Seat No.:	Enrolment No.

Subject Code: 162401

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI • EXAMINATION - SUMMER • 2014

Date: 19-05-2014

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. 07 (a) Define following. 0.1 1. Resolution 2. Precision 3. Accuracy 4. Threshold 5. Linearity 6. Hysteresis 7. Repeatability (b) Explain the construction, working and characteristics of LVDT. List the **07** advantages of LVDT. **Q.2** Explain the theory of operation of resistance strain gauge and derive the equation **07** for the gauge factor. Draw the flat grid type strain gauge. (b) Explain the piezoelectric sensors with necessary diagram. List the materials used 07 for piezoelectric sensors. List the properties of natural quartz. OR Explain the electrical characterization of the sensors. 07 **(b) Q.3** Explain the construction and working of platinum resistance thermometer. 07 (a) Explain the hall effect principle with neat diagram. Explain the hall effect angular **07** displacement transducer. OR Explain the Seebeck effect. List the factors affecting the choice of materials for **07 Q.3** thermoemf sensors. Explain the construction of the thermocouple. Explain the construction and working of ultrasonic flow meter. **07 (b) Q.4** (a) Explain the construction and working of electromagnetic flow meter. 07 photoconductivity. **Explain** the construction and 07 working photoconductive cell. OR Explain in brief the temperature measurement and liquid level detector using **Q.4 07** (a) optical fibre. **(b)** Write a technical note on "Standard Hydrogen Electrode". **07 Q.5** 07 (a) Explain the pH measurement in detail. List the properties of intelligent field device. Draw the block diagram of the **07 (b)** typical intelligent sensor and explain in brief. OR Write a technical note on "ChemFET". 07 Q.5 (a) **(b)** Explain the data communication in smart transmitters. **07** ******