

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII(NEW) • EXAMINATION – WINTER 2016****Subject Code:2170913****Date:18/11/2016****Subject Name:Industrial Instrumentation(Departmental Elective - II)****Time:10.30 AM to 1.00 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 following term. **07**
 (i) Resolution (ii) Repeatability (iii) Accuracy (iv) Fidelity
 (v) Absolute pressure (vi) Mechanical hysteresis (vii) Static error
- (b) What is piezoelectric transducer? Draw its equivalent circuit and derive an expression for the output voltage. **07**
- Q.2** (a) Describe, with neat sketches, construction and working of RVDT with its characteristic, advantages and disadvantages. **07**
- (b) What is piezo resistive transducer? Define gauge factor. Derive an expression of the gauge factor for strain gauge in terms of Poisson's ratio. **07**
- OR**
- (b) A strain gauge with gauge factor of 4 has a resistance of 120 when unstrained. If the strain gauge undergoes a change in length from 0.25mm to 0.255mm, find the new resistance. **07**
- Q.3** (a) Enlist primary pressure sensing devices. Describe with neat sketch, measurement of pressure using LVDT. **07**
- (b) Explain proving ring type load cell. **07**
- OR**
- Q.3** (a) Describe torque measurement using proximity sensor. Also write advantages and disadvantages. **07**
- (b) Explain with neat sketch, how McLeod pressure gauge measure vacuum pressure? **07**
- Q.4** (a) Explain RTD with diagram, construction, principle, working, merits, demerits and application. **07**
- (b) What is pyrometer? Enlist the types of pyrometer. Explain any one in brief. **07**
- OR**
- Q.4** (a) Compare thermocouple, thermistor and RTD. **07**
- (b) Write a short note on: pirani gauge. **07**
- Q.5** (a) Describe air purge system for level measurement. **07**
- (b) Explain hot wire anemometer with neat sketch. **07**
- OR**
- Q.5** (a) Describe major elements of data acquisition system. **07**
- (b) Explain the need of recorders. Differentiate strip chart and X-Y recorder. **07**
