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17EE36

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019 Electrical and Electronic Measurements

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. List the limitations of wheatstone Bridge and explain how low resistance is measured by KDB. (08 Marks)
- b. With a neat circuit diagram derive the balancing equation for Maxwell Inductance – Capacitance Bridge. (06 Marks)
- c. A Maxwell's capacitance bridge shown in Fig Q1(c) is used to measured an unknown inductance in comparison with capacitance. The various values at balance, $R_2 = 400\Omega$; $R_3 = 600\Omega$, $R_4 = 1000\Omega$; $C_4 = 0.5\mu F$. Calculate the values of R_1 and L_1 calculate also the value of storage (Q) factor of coil if frequency is 1000 Hz. (06 Marks)

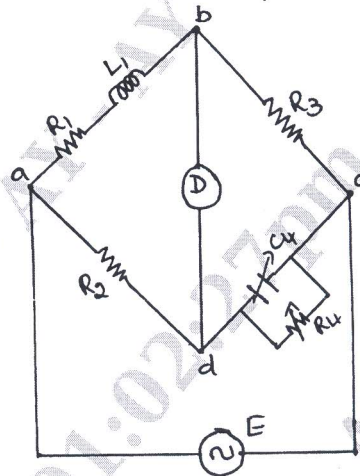


Fig Q1(c)

OR

- 2 a. Explain in brief fall of potential method for earth resistance measurement. (08 Marks)
- b. Describe the working of Schering bridge. Derive the equation for capacitance and dissipation factor. Draw the phasor diagram of the bridge under balance conditions. (12 Marks)

Module-2

- 3 a. Explain the construction and working principle of electro-dynamometer Wattmeter for the measurement of power in the circuit. (08 Marks)
- b. Discuss the constructional features and working principle of rotating type phase sequence indicator. (06 Marks)
- c. A three phase induction motor draws a power input at a voltage of 250V, 20A, and 0.8 power factor lag: Find percentage error in wattmeter reading if ,
i) Pressure coil is on supply side ii) Current coil is on supply side. Assume current coil resistance and pressure coil resistance = 0.2Ω and 5000Ω . (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

- 4 a. Explain the error in a LPF Wattmeter and give the adjustments done to compensate for the error. (08 Marks)
- b. Explain the working principle of Weston frequency 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 3200 revolutions during this period, what is Energy meter constant in revolutions per kilo-watt-hour? Calculate the pf of the load, if the number of revolutions made by the energy meter is 600, when operating at 250V, 6A for 2 hrs. (06 Marks)

Module-3

- 5 a. Explain the construction and theory of instrument transformer. (06 Marks)
- b. Explain the characteristics of current transformer. (08 Marks)
- c. Explain the measurement of magnetizing force (H). (06 Marks)

OR

- 6 a. What is shunt? How it is used to extend the range of an ammeter. (06 Marks)
- b. With neat circuit diagram, explain Silsbee's method of testing C.T. (08 Marks)
- c. Explain the measurement of leakage factor using search coil. (06 Marks)

Module-4

- 7 a. With a block diagram, explain the working of a true R.M.S responding voltmeter. (08 Marks)
- b. With a block diagram, explain the working of a Ramp type DVM. (08 Marks)
- c. List the advantages of electronic energy meter over the conventional energy meter. (04 Marks)

OR

- 8 a. List the performance characteristics of a Digital voltmeter. (07 Marks)
- b. With a neat sketch, explain the working of the Q-meter. (07 Marks)
- c. With a neat block diagram, explain the principle of working of electronic energy meter. (06 Marks)

Module-5

- 9 a. Explain LED and LCD displays. (10 Marks)
- b. Write short note on nixie tube. (05 Marks)
- c. Write a short note on strip-chart recorder. (05 Marks)

OR

- 10 a. Write a short note on types of segment displays. (06 Marks)
- b. With a neat sketch, explain the working of a X-Y recorder. (08 Marks)
- c. Write a short note on Null balance recorders. (06 Marks)
