

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 its merits and demerits. 7
- (b) Draw the schematic of X-Y recorder and describe its 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 its 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
