

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII • EXAMINATION – SUMMER • 2015

Subject code: 170904**Date: 04/05/2015****Subject Name: INDUSTRIAL INSTRUMENTATION****Time: 02.30pm-05.00pm****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? Discuss static and Dynamic characteristics of Transducers. **7**
(b) Differentiate between the following with suitable examples of each: **7**
(i) Active and Passive Transducer. (ii) Primary and Secondary Transducer
(iii) Analog and Digital Transducer
- Q.2** (a) Differentiate Unbonded and bonded type strain gauge. How is the temperature compensation carried out using strain gauge in a bridge circuit? **7**
(b) Discuss stroboscopic method of measuring rotational speed of a machine. **7**
- OR**
- (b) List different principles involved behind weight measurements and explain strain gauge load cell for weight measurement. **7**
- Q.3** (a) List different types of thermocouples used for temperature measurement. Explain thermoelectric laws and the method for cold junction compensation in thermocouple **7**
(b) Give the merits, demerits and applications of (i) Platinum resistance thermometer **7**
(ii) Thermistor (iii) Thermocouple for measurement of temperature.
- OR**
- Q.3** (a) Explain any one Electrical method for measurement of Humidity (Moisture) with it's merits and demerits. **7**
(b) Draw the schematic of X-Y recorder and describe it's working. **7**
- Q.4** (a) State and explain various principles of operation of Capacitive Transducers for level measurements. **7**
(b) Explain Optical Encoder Principle used for Shaft Speed Measurement. **7**
- OR**
- Q.4** (a) Explain Black Body concepts for very high temperature measurements. Describe with neat diagram how disappearing filament type optical pyrometer can measure very high temperature. Mention it's merit and demerits. **7**
(b) Describe basic difference between a variable area type flow meter and differential pressure type flow meter. With necessary formula describe how Rotameter is used to measure the flow of given liquid. **7**
- Q.5** (a) Describe with neat diagram how strain gauge is used for torque and pressure measurement **7**
(b) Describe the application of LVDT for pressure measurement. **7**
- OR**
- Q.5** (a) Write Short Notes on (i) Proving Ring Load cell (ii) Prony Brake **10**
(b) Describe in brief operation of sample and hold circuit. **4**
