

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

Term-End Examination

December, 2017

00762

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

Time : 3 hours

Maximum Marks : 70

*Note : Attempt any **seven** questions. All questions carry equal marks. Use of scientific calculator is allowed.*

1. Describe the various dynamic characteristics of measurement and instruments. Derive an expression for the response of a first order system to a unit step input. 10

2. (a) Discuss the construction and working of a galvanometer. 5

- (b) A moving coil consists of 100 turns wound around a rectangular former of length 3 cm and width 2 cm and flux density in the air gap is 0.06 Wb/m^2 . Calculate the torque acting on the coil when carrying a current of 0.005 A. 5

3. (a) Explain the working principle of Current Transformer (CT) and its advantages over a conventional transformer. 5
- (b) Why should the CT secondary not be kept open ? Explain in detail. 5
4. (a) Discuss the construction and working principle of a dynamometer type wattmeter. 6
- (b) What special features are incorporated in a dynamometer type wattmeter to make it a low power factor type wattmeter ? 4
5. Derive the balance equations and explain the theory for measurement of unknown inductance and resistance by Anderson's Bridge theory. Draw a phasor diagram at balance. 10
6. Explain the construction and working of a coordinate type AC potentiometer. Also describe the process of standardization of this potentiometer. 10
7. (a) Describe the construction and working of a dual beam CRO with the help of its functional block diagram. 5
- (b) Calculate the maximum velocity of the beam electrons in a CRT having a cathode anode voltage of 800 V. Assume that the electrons leave the cathode with zero velocity. Charge of electron = 1.6×10^{-19} C and mass of electron = 9.1×10^{-31} kg. 5

8. (a) State and explain the different laws of Illumination. 5
- (b) Define Luminous Efficiency. What are the different levels of illumination? 5
9. Write short notes on any *two* of the following: $2 \times 5 = 10$
- (a) Flux Meter
- (b) Measurement of Low Resistance
- (c) Electronic Energy Meter
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