

**B.Tech. – VIEP – ELECTRICAL ENGINEERING
(BTELVI)**

Term-End Examination

December, 2015

**BIEE-007 : ELECTRICAL MEASUREMENTS AND
MEASURING INSTRUMENTS**

Time : 3 hours

Maximum Marks : 70

Note : Attempt any seven questions. All questions carry equal marks.

1. (a) Distinguish between the Direct and Indirect methods of measurement. Cite examples to support your answer.
- (b) Define the terms :
- (i) Repeatability
 - (ii) Accuracy
 - (iii) Precision
 - (iv) Resolution
 - (v) Linearity 2×5=10
2. (a) Define Limiting (Guarantee) errors, and also derive the expression for relative limiting error.

- (b) Discuss the different types of errors with suitable examples and explain the measures taken to minimize the following errors :
- (i) Instrumental Errors
 - (ii) Environmental Errors
 - (iii) Observational Errors $2 \times 5 = 10$
3. (a) Define and explain the working principle of a current transformer.
- (b) Explain the Absolute Null method for testing of a potential transformer. $2 \times 5 = 10$
4. (a) Describe the working of a Carey-Foster slide-wire bridge.
- (b) List the various methods used for the measurement of low resistance. Explain any one method with the help of a neat diagram. $2 \times 5 = 10$
5. Derive the general equation for balance for an AC bridge. Also prove that two conditions i.e. for magnitude and phase have to be satisfied. 10

6. (a) Define the following photometric terms :
- (i) Lumen
 - (ii) Luminous Intensity
 - (iii) Illuminance
 - (iv) Luminance
 - (v) Luminous Excitance
- (b) Describe the construction and working of a two element induction type energy meter. *2×5=10*
7. (a) Draw and explain the working principle of co-ordinate type AC potentiometer.
- (b) Calculate the inductance of a coil from the following measurement on an AC potentiometer, voltage drop across a 0.1Ω standard resistor connected in series with the coil = $0.613 / 12^\circ 6'$, voltage across the test coil through a 100/1 volt ratio box = $0.781 / 50^\circ 48'$ volt, frequency = 50 hz. *2×5=10*
8. Explain the working of electro-resonance type power factor meter. Draw the phasor diagram under different power factor conditions. *10*
9. Explain the Digital Voltmeter (DVM). Classify the various types and explain the Ramp type digital voltmeter, with the help of a neat diagram. *10*
10. Describe the working of strip-chart recorder. What are the different types of tracing systems used in it ? Explain with the help of a suitable diagram. *10*