CBCS SCHEME

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18EE36

Third Semester B.E. Degree Examination, June/July 2025
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. Draw a circuit of a Kelvins Double bridge used for the measurement of low resistance. Derive the condition for balance. **(10 Marks)**

b. Describe working of Schering bridge. Derive the equations for capacitance and dissipation factor. Draw phasor diagram of the bridge under condition of balance. **(10 Marks)**

OR

2 a. Four arms of a bridge are arranged as follows: AB is a pure resistance of 1000Ω in parallel with a capacitance 0.5 μF ; BC is a pure resistance of 1000Ω in series with a of 1000Ω with a capacitance of 0.5μF ; CD is a coil of inductance 30mH in series with a resistance of 200Ω. Find the constants of DA to balance the bridge. Supply frequency is 1000Hz. **(10 Marks)**

b. Write briefly on the significance of 'Shields' used in AC bridge circuits. Hence, discuss on the 'shielding' of resistors and capacitors of the circuit. **(10 Marks)**

Module-2

3 a. Explain the construction of induction type single phase energy meter. **(10 Marks)**

b. Explain single phase dynamo meter type power factor meter. **(10 Marks)**

OR

4 a. Explain the construction and working principle of Weston frequency meter. **(10 Marks)**

b. Explain Rotating type phase sequence indicator. **(10 Marks)**

Module-3

5 a. Discuss briefly on the shunts and multipliers used for extension of meters in electrical measurements. **(10 Marks)**

b. A moving coil ammeter has fixed shunt of 0.01Ω with a coil resistance of 750Ω and a voltage drop of 400 mv across it, the full scale deflection is obtained.
i) Calculate the current through shunt
ii) Calculate the resistance of meter to give full scale deflection if the shunted current is 50A. **(10 Marks)**

OR

6 a. A CT has a single turn primary and a 200 turns secondary winding. The secondary winding supplies a current of 5A to a non inductive burden of 1Ω resistance. The requisite flux is set up in the core by an mmf of 80A. The frequency is 50Ht and the net cross section of the core is $1000mm^2$.
Calculate the ratio and phase angle of the transformers. Also find the flux density in the core. Neglect the effect of magnetic leakage iron losses and I^2R losses. **(10 Marks)**

b. Draw the equivalent circuit and phasor diagram of a potential transformer. Derive the expressions for its ratio and phase angle errors. **(10 Marks)**

Module-4

7 a. With a block diagram explain the working of a Ramp type DVM. **(10 Marks)**

b. What is a Q meter? Discuss how the unknown components can be connected to its test terminals. **(10 Marks)**

OR

8 a. Explain true rms reading voltmeter. **(10 Marks)**

b. Write short notes an Integrating type DVM. **(10 Marks)**

Module-5

9 a. Draw and explain CRT tube. **(10 Marks)**

b. What is X – Y recorder? Explain with neat diagram the working of X – Y recorder. **(10 Marks)**

OR

10 a. What is strip chart recorders? Explain with neat diagram the working of strip chart recorder. **(10 Marks)**

b. Explain the principle and working of LVDT. **(10 Marks)**

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