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(Pages : 2)

Name.....

Reg. No.....

THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, DECEMBER 2004

EE 2K 306–ELECTRICAL MEASUREMENTS AND MEASURING INSTRUMENTS

(New Scheme)

Time : Three Hours

Maximum : 100 Marks

1. (a) Describe the various forces needed for proper operation of analog indicating instruments.
   (b) Explain with neat sketch the working of clip on ammeter.
   (c) Explain two wattmeter method of power measurement.
   (d) Describe in detail the working of Trivector meter.
   (e) Derive an expression for bridge sensitivity for a wheatstone bridge with equal arms.
   (f) Describe the Murray–loop test for Localization of ground and short circuit faults in cables.
   (g) Explain with a neat sketch how a DC potentiometer can be used to calibrate a voltmeter.
   (h) How do you measure the magnetising force (H) by using a ballistic galvanometer ?

(8 × 5 = 40 marks)

2. (a) (i) Explain briefly the construction and working of PMMC instruments. Derive an expression for deflecting torque.
   (ii) How is the current range of PMMC instrument extended with the help of shunts ?

(10 + 5 = 15 marks)

Or

(b) (i) Explain with a block diagram the working of integrating type digital voltmeter.
   (ii) A 100/5A, 50 Hz, CT has a bar primary and a rated secondary burden of 12.5 VA. The secondary winding has 196 turns and a leakage inductance of 0.96 mH. With a purely resistive burden at rated full load, the magnetization m.m.f. is 16A and the loss excitation requires 12A. Find the ratio and phase angle errors.

(8 + 7 = 15 marks)

3. (a) Describe the various errors and their compensation in electrodynamometer type wattmeters.

(15 marks)

Or

(b) (i) Describe the construction and working of maz–price maximum demand indicator.
   (ii) What is Phantom loading ? Explain with an example how is it more advantageous than testing with direct loading.

(10 + 5 = 15 marks)

4. (a) (i) Explain Kelvin's Double bridge method of measurement of low resistance.
   (ii) Describe the construction and working of an earth tester. Explain how it can be used for measurement of 'R' of an earthing electrode ?

(9 + 6 = 15 marks)

Or

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(b) (i) Describe the measurement of self inductance using a standard capacitor. Also give the advantages and disadvantages of this method.

(ii) Explain how relative permittivity of dielectric materials can be measured using Schering bridge.

(10 + 5 = 15 marks)

5. (a) (i) Explain 'Standardization'. Describe the procedure of Standardization of a DC potentiometer.

(ii) How do you classify AC potentiometers ? Explain some of its applications.

(8 + 7 = 15 marks)

Or

(b) (i) Describe the method of determination of B–H curve of a magnetic material using :–

(1) Method of reversals. (2) Step by step method.

(ii) Explain the measurement of leakage Flux using Flux meter.

(10 + 5 = 15 marks)

[4 × 15 = 60 marks]