

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