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Third Semester B.E. Degree Examination, June/July 2023 Electrical and Electronics Measurements

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define sensitivity of Wheatstone bridge and obtain expression for sensitivity of bridge. (10 Marks)
b. Explain the construction and working of megger with neat sketch. (10 Marks)

OR

- 2 a. Describe the working of Anderson's bridge. Derive equation for inductance and quality factor. (10 Marks)
b. Explain sources and detectors in A.C. bridges. (04 Marks)
c. A sheet of Bakelite 5mm thick is tested at 50Hz between electrodes 0.12m in diameter. The shearing bridge employs a standard air capacitor C_2 of 106pf, a standard non-inductive resistance R_4 of $\frac{1000}{\pi}\Omega$ in parallel with a variable capacitor C_4 and a non-inductive variable resistance R_3 balance is obtained with $C_4 = 0.5\mu\text{f}$ and $R_3 = 260\Omega$. Calculate the capacitance, power-factor and relative permittivity of the sheet. (06 Marks)

Module-2

- 3 a. Explain the error in Wattmeter and explain adjustments done to compensate errors in wattmeter. (08 Marks)
b. Explain with the help of neat sketch calibration of energy meter. (06 Marks)
c. A 250V, single phase energy meter has a constant load of 5A passing through it for 8 hours at 0.8pf. If the disc makes 3,200 revolutions during this period, what is the energy meter constant in revolutions per kWh? Calculate the p.f of the load if the number of revolutions made by energy meter is 600, when operating at 250V, 6A for 2 hours. (06 Marks)

OR

- 4 a. Explain the construction and working of dynamometer type power factor meter. (08 Marks)
b. Explain the working of Weston frequency meter. (08 Marks)
c. Explain the working of phase sequence indicator. (04 Marks)

Module-3

- 5 a. What do you mean by shunts and multipliers and derive the expression for shunt and multipliers. (06 Marks)
b. Obtain transformation ratio and phase angle of current transformer with the help of equivalent circuit and phasor diagram. (08 Marks)
c. A current transformer has a turns ratio 1:99 and is rated as 500/5A, 15VA. The magnetizing and core loss components of exciting current are 8A and 4A respectively. Determine the ratio error and phase angle for the rated burden and rated secondary current at 0.8pf leading neglect the resistance and leakage reactance of secondary winding. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Explain the method of obtaining flux density of magnetic material. (08 Marks)
b. Explain Silsbee method of testing CT. (06 Marks)
c. Explain the measurement of leakage factor using search coil. (06 Marks)

Module-4

- 7 a. List the characteristics of DVM. (04 Marks)
b. With the help of block-diagram, explain the working of true RMS voltmeter. (08 Marks)
c. With the help of block-diagram explain the working of ramp type DVM. (08 Marks)

OR

- 8 a. Explain with the help of diagram, integrating type DVM. (08 Marks)
b. With the help of neat sketch, explain the working of Q-meter. (06 Marks)
c. Explain the working of successive approximation type DVM. (06 Marks)

Module-5

- 9 a. Explain LED and LCD displays. (08 Marks)
b. Write short notes on Nixie tube. (06 Marks)
c. Write short notes on:
i) Dot-matrix displays
ii) Bar matrix display. (06 Marks)

OR

- 10 a. With the help of neat sketch, explain the working of strip-chart recorder. (06 Marks)
b. Explain with the help of block diagram ECG. (06 Marks)
c. Explain the working of X-Y recorder with neat sketch. (08 Marks)
