I – 155

Seat No.

T.E. (Electrical) (Semester – V) (New Course) Examination, 2010
INSTRUMENTATION TECHNIQUES

Day and Date : Wednesday, 1-12-2010 Total Marks : 100

Time : 10.00 a.m. to 1.00 p.m.

Instructions *: 1) Attempt* ***any three*** *questions from* ***each*** *Section.*

2) Draw neat sketch ***wherever*** *necessary.*

3) Figures to the ***right*** *indicate* ***full*** *marks.*

SECTION – I

1. a) Define and explain the following static performance parameters of an instrument :
   i) Accuracy ii) Precision iii) Resolution iv) Linearity. **8**

   b) Classify the transducer based on the principle of working. What are the factors which influence the selection of transducer ? **8**

2. a) Explain the necessity of signal conditioning and describe the working of any one type of modulator and demodulator. **8**

   b) From first principles, for a strain guage made of circular wire, derive expression for guage factor. **8**

3. a) Explain the working principle of following transducers : **8**
   i) Piezo-electric ii) L.V.D.T.

   b) With neat diagram, explain programmable gain amplifier. Also derive expression for gain. **8**

4. Explain in brief (**any three**) : **18**
   i) Data acquisition systems.
   ii) Voltage to frequency converter.
   iii) Type of filter.
   iv) Sample and Hold circuit.

P.T.O.

SECTION – II

5. a) Give types of PLC system and explain any one in detail. **8**

   b) List the various symbols used for input and output elements of PLC. **8**

6. a) With neat diagram, explain the working of Ramp digital voltmeter. **8**

   b) Draw the neat diagram of X-Y Recorder and explain the operation. **8**

7. a) Describe instrumentation setup for measurement of temperature using RTD. **8**

   b) Describe instrumentation setup for measurement of vibration. **8**

8. Explain in brief (**any three**) : **18**

   a) Digital input and output devices.

   b) Ladder diagram logic.

   c) Instrumentation setup for measurement of speed.

   d) Seven segment display.

   e) PLC selection and installation.