

Lib
28/04/09

Electrical Measurement & Measuring Instruments

- N.B. : (1) Question No.1 is compulsory.
 (2) Attempt any four questions out of remaining questions.
 (3) Figures to the right indicate full marks.

1. Solve any four :- *S: ETE) III Rev Elect. Measurement & measuring instrument - 20*

- (a) Define limiting error. Derive an expression for relative limiting error. *20*
 - (b) Compare spring and gravity control methods of producing the deflecting torque. *Page 10*
 - (c) Define the following terms related to the instrument transformer :-
 - (i) Ratio error
 - (ii) Phase angle error.
 - (d) Justify "Hay's bridge is suitable for measuring inductance of high Q. coils."
 - (e) Explain how wattmeter is calibrated by using d.c. potentiometer.
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- 2. (a) Explain the construction and working of fluxmeter. What are the advantages and disadvantages ? *10*
 - (b) Explain the construction, working and phasor diagram of a Maxwell-Inductance-capacitance bridge for the measurement of self inductance. *10*
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- 3. (a) Explain the construction, working and theory of Ballistic galvanometer. *10*
 - (b) A moving coil instrument gives a full scale deflection of 10mA when the potential difference across its terminal is 100 mV. Calculate (i) shunt resistance for a full scale deflection corresponding to 100A. (ii) the series resistance for full scale reading with 1000 V. (iii) calculate the power dissipation in each case. *10*
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- 4. (a) Explain the construction and working of single-phase Induction type energymeter. *10*
 - (b) The inductance of a moving iron Ammeter with a full scale deflection of 90° at 1.5A is given by $L = (200 + 400 - 40^2 - \theta^3) \mu H$. Where θ is the deflection in radian from zero position. Estimate the angular deflection of the pointer for a current of 1.0A. *10*
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- 5. (a) Explain the construction and working CT. *10*
 - (b) Explain how iron loss is measured with Epstein Square method. Also explain its construction. *10*
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- 6. Write a short notes (any two) :- *20*
 - (a) Rectifier type instrument
 - (b) Reed type frequency meter
 - (c) Weston type synchroscope.

MASTER