Seat No.:	Enrolment No.

Subject Code:X70903

GUJARAT TECHNOLOGICAL UNIVERSITY PDDC SEMESTER VII– EXAMINATION – SUMMER 2017

Date: 03/05/2017

Subject Name: Industrial Instrumentation Time: 02.30PM to 05.00PM **Total Marks: 70 Instructions:** 1. Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. (a) What are transducers? Explain advantages of electrical transducers and give the 07 0.1 classification of transducer. **(b)** What is Piezoresistive effect? Define gauge factor. Derive an expression of gauge 07 factor for Strain gauge in terms of Poisson's ratio. What is Piezoelectric transducer? Give its equivalent circuit. Derive an expression for 07 **Q.2** the output voltage by making suitable simplifying assumptions. **(b)** Differentiate between following 07 (a) Active and Passive transducers (b) Primary and Secondary transducer OR(b) Why temperature compensation in strain gauge circuit is required? Explain any 07 one method in detail. Explain working principle and use of Capacitive type transducer for displacement. 07 0.3 What is Piezoelectric transducer? Give its equivalent circuit. Derive an expression for 07 the output voltage by making suitable simplifying assumptions. OR Explain the construction and working principle of LVDT. Also explain performance 0.3 07 characteristic of it. **(b)** Hall effect transducer: Principle and its applications. 07 0.4 (a) Explain construction and working principle of RTD. Also explain factors to be 07 considered during the selection of materials for RTD. (b) Explain how rotameter can measure the liquid flow? Also state its advantages and **07** disadvantages. OR Explain the construction and working of Thermocouple. Describe the various types of **Q.4** 07 (a) compensations employed. **(b)** Explain working of Ultrasonic flow meter. 07 Q.5 (a) Explain how Pirani pressure gauge measures the vacuum pressure. 07 **(b)** Explain construction and working of X-Y recorder Also state its applications. 07 OR (a) Explain McLeod Gauge for pressure measurement with necessary. **Q.5** 07 **(b)** State different methods for torque measurement. Explain any one in detail. **07**
