Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER 2013

Subject Code: 151702 **Date: 21-05-2013**

Subject Name: Sensors and Signal Conditioning

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)**	Draw functional block diagram of Measurement System and describe each component in detail.	**07**
	(b)	Define following: (1) Accuracy and Precision (2) Resolution (3) Fidelity (4) Saturation (5) Calibration (6) Dead zone (7) Bandwidth.	**07**
Q.2	**(a)**	What are the applications of signals in control system? Give proper justification to each signal.	**07**
	(b)	List the method to measure basic electrical parameter. Describe any two with its construction, working, benefits and limitation.	**07**
		OR	
	(b)	Discuss the basics of an amplifier? Draw and describe measurement circuit of Differential amplifier. Compare it with instrumentation Amplifier	**07**
Q.3	**(a)**	Why LVDT is called linear transducer? Draw and describe construction, working, benefits and limitation of LVDT.	**07**
	(b)	Explain the vibration type transducer with necessary details	**07**
		OR	
Q.3	**(a)**	What is the role of passive transducer in electrical measurement system? Describe Resistive type temperature measuring sensors with suitable circuit.	**07**
	(b)	List the passive inductive transducer. Explain eddy current type displacement transducer with application.	**07**
Q.4	**(a)**	Compare the accuracy and stability of capacitive transducer with resistive one. Describe capacitive moisture transducer including its design, working and its limitation.	**07**
	(b)	Why charge amplifier is required in piezo- transducer? Explain it for Piezo-electric pressure measuring device.	**07**
		OR	
Q.4	**(a)**	What is the importance of tachometers in control system? Explain reluctance type tachometer with its construction, working, benefits and limitation.	**07**
	(b)	Explain Photo electric effect. Compare performance and application of Photo-voltaic, Photo-emissive and Photo-conductive transducer.	**07**
Q.5	**(a)**	Compare performance of crystal oscillator with LC-tuned oscillator. Explain any one in detail.	**07**
	(b)	What are the requirements of high frequency oscillator? Explain Op-Amp based amplifier with its gain and working frequency.	**07**
		OR	
Q.5	**(a)**	Why regulation is require for voltage type electrical parameter? Draw and describe three terminal variable voltage regulators.	**07**
	(b)	List the radiation range of nuclear gauge. Describe its construction, working, benefits and limitation.	**07**

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