

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (OLD) - EXAMINATION – SUMMER 2017****Subject Code: 170904****Date: 06/05/2017****Subject Name: Industrial Instrumentation****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.

- Q.1** (a) What is Transducer? Explain factors influencing the choice of transducers. **07**  
 (b) State and explain desirable and undesirable characteristics of transducer. **07**
- Q.2** (a) Classify the different types of Strain gauges. Explain Semiconductor strain gauge in detail. Also state its advantages. **07**  
 (b) State different strain gauge circuits use for Strain measurement. Explain any one in detail. Also derive equation for output voltage. **07**
- OR**
- (b) State different temperature compensation techniques used with strain gauge. Explain any one in detailed. **07**
- Q.3** (a) Explain construction and working of Thermistor. Also state its advantages, disadvantages and applications. **07**  
 (b) State different type of Load cell used for force measurement. Explain any one in detail. **07**
- OR**
- Q.3** (a) Explain construction and working principle of Thermocouple. Also explain Cold junction compensation. **07**  
 (b) What is Magnetostiction effect? Explain how it is used for torque measurement. **07**
- Q.4** (a) Define (a) Differential Pressure (b) Static pressure **07**  
 Explain construction and working of Pirani gauge.  
 (b) Describe with neat sketch the construction and working of Rotameter. State it' Advantages and Disadvantages. **07**
- OR**
- Q.4** (a) Define (a) Gauge Pressure (b) Absolute pressure **07**  
 Explain construction and working of McLeod gauge.  
 (b) State different methods used for Flow measurement. Explain how Venturi tube used for flow measurement Also state its advantages and disadvantages. **07**
- Q.5** (a) Explain Ultrasonic level detection method. **07**  
 (b) Explain the construction and working of Piezoelectric transducer. Also derive output equation **07**
- OR**
- Q.5** (a) Explain capacitive voltage divider method for measurement of level of high conductivity liquid. **07**  
 (b) Explain how inductive transducer used for Linear measurement and Capacitive transducer used for angular displacement. **07**

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