

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-III EXAMINATION – WINTER 2025

Subject Code:3134103

Date:12-12-2025

Subject Name: Sensor and Instrumentation

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

Marks

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|------------|---|-----------|
| Q.1 | (a) Give sensor classification | 03 |
| | (b) Define following term:
1) Sensitivity 2) Hysteresis 3) Precision 4) Accuracy | 04 |
| | (c) Define Insulating material. Also explain its type with temperature stability. | 07 |
| Q.2 | (a) Explain calibration technique | 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) Explain the principle of operations of LVDT with the help of neat sketch and characteristics. | 07 |
| Q.3 | (a) What is smart sensor? Mention application of smart sensor. | 03 |
| | (b) Explain piezoelectric effect. | 04 |
| | (c) Give principle operation, Construction and working of capacitive sensor. Also give advantages plate capacitor. | 07 |
| | OR | |
| Q.3 | (a) Explain GPS (Global Positioning System.) Also give advantages. | 03 |
| | (b) Explain seeback and Peltier effects. | 04 |
| | (c) Explain voltage follower. | 07 |
| Q.4 | (a) Define: Amplifiers. | 03 |
| | (b) Give characteristics of Interface electronics circuits. | 04 |
| | (c) Explain heat transfer using thermal conduction. | 07 |
| | OR | |
| Q.4 | (a) Explain RTD with advantages. | 03 |
| | (b) Explain uses of data acquisition system. | 04 |
| | (c) Explain Zener diode with circuit Diagram and Draw the voltage – current characteristics. | 07 |
| Q.5 | (a) Give principle and construction of Load cell. | 03 |
| | (b) Explain Ultrasonic sensor with its applications. | 04 |
| | (c) Explain Direct Digitization and processing. | 07 |
| | OR | |
| Q.5 | (a) Describe about DAQ? What is the need for DAQ? | 03 |
| | (b) Explain Bluetooth sensor. | 04 |
| | (c) Explain how the fiber optic sensor work and list out its advantages. | 07 |
