C 58185 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION JUNE 2009

EE 04 403—ELECTRICAL MEASUREMENTS AND MEASURING INSTRUMENTS

(2004 Admissions)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

1. (a) What are the different methods of obtaining the controlling torque in an indicating instrument ?

   (b) Draw the equivalent circuit and phasor diagram of a current transformer.

   (c) Explain (i) creeping (ii) overload compensation in a 1 phase induction type energymeter.

   (d) What is phantom loading ? State the advantages.

   (e) What is the importance of the value of Earth's resistance ? What are factors which influence its value ?

   (f) What are the modifications and additional features incorporated in a low voltage Schering bridge for it to be used on high voltages ?

   (g) Describe briefly the different types of tests that are used for testing of magnetic materials.

   (h) What are permeameters ?

($8 \times 5 = 40$ marks)

Part B

II. (a) With the help of neat diagram, describe the construction and working of a moving Iron attraction type meter. Also derive its torque equation.

Or

(b) Draw the equivalent circuit and phasor diagram of a potential transformer. Derive the expressions for its ratio and phase angle errors. Describe the assumptions made for derivation of errors.

(15 marks)

III. (a) Describe in detail the working and construction of Trivector meter.

Or

(b) Explain the working of electro resonance type power factor meters. Draw the phasor diagram under different power factor conditions.

(15 marks)

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Turn over

IV. (a) Describe with a diagram of connections the loss of charge method of determining the insulation resistance of a length of cable. Prove the formula used for this determination.

Or

(b) Describe a suitable a.c. bridge method for measuring, at a frequency of 500 cycles per second, the self inductance and effective resistance of a coil of approximately 0.2. Henry inductance and 5 ohm resistance. Draw the phasor diagram for the balance conditions and give the equations for balance.

(15 marks)

V. (a) Describe a method of using an a.c. potentiometer for measuring the loss in an iron ring made up of thin stampings. Explain how the loss may be calculated in terms of the maximum density and state any assumptions made.

Or

(b) Describe the LLoyd Fisher square for measurement of iron losses in a specimen of lamination. Describe how corrections for resistance of Wattmeter pressure coil and resistance of secondary windings are applied.

(15 marks)

[4 × 15 = 60 marks]