

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– III (New) EXAMINATION – WINTER 2019****Subject Code: 3134103****Date: 28/11/2019****Subject Name: Sensor and Instrumentation****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.

| | | Marks |
|------------|---|-----------|
| Q.1 | (a) Differentiate between sensor and transducers. | 03 |
| | (b) Define following term: 1) Sensitivity 2) Hysteresis 3) Precision 4) Accuracy | 04 |
| | (c) Explain the principle of operations of LVDT with the help of neat sketch and characteristics. | 07 |
| Q.2 | (a) Define following terms: 1) Gauge Factor 2) CMRR 3) Span | 03 |
| | (b) Explain the function block of the measurement system with neat diagram. | 04 |
| | (c) Describe the RTD and explain, how it can be used to measure temperature. | 07 |
| OR | | |
| | (c) Discuss about the construction of thermistor and its resistance temperature characteristics. | 07 |
| Q.3 | (a) What is smart sensor. Mention application of smart sensor. | 03 |
| | (b) Explain Piezo resistive effect. | 04 |
| | (c) What is Amplifier ? Describe the ideal characteristics of operational amplifier | 07 |
| OR | | |
| Q.3 | (a) Define noise. write the classification of noise. | 03 |
| | (b) Explain seeback and Peltier effects | 04 |
| | (c) Explain voltage follower . | 07 |
| Q.4 | (a) Write application of tactile sensor. | 03 |
| | (b) Explain the strain gauge. | 04 |
| | (c) Explain heat transfer using thermal conduction. | 07 |
| OR | | |
| Q.4 | (a) Define gyroscope. Write working principle of gyroscope. | 03 |
| | (b) Explain Square wave Oscillator. | 04 |
| | (c) Explain Zener diode with circuit Diagram and Draw the voltage – current characteristics. | 07 |
| Q.5 | (a) Describe about DAQ? What is the need for DAQ? | 03 |
| | (b) Explain two wire Data Transmission. | 04 |
| | (c) Explain how the fiber optic sensor work and list out its advantages. | 07 |
| OR | | |
| Q.5 | (a) What is the purpose of the sample and hold circuit? | 03 |
| | (b) Explain null balance bridge circuit . | 04 |
| | (c) Explain successive – Approximation type A-D converter. | 07 |
