

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-7 • EXAMINATION – SUMMER 2018

Subject Code: 170904**Date: 05-05-2018****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) Define Transducers. Discuss need of Transducers in process control industry. **07**
Mention at least five technical advantages of Electrical Transducers.
- (b) Draw block diagram of Instrumentation System. Explain every block. **07**
- Q.2** (a) Give classification of Strain Gauge with reference to principle of operation and constructional features. A Strain Gauge with gauge factor of 4 has a resistance of 120 Ω when unstrained. If the strain gauge undergoes a change in length from 0.25 mm to 0.255 mm, find the new resistance. **07**
- (b) Why temperature compensation is required in strain gauge? Explain temperature compensation through bridge arrangement. **07**
- OR**
- (b) Mention at least four applications of Hall effect Sensors and Proximity Sensors. **07**
- Q.3** (a) Explain principle of Capacitive Sensors for measurement of displacement. **07**
- (b) Write a short technical note on Synchros and Resolvers. **07**
- OR**
- Q.3** (a) Which parameters decide Sensitivity of load cell? What are the limitations of Pirani Gauge? **07**
- (b) Explain construction and working of Piezoelectric pressure transducer. **07**
- Q.4** (a) Explain Seebeck effect and Thomson effect. Mention temperature range for Pyrometer, Thermocouple and Thermistors. **07**
- (b) Explain in detail filament type Optical Pyrometer for very high temperature measurement. **07**
- OR**
- Q.4** (a) Explain principle of Venturi Tube for Flow Measurement. Mention its advantages and disadvantages. **07**
- (b) Explain Inductive method of level measurement with diagram. **07**
- Q.5** (a) Write short technical note on X-Y Recorders. **07**
- (b) Write short technical note on Ultrasonic Flow Meter. **07**
- OR**
- Q.5** (a) What are the Objectives of Data Acquisition System? Differentiate Time-based system and Event-based system for acquiring raw data. **07**
- (b) Explain n-Channel Data Acquisition System with block diagram. **07**
