B.TECH. - ELECTRICAL ENGINEERING

Term-End Examination

December, 2012

BIEE-019 : ELECTRICAL INSTRUMENTATION

Time : 3 hours   *Maximum Marks : 70*

*Note : Attempt **any five** questions. All questions carry **equal** marks.*

1. (a) Explain the construction and principle of working of LVDT. Explain how the magnitude and direction of the displacement of core of an LVDT detected.   7

    (b) A platinum thermometer has a resistance of 100Ω at 25°C   7

    (i) Find its resistance at 65°C if the platinum has a resistance temperature co-efficient of 0.00392/°C.

    (ii) If the thermometer has a resistance of 150Ω calculate temperature.

2. (a) A piezo electric crystal having dimensions of $5mm \times 5mm \times 1.5mm$ and a voltage sensitivity of $0.055\ V - m/N$ is used for force measurement. Calculate force if voltage developed is 100 V.   7

(b) Explain different methods for measurement   7
of pressure.

3. (a) Describe the different methods of data   7
transmission. Explain the block diagram of
general telemetry system.

(b) Describe different types of channels used for   7
telemetry. Explain their advantages and
disadvantages.

4. (a) Draw block diagram of analog data   7
acquisition system. Describe its various
components.

(b) With neat block diagram explain the   7
working of modern digital data acquisition
system.

5. (a) Describe the basic components of a magnetic   7
tape recorder used for instrumentation
applications using direct recording
technique. Describe its advantages and
disadvantages.

(b) What is an X-Y recorder ? How do you   7
distinguish it from X-t and Y-t recorder ?
Explain with suitable diagram the working
of X-Y recorder.

6. (a) What are the basic elements of an industrial   7
        automatic controllers ? Explain process
        characteristics for PID control mode.

    (b) With neat diagram explain the working of   7
        fibre optic transducers.

7. Write short notes on **any three** of the following :

    (a) Microprocessor based instrumentation   5,5,4

    (b) Smart Sensors.

    (c) Digital oscilloscope.

    (d) Thermistors.

——————