

CBCS SCHEME

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18EE36

Third Semester B.E. Degree Examination, July/August 2021 Electrical and Electronic Measurements

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

1. a. Derive an expression for the unknown inductance under balanced condition using Hay's bridge. Draw the phasor diagram. (08 Marks)
b. With necessary circuit diagram deduce an expression for sensitivity of the Whetstone's bridge. Mention the limitation of Whetstones bridge. (08 Marks)
c. Discuss on the advantages of Maxwell's inductance capacitance bridge. (04 Marks)
2. a. Derive an expression for unknown capacitance under balance condition using low voltage Schering bridge. Draw the phasor diagram for the bridge under balanced condition. (08 Marks)
b. With neat diagram derive the balancing equation for Kelvin's double bridge. (07 Marks)
c. Explain the fall of potential method for earth resistance measurement. (05 Marks)
3. a. A Wattmeter has current coil and pressure coil resistance of 0.3Ω and 4500Ω respectively. The load derives a current of 15A at 250V with 0.8pf lag. Evaluate the percentage error in the wattmeter reading when i) Pressure coil is connected on supply side ii) Current coil is connected on supply side. (05 Marks)
b. With a neat sketch explain the three phase reactive power measurement by two wattmeter method. (08 Marks)
c. With a neat diagram explain with working of Weston frequency meters. (07 Marks)
4. a. A 230V single phase energy meter has a constant load of 5A passing through it for 7 hours at 0.85 pf lag. If the meter disc revolves 2300 revolution during this period. What is the energy meter constant in terms of revolution/kwh. Calculate the power factor of the load if the number of revolution made by the meter are 1432 revolutions when operating at 235V, 6A for 5 hours. (05 Marks)
b. Explain the working principle and construction of single phase electro dynamometer powerfactor meter with a neat diagram. (08 Marks)
c. Explain the special features incorporated in an electro dynamometer type of wattmeter so that it can be used for low power factor application. (07 Marks)
5. a. Explain the operation of comparative deflection method of testing a current transformer by Silsbee's method. (08 Marks)
b. A moving coil meter gives fullscale deflection with a current of 5mA. If the coil of the instrument has a resistance of 10Ω , how it can be adopted to work as
i) Ammeter of range 0-10A
ii) Voltmeter of rang 0-10V. (05 Marks)
c. With a neat diagram, explain the measurement of magnetizing force (H). (07 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.

- 6 a. What do you mean by shunts and multipliers, derive the expression for shunt and multiplier. (07 Marks)
b. Explain the method to measure flux using Ballistic galvanometer with a neat sketch. (08 Marks)
c. Explain the measurement of leakage factor using search coil. (05 Marks)
- 7 a. With a block diagram, explain the operation of successive approximation type of digital voltmeter. (08 Marks)
b. Using a block diagram schematic, explain the loading of electronic energy meter. (08 Marks)
c. List the advantages of electronic voltmeter. (04 Marks)
- 8 a. With a block diagram, explain the operation of true R.M.S responding voltmeter. (08 Marks)
b. Describe the working principle of Q meter with a circuit diagram. (08 Marks)
c. List the advantages of electronic energy meter. (04 Marks)
- 9 a. With a diagram, explain the operation of X-Y recorders. (08 Marks)
b. With a diagram, explain the working of LCD display. (07 Marks)
c. With a block diagram, explain the operation of circular chart recorder. (05 Marks)
- 10 a. With a diagram, explain the operation of Nixie tube. (08 Marks)
b. With a diagram, explain the operation of liquid vapour display. (07 Marks)
c. With a block diagram, explain the strip chart recorder. (05 Marks)
