Enrolment No./Seat No_____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE- SEMESTER–VI EXAMINATION – WINTER 2025**

**Subject Code:3161008 Date:21-11-2025**

**Subject Name:Sensors and Transducers**

**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.**
4. **Simple and non-programmable scientific calculators are allowed.**

| | | | MARKS |
|---|---|---|---|
| **Q.1** | **(a)** | Define (1) Drift (2) Precision (3) Accuracy. | **03** |
| | **(b)** | Define (1) Measuring Lag (2) Fidelity (3) Dynamic Error (4) Speed of Response. | **04** |
| | **(c)** | Any two temperature sensors, any two pressure sensors, and any two light sensors can be listed. Explain any one of these six sensors in detail. | **07** |
| **Q.2** | **(a)** | How a thermistor differs from a thermocouple as a temperature sensor. | **03** |
| | **(b)** | Differentiate characteristics of RTD and Thermistor. | **04** |
| | **(c)** | Summarize the construction, principle, and working of a thermistor and its resistance temperature characteristic. | **07** |
| | | **OR** | |
| | **(c)** | Describe with neat diagram and output characteristics the principle of LVDT construction and operation. | **07** |
| **Q.3** | **(a)** | List out various types of Strain Gauges. | **03** |
| | **(b)** | Compare Capacitive and Inductive transducers. | **04** |
| | **(c)** | What is meant by LIDAR? Explain its various components, functionalities, and applications. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Define Hall- effect and justify its applications of it. | **03** |
| | **(b)** | Explain Tactile Sensor. | **04** |
| | **(c)** | Discuss the operation of a Strain Guage and evaluate its applications as a force sensor. | **07** |
| **Q.4** | **(a)** | State advantages of fiber Optic sensors and write its applications. | **03** |
| | **(b)** | Define Dark Resistance and list out some materials used for the construction of LDR. | **04** |
| | **(c)** | Explain the working of Hay's bridge with suitable phasor diagram. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Explain Photo Conductive Cell in brief. | **03** |
| | **(b)** | Explain Power Factor meter. | **04** |
| | **(c)** | Explain the working of kelvin's double bridge for measurement of low resistance with a neat diagram. | **07** |
| **Q.5** | **(a)** | List out any two applications which need MEMS sensors. | **03** |
| | **(b)** | Draw and explain Sample and Hold Circuit. | **04** |
| | **(c)** | Explain any one type of ADC with a neat diagram. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Define GPS and list the applications. | **03** |
| | **(b)** | What is signal conditioning and why is it required. | **04** |
| | **(c)** | Explain any one type of DAC with a neat diagram. | **07** |

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