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.**

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: **08**

1. Unbounded and Bounded Strain Gauge
2. J and K type Thermocouple.

(b) Explain the working of Electromagnetic flow meter with necessary diagram. **06**

OR

Q.3 **(a)** Compare the following terms: **08**

1. PZT and PLZT
2. Primary and Secondary Temperature sensors.

(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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