts of fiber optic temperature measurement system.	**07**

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