



CBCS SCHEME

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17EE36

Third Semester B.E. Degree Examination, Jan./Feb.2021 Electrical & 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. With a neat sketch, explain Kelvins double bridge, obtain an expression for the unknown low resistance. (08 Marks)
- b. Discuss fall of potential method of measurement of Earth resistance. (07 Marks)
- c. The four impedances of ac bridges are,
 $z_1 = 400 \angle 50^\circ \Omega$, $z_2 = 200 \angle 40^\circ \Omega$, $z_3 = 800 \angle -50^\circ \Omega$, $z_4 = 400 \angle 20^\circ \Omega$
Find out whether bridge is balanced under these conditions or not. (05 Marks)

OR

- 2 a. Explain Maxwell's Inductance bridge with neat diagram with advantages and disadvantages. (08 Marks)
- b. With a neat circuit diagram, explain operation of modified Desautys bridge. (06 Marks)
- c. Discuss the method of determining capacitance and dissipation factor using voltage shering bridge. (06 Marks)

Module-2

- 3 a. Discuss the errors and their compensating techniques used in dynamometer type wattmeter. (08 Marks)
- b. With a neat sketch explain operation of Weston frequency meter. (06 Marks)
- c. A wattmeter has a current coil of resistance 0.2Ω and pressure coil of resistance 5000Ω is connected to measure the power consumed by load. Calculate the percentage error in the reading of wattmeter when the load takes 20 A at 250 V with 0.8 power factor when,
(i) The pressure coil is connected on supply side.
(ii) When current coil is connected on supply side.
(iii) What load current would give equal errors with two connections? (06 Marks)

OR

- 4 a. Explain working principle and construction of single phase electrodynamic power factor meter. (08 Marks)
- b. Explain operation of Lpf dynamometer type wattmeter. (07 Marks)
- c. The name plate of single phase energy meter reads as 250 V, 20 A, 1800 rev/kWH. The meter is tested at $\frac{3}{4}$ load and upf. The meter makes 20 revolutions in 10 seconds. Determine the % error in the reading of the energy meter. (05 Marks)

Module-3

- 5 a. Describe with a neat sketch measurement of Iron loss using wattmeter method. (08 Marks)
- b. With a current of 25 mA, if the coil of the instrument has a resistance of 10Ω , how it can be adopted to work as,
(i) Ammeter of range 0 – 20 A.
(ii) Voltmeter of range 0 – 120 V. (05 Marks)
- c. Difference between CT and PT and explain errors in CT. (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.

OR

- 6 a. Explain the measurement of leakage factor using search coil. (08 Marks)
b. Explain Hopkinson's permeameter. (06 Marks)
c. What is shunt? How it is used to extend range of an ammeter? (06 Marks)

Module-4

- 7 a. Explain the operation of true rms reading voltmeter. (07 Marks)
b. With a neat diagram, explain the working of electronic multimeter. (07 Marks)
c. Explain the working of Ramp type digital voltmeter. (06 Marks)

OR

- 8 a. Explain working of an electronic energy meter, list the drawbacks of traditional energy meter. (08 Marks)
b. Explain integrating type DVM with neat sketch. (07 Marks)
c. A coil with a resistance of 12Ω is connected in direct connection mode of Q meter resonance occurs. When oscillator frequency is 1 MHz and the resonating capacitor is set at 75 pf. Calculate % error introduced in calculate value of Q by 0.02Ω insertion resistance. (05 Marks)

Module-5

- 9 a. Write a note on Nixie tube with neat sketch. (07 Marks)
b. With a neat diagram, explain LED display. (07 Marks)
c. Write a note on Dot Matrix display. (06 Marks)

OR

- 10 a. With a neat sketch, explain working of X-Y recorder. (07 Marks)
b. Write a note on LVDT type recorder. (07 Marks)
c. Explain the block diagram of ECG (Electro Cardio graph) (06 Marks)
