

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V (OLD) - EXAMINATION – SUMMER 2018

Subject Code:151702

Date:30/04/2018

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) Explain the operations of ‘multiplexing’ and ‘demultiplexing’ and indicate their application in instrumentation. **07**
- (b) Explain active electric filter. Explain one of each with draw necessary circuit diagram and calculation. **07**
- Q.2** (a) Explain eddy current type inductive transducer in detail. **07**
- (b) Explain reference electrode for PH measurement with neat sketch. **07**
- OR**
- (b) Explain digital tachometer in detail **07**
- Q.3** (a) Explain in detail the Magnetostrictive phenomenon and magnetosrictive force transducer. **07**
- (b) Define following: (1) Accuracy and Precision (2) Resolution (3) Fidelity (4) Saturation (5) Calibration (6) Dead zone (7) Bandwidth. **07**
- OR**
- Q.3** (a) What are data acquisition systems and what is their role in the field of instrumentation with necessary block diagram **07**
- (b) What is meant by cold junction compensation and how is it effected in industrial environment **07**
- Q.4** (a) Draw a circuit of a Schmitt trigger and suggest its applications. **07**
- (b) Explain the techniques of obtaining direct and indirect Frequency modulation. **07**
- OR**
- Q.4** (a) Explain Hall effect and suggest it application **07**
- (b) Show how capacitive transducers can be used to monitor the thickness of insulating sheer in motion, without making physical contact and discuss on the sensitivity and linearity of the system **07**
- Q.5** (a) Explain Briefly the techniques adopted for measurement of time interval, showing how it is indicated **07**
- (b) Discuss the basic principle of hot wire resistance sensor. Explain hot wire Anemometry and its role in the measurement of gas flow rates in closed pipes. **07**
- OR**
- Q.5** (a) Discuss the role of op-amp as a comparator. Also discuss the function of ZCD (Zero Crossing Detector) and Schmitt trigger with neat circuit diagram and input-output waveform. **07**
- (b) Discuss the role of data logger. Describe different stages of data logger with its internal block diagram. **07**
