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Third Semester B.E. Degree Examination, June/July 2013
Electrical and Electronic Measurement and Instrumentation

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

1.
 - a. Derive the dimensions of MMF, EMF and flux density in LMTI system. (06 Marks)
 - b. Show that the product $1/\sqrt{\mu t}$ has the dimensions of velocity when μ = permeability and t = permittivity. (06 Marks)
 - c. Derive the bridge balance equation for Kelvin double bridge. (08 Marks)
2.
 - a. Explain the measurement of inductance using Anderson's bridge. Draw the phasor diagram at balance condition. (12 Marks)
 - b. A condenser bushing forms arm AB of a Schering bridge and a standard capacitor of 500pf capacitance and negligible loss, forms AD. Arm BC consists of a non-inductance resistance of 300Ω. When the bridge is balanced arm CD has a resistance of 72.6 Ω in parallel with capacitance of 0.148μF. The supply frequency is of 50Hz. Calculate the capacitance and dielectric loss angle of capacitor. (08 Marks)
3.
 - a. A moving coil ammeter has the coil circuit resistance of 1000 ohm. The range of the ammeter is 0 – 500 μA. Calculate the value of shunt resistance to give a full scale deflection with a current of i) 10mA; ii) 75mA.
Find the value of shunt resistance if 40% deflection is obtained with a current of 100mA. (06 Marks)
 - b. Explain the theory and operation of the comparative deflection method of testing a C.T. by silsbeels method. (10 Marks)
 - c. Explain the current transformer with the help of an equivalent circuit diagram. (04 Marks)
4.
 - a. Explain the construction and working principle of electrodynamicometer Wattmeter for the measurement of power in the circuit. (08 Marks)
 - b. For a 20A, 230V energy meter, the revolutions per kilowatt-hour is 480. If upon test at full load upf the disc makes 40 revolutions in 66 seconds, calculate the error. (06 Marks)
 - c. With a neat block diagram, explain principle of working of electronic energy meter. (06 Marks)

PART – B

5.
 - a. With a neat diagram, explain the construction and working of an electrodynamicometer power factor meter. (10 Marks)
 - b. With a neat diagram, explain the working of an electronic multimeter. (10 Marks)

- 6 a. With neat block diagram, explain the working of dual trace oscilloscope. (10 Marks)
b. With a block diagram, explain the working of a digital storage oscilloscope. (10 Marks)
- 7 a. Classify electrical transducers. (05 Marks)
b. Explain the construction and working of LVDT. Also list the advantages and disadvantages. (10 Marks)
c. Explain photo voltaic cells. (05 Marks)
- 8 a. With neat block diagram, explain the digital data acquisition system. Mention the uses of data acquisition system. (08 Marks)
b. With the help of block diagram, describe a function generator. (08 Marks)
c. Write a note on any one display device. (04 Marks)

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