Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– V • EXAMINATION – WINTER 2016

Subject Code: 151702 Date: 19/11/2016
Subject Name: Sensors and Signal Conditioning
Time: 10:30AM – 01:00PM 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 following terms: 1) Precision 2) Span 3) Laplace transform 4) Periodic signal 5) Gross error 6) Pulse modulation 7) Reproducibility	7
	(b)	Draw functional block diagram of Measurement System and describe each component in detail.	7
Q.2	(a)	Describe construction, working, benefits and limitation of LVDT.	7
	(b)	What do you mean by electrochemical transducer? Explain measurement of pH using glass and reference electrode.	7
		OR	
	(b)	Explain digital tachometer in detail.	7
Q.3	(a)	Explain first order low pass butterworth active filter with necessary circuit diagram, frequency response and equation for gain and phase.	7
	(b)	Explain piezoelectric transducer in detail.	7
		OR	
Q.3	(a)	What is the need of voltage regulation? Draw and describe three terminal variable voltage regulators.	7
	(b)	Explain crystal oscillator with neat sketch.	7
Q.4	(a)	Discuss the role of capacitive transducers to measure thickness of insulating sheer in motion, without making physical contact. Also comment on the sensitivity and linearity of the system.	7
	(b)	Explain the construction of resistive strain gauge with its basic principle. Also discuss its application for the measurement of force and flow.	7
		OR	
Q.4	(a)	Describe the construction and operation of a thermal conductivity gauge.	7

	(b)	Explain the operation of multiplexing and demultiplexing and indicate their application.	7
Q.5	(a)	Write a short note on Data logger.	7
	(b)	Explain the function of CRT with neat diagram.	7
		OR	
Q.5	(a)	Explain the Schmitt Trigger circuit with necessary diagram and waveforms.	7
	(b)	Explain the basic mechanism of recording and reproduction of an analog voltage signal by using a magnetic tape.	7

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