Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – SUMMER • 2014

Subject Code: 141702 **Date: 25-06-2014**

Subject Name: Transducers

Time: 10:30 am - 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)**	Justify the aim of measurement in the field of engineering. Explain each functional elements of an instrument in detail.	**07**
	(b)	Define following terms in 1to 3 lines only w.r.t instrument performance. (1) Static error (2) Range (3) Speed of response (4) Linearity (5) Resolution (6) Fidelity (7) System lag.	**07**
Q.2	**(a)**	(i) What is temperature as measuring variable? Define it. Also compare various temperature scales. (ii) Draw and Describe with limitation and benefits of mercury in glass thermometer.	**07**
	(b)	What is reference junction? Explain it with thermocouple based temperature measurement system with its law, limitation and advantages.	**07**
		OR	
	(b)	How industrial information transmitted? Explain working of current loop electrical transmitter along with its diagram and advantages.	**07**
Q.3	**(a)**	What is final control element? List the available Final control element and describe one of them with neat sketch.	**07**
	(b)	Why Optical pyrometer is required to measure Temperature? Draw and describe it construction, limitation and working.	**07**
		OR	
Q.3	**(a)**	Classify level measurement technique. Explain with neat sketch air bubbler method for water level measurement.	**07**
	(b)	What are the benefits we get if we use radiation type level measurement over convention type technique? Draw and describe radiation gauge for solid level measurement.	**07**
Q.4	**(a)**	Distinguish absolute pressure and gauge pressure measurement? Describe Inclined manometers with construction, head equation and its benefits.	**07**
	(b)	(i) What are the units of vacuum? List it. (ii) Draw and describe LVDT	**07**
		OR	
Q.4	**(a)**	(i) Why flow measurement is prime in Optimization and control? Justify it. (ii) List the different flowmeter. Draw and Describe Variable rotameter with neat sketch, working and limitation.	**07**
	(b)	Explain the working of density meter with it construction and limitation	**07**
Q.5	**(a)**	Describe one of the method for torque measurement with diagram, working and performance evolution.	**07**
	(b)	Draw and describe Laser based thickness measurement technique.	**07**
		OR	
Q.5	**(a)**	Draw and describe pH scale. Distinguish pH Measurement using Reference-measuring electrodes versus combined glass electrodes.	**07**
	(b)	Explain one of the viscosity measurement technique with its limitation and benefits.	**07**

****