Code: R7310202

R07

III B. Tech I Semester (R07) Supplementary Examinations, May 2012

ELECTRICAL MEASUREMENTS

(Electrical & Electronics Engineering)

Time: 3 hours Max Marks: 80

Answer any FIVE questions
All questions carry equal marks
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1 (a) How the electrical measuring instruments are classified?
(b) A moving coil instrument has a resistance of 10 Ω and gives a full-scale deflection when carrying 50mA. Show how it can be adopted to measure voltage up to 750 V and current 100 A.

2 (a) Explain the advantages of instrument transformers.
(b) A current transformer has a single turn primary and a 200 turns secondary winding. The secondary winding supplies a current of 5 A to a non-inductive burden of 1 Ω resistance. The requisite flux is set up in the core by an mmf of 80 A .The frequency is 50 Hz and the net cross-section of the core is 1000 mm^2.Calculate the ratio and phase angle of the transformer. Also, find the flux density in the core. Neglect the effects of magnetic leakage, iron losses and I^2R losses.

3 A dynamometer wattmeter is used to measure the power factor of a 20 μF capacitor. The pressure coil of the wattmeter having a resistance 1000 Ω and inductive reactance of 15 Ω is connected across a 50 Hz supply. The current coil of the wattmeter, a variable resistor R and a capacitor are connected in series across the same supply. The wattmeter deflection is made zero by adjusting the value of R to 1.65 Ω .If the current coil resistance is 0.1 Ω and its inductance is negligible; determine the power factor of the capacitor

4 Enumerate the different type of tests that are to be carried out on a 1- Φ induction type watt-hour meter. Describe the long period dial test.

5 (a) What are the differences between D.C and A.C potentiometers?
(b) What are the practical difficulties associated with A. C potentiometers?
(c) How the D.C potentiometers are standardized?

6 (a) Describe the substitution method of measurement of medium resistances and list the factors on which the accuracy of the method depends.
(b) A Kelvin bridge is balanced with the following constants. Outer ratio arm 100 Ω and 1000Ω; inner arms ratio 99.92 Ω and 1000.6Ω; resistance of link 0.1Ω; standard resistance 0.00377Ω. Calculate the value of unknown resistance.

7 (a) Draw and explain high voltage Schering bridge with a neat circuit diagram.
(b) What are the special features of high voltage Schering bridge?

8 Explain the construction and working of a ballistic galvanometer.

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