

3E1485

Roll No. _____

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3E1485**B.Tech. III Semester (Back) Examination Dec. - 2016****Electrical Engg.****3EE5(O) Electrical Measurements****Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 26****Instructions to Candidates:**

Attempt any **five** questions, selecting one question from **each unit**. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit - I

1. a) Explain the construction and working principle of moving iron instruments in detail. (8)
- b) Explain the working principle of $1-\phi$ energy meter. (8)

OR

1. a) Explain the construction and working principle of moving coil instruments. (8)
- b) Explain errors in wattmeter and energy meter and how they are corrected? (8)

Unit - II

2. a) State and derive the Blondel's Theorem. (8)
- b) Draw the equivalent circuit and phasor diagram of a potential transformer. Derive the expressions for its ratio and phase angle errors. (8)

OR

2. a) Describe the two wattmeter method of measurement of power in 3-phase circuit. (8)
- b) Explain with neat diagram, how PT and CT are useful for measurement of power. (8)

Unit - III

3. a) What is volt - ratio box? Explain how volt ratio box works? (8)
b) What is calibrated using a D.C. potentiometer? Explain with suitable circuit diagram. (8)

OR

3. a) Explain in detail the construction and working principle of A.C. potentiometer. (8)
b) Explain crompton potentiometer in detail. (8)

Unit - IV

4. a) Explain the principle of working of a kelvin's double bridge for low resistance measurement. (8)
b) Explain Price's Guard - wire method for measurement at high resistance. (8)

OR

4. Describe the following methods for measurement of medium resistance :
i. Ammeter and voltmeter method.
ii. Wheatstone bridge method. rtuonline.com (8+8=16)

Unit - V

5. a) Explain with the connection and phasor diagram of Hay's bridge for measurement of inductance. (8)
b) Draw Wien's bridge and its phasor diagram for measurement of capacitance and frequency. Also obtain expression for frequency in terms of bridge parameters. (8)

OR

5. a) Discuss with phasor diagram the Heaviside's bridge for measurement of mutual inductance. (8)
b) What are the sources of errors in bridge circuits? What are the precautions and methods used to minimize the errors? (8)