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**BIEL-009**

01301

# B. Tech. ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

## Term-End Examination

## June, 2013

## BIEL-009 : ELECTRONIC MEASUREMENT AND INSTRUMENTATIONS

*Time : 3 hours* *Maximum Marks : 70*

*Note :* - *Answer **any seven** questions.*
- *Each question carries **equal** marks.*
- *Use of scientific calculator is **permitted**.*

1. What is the static characteristics of any measurement system ? What is the functional element of a generalized measurement system ? **10**

2. Explain Instrumentational error. A voltmeter having a sensitivity of 101000 Ω/V reads 100 V on its 150 V scale when connected across an unknown resistor in series with a milli-ammeter. When the milli-ammeter reads 5 mA, calculate : **10**

   (a) actual resistance of unknown resistor

   (b) error due to loading effect of voltmeter.

3. Explain the principle of AC voltmeter using rectifier type instruments. Discuss the rectifier elements and its characteristics. **10**

4. With neat diagram discuss the main functional elements of a general purpose oscilloscopes. **10**

5. Discuss the principle of measuring the phase and frequency using CRO. **10**

6. What is the Piezo resistive effect ? Prove that the gauge factor of a strain gauge is : **10**

$$G_f = \frac{\Delta R/R}{\Delta L/L} = 1 + 2\nu + \frac{\Delta e/\rho}{\epsilon}$$

Where $G_f \rightarrow$ gauge factor

$R \rightarrow$ Resistance of wire

$L \rightarrow$ Length of wire

$\nu \rightarrow$ Poission's ratio

$\rho \rightarrow$ resistivity of wire

$\epsilon \rightarrow$ Strain.

7. Explain the working principle and construction of LVDT. **10**

8. Explain the method for measuring pressure using Electrical Transducers as Secondary Transducer. **10**

9. What is a Spectrum Analyser ? Explain it with the aid of basic block diagram. **10**

10. Explain ***any two*** of the following : **2x5=10**

    (a) Gaussian Error distribution

    (b) Capacitive Transducer

    (c) Thermistor.