

3E1485

Roll No. : _____

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B.Tech. (Sem. III) (Main/Back) Examination, January - 2012
Electrical Engg.
3EE5 Electrical Measurements

Time : **3 Hours**][Total Marks : **80**[Min. Passing Marks : **24****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.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. _____ Nil _____ 2. _____ Nil _____

UNIT - I

- 1 (a) Derive the general torque equation for a moving iron instrument. The inductance of a moving iron instrument is given by : $L = (10 + 5\theta - \theta^2) \mu H$

8

where θ is the deflection in radian from zero position the spring constant is 12×10^{-6} Nm/rad. Estimate the deflection for a current of 5A.

- (b) Explain the construction and working principle of moving coil instruments.

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OR

- 1 (a) Explain the classification of Moving Iron instruments.

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- (b) Explain the working principle of 1- ϕ energy meter.

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UNIT - II

- 2 (a) State and derive the Blondel's theorem.

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[Contd...

- (b) Describe the two wattmeter method of measurement of power in 3-phase circuit. 8

OR

- 2 (a) Draw the equivalent circuit and phasor diagram of a potential transformer. Derive the expressions for its ratio and phase angle errors. 8
- (b) Why the secondary of a C.T. should never be open circuited? 8

UNIT - III

- 3 (a) Explain in detail the construction and working principle of A.C. potentiometer. 8
- (b) Explain the wattmeter calibration using a D.C. potentiometer. 8

OR

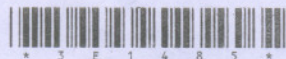
- 3 (a) Write short note on potentiometer standardization. 8
- (b) What is calibration using a d.c. potentiometer? Explain with suitable circuit diagram. 8

UNIT - IV

- 4 (a) Explain the principle of working of a Kelvin's Double Bridge for low resistance measurement. 8
- (b) Describe loss of charge method for determining the high resistance, prove the formula used. 8

OR

- 4 (a) Describe the fall of potential method for measurement of earth resistance. 8
- (b) Explain Price-Guard's wire method for measurement at high resistance. 8



UNIT - V

5 (a) Explain the Schering's bridge. Where is it used ? Derive its equation of balance. 8

(b) Write short note on Wagner earth device. 8

OR

5 (a) Explain in detail the working principle of Anderson's bridge. 8

(b) Explain the working and construction of De Sauty bridge for capacitance measurement. 8

