

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 151702

Date: 01/05/2017

Subject Name: Sensors and Signal Conditioning

Time: 02:30 PM to 05:00 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) State and define different static characteristics of the measurement system. 07
(b) Describe various test signals with its waveforms and representation. 07

- Q.2 (a) Explain the construction of resistive strain gauge with its basic principle. 07
Discuss any one application of resistive strain gauge.
(b) Describe the construction and operation of a thermal conductivity gauge and 07
show that it can be used for analysis of binary gas mixture.

OR

- (b) Explain Capacitive level transducer for use in insulating and conducting 07
liquids and for use in conducting liquid only. Give its equivalent capacitance
Circuit.
Q.3 (a) Describe the construction features of magnetostrictive transducer and obtain 07
input and output relationship with application.
(b) What are the piezoelectric materials? Discuss the piezoelectric strain 07
transducers.

OR

- Q.3 (a) What is pH? Explain different types of pH electrodes in detail. 07
(b) Discuss the Movable core type inductive transducers with necessary sketches. 07

- Q.4 (a) Explain the working of crystal oscillator with neat diagram. 07
(b) Explain Sampling system with components and sampling circuit. Discuss the 07
various sampling circuit performance parameters.

OR

- Q.4 (a) With a neat circuit and suitable waveforms, explain the working of window 07
comparator.
(b) Discuss the function of ZCD (Zero Crossing Detector) and Schmitt trigger 07
with neat circuit diagram and input-output waveform.

- Q.5 (a) Write a detailed note on types of AC voltmeter and explain RMS responding 07
AC voltmeter with necessary block diagram.

- (b) Explain the basic mechanism of recording and reproduction of an analog voltage signal by means of a magnetic tape recorder. 07

OR

- Q.5 (a) Explain the operation of multiplexing and de-multiplexing and indicate their Application. 07
- (b) What are data acquisition systems? What is their role in the field of Instrumentation, explain it with necessary block diagram. 07