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Third Semester B.E. Degree Examination, Jan./Feb. 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. Explain measurement of medium resistance by wheat stone bridge method. (06 Marks)
- b. Explain measurement of low resistance by Kelvin's double bridge method. (08 Marks)
- c. Explain measurement of earth resistance by fall of potential method. (06 Marks)

OR

- 2 a. With the help of neat circuit diagram, explain the measurement of inductance by Maxwell's inductance and capacitance bridge. (12 Marks)
- b. A Maxwell's inductance comparison bridge is shown in Fig.Q.2(b). Arm ab consists of a coil with inductance L_1 and resistance r_1 in series with a non inductive resistance R . Arm bc and coil ad are each a non inductive resistance of 100Ω . Arm cd consists of standard variable inductor L_2 of resistance 32.7Ω . Balance is obtained when $L_2 = 47.8\text{mH}$ and $R = 1.36\Omega$. Find the resistance and inductance of coil in arm ab. (08 Marks)

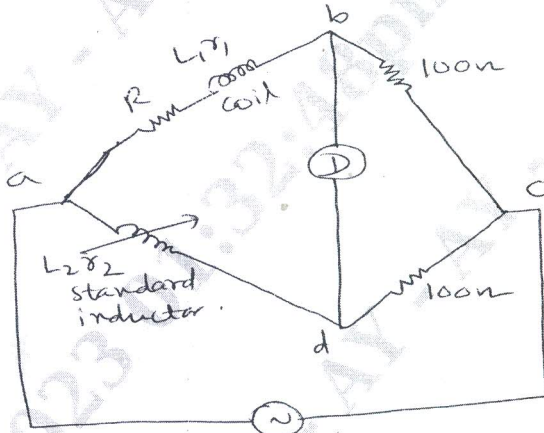


Fig.Q.2(b)

Module-2

- 3 a. With the help of neat circuit, explain construction and working of single phase energy meter. (10 Marks)
- b. With the help of neat sketch, explain construction and operation of single phase dynamometer type power factor meter. (10 Marks)

OR

- 4 a. Explain construction and operating principle of Weston frequency meter. (10 Marks)
- b. With the help of neat sketch, explain construction and working principle of phase sequence indicator. (10 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.

Module-3

- 5 a. Draw the equivalent circuit and phasor diagram of a current transformer. Derive the expressions for ratio and phase angle errors. (12 Marks)
- b. A potential transformer, ratio 1000/100 volt has the following constants
 Primary resistance = 94.5Ω
 Secondary resistance = 0.86Ω
 Primary reactance = 66.2Ω
 Total equivalent reactance = 110Ω
 No load current = 0.02A at 0.4 power factor.
 Calculate: i) Phase angle error at no load ii) Burden in VA at unity power factor at which the phase angle will be zero. (08 Marks)

OR

- 6 a. Explain Silsbee's method of testing CT. (10 Marks)
- b. Explain measurement of flux density in ring specimens. (10 Marks)

Module-4

- 7 a. Explain construction and working of true rms reading voltmeter. (10 Marks)
- b. With the help of neat circuit, explain working of electronic multimeter. (10 Marks)

OR

- 8 a. Explain construction and working principle of 'Q' meter. (10 Marks)
- b. Explain with the help of block diagram construction and working of electronic energy meter. (10 Marks)

Module-5

- 9 a. With the help of neat sketch, explain the construction and working principle of strip chart recorders. (10 Marks)
- b. With the help of neat sketch, explain the working of cathode ray tube. (10 Marks)

OR

- 10 a. With the help of neat sketch, explain working of xy recorders. (10 Marks)
- b. Explain construction and working of ultra violet recorders. (10 Marks)

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