Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VI • EXAMINATION – SUMMER 2013**

**Subject Code: 162401** **Date: 24-05-2013**

**Subject Name: Industrial Instrumentation**

**Time: 10.30 am - 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.**

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|---|---|---|---|
| **Q.1** | **(a)** | Define the following terms: 1. Precision 2. Resolution 3. MDS 4. Threshold 5. Hysteresis 6. Sensitivity 7. Accuracy | **07** |
| | **(b)** | Define Sensor. List the different criteria for classifies the sensors. Explain in each in brief. | **07** |
| **Q.2** | **(a)** | List the parameters in electrical characterization of sensor. Explain each one in detail with necessary diagram. | **07** |
| | **(b)** | Define LVDT. Explain the construction & operation of LVDT using equivalent circuit of LVDT. | **07** |
| | | OR | |
| | **(b)** | How is óbath tubô curve associated with failure of transducers? What are the screening steps taken in standard silicon integrated wafers? | **07** |
| **Q.3** | **(a)** | Compare the following terms:<br>1. Unbounded and Bounded Strain Gauge<br>2. J and K type Thermocouple. | **08** |
| | **(b)** | Explain the working of Electromagnetic flow meter with necessary diagram. | **06** |
| | | OR | |
| **Q.3** | **(a)** | Compare the following terms:<br>1. PZT and PLZT<br>2. Primary and Secondary Temperature sensors. | **08** |
| | **(b)** | Draw structure of Photovoltaic Cell and Explain its working. | **06** |
| **Q.4** | **(a)** | What is synchro-resolver? Explain the operation of Synchro-resolver for measuring angular rotation. Append diagram as needed. | **07** |
| | **(b)** | What is an Opto-coupler? Describe different types of Opto-coupler and Explain its operating principle along with its application. | **07** |
| | | OR | |
| **Q.4** | **(a)** | What are the different types of magnetic sensors? On what principle do they work? Outline briefly. | **07** |
| **Q.4** | **(b)** | What is basically the concept of óSmart Sensorô? Explain with the help of a diagram the arrangement of its elements. | **07** |
| **Q.5** | **(a)** | Write technical note describing construction, characteristics and application on Geiger Counter. | **07** |
| | **(b)** | Write technical note describing construction, characteristics and application on SHE. | **07** |
| **Q.5** | **(a)** | Write technical note describing construction, characteristics and application on PH sensors. | **07** |
| | **(b)** | Write technical note describing construction, characteristics and application on Nano Sensors. | **07** |

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