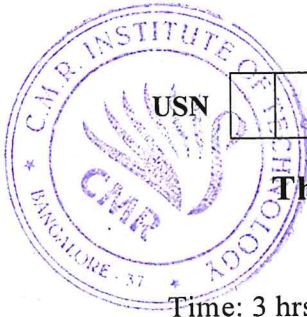


# CBCS SCHEME



18EE36

## Third Semester B.E. Degree Examination, Dec.2019/Jan.2020 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. Define 'Voltage Sensitivity' of a Galvanometer. Obtain an expression for bridge sensitivity  $S_b$  in terms of voltage sensitivity and bridge parameters. When will the bridge sensitivity be maximum? (07 Marks)
- b. Explain the necessity of Earthing. Explain measurement of Earth Resistance by fall of potential method. (06 Marks)
- c. Explain Maxwell Inductance capacitance bridge and derive its balance equation. (07 Marks)

OR

- 2 a. Explain the significance of 'low resistance' measurement. With a neat circuit diagram, explain Kelvin Double Bridge and derive its balance equation. (08 Marks)
- b. The four arms of an ac bridge have impedance values of  $Z_1 = 400 \angle 50^\circ$  ohm,  $Z_2 = 200 \angle 40^\circ$  ohm,  $Z_3 = 800 \angle -50^\circ$  ohm and  $Z_4 = 400 \angle 20^\circ$  ohm. Find whether the bridge is balanced under this working condition. (04 Marks)
- c. With a neat circuit diagram, explain modified De-Sauty bridge for measurement of capacitance of an imperfect capacitor and derive its balance equation. (08 Marks)

### Module-2

- 3 a. Derive the torque equation of a single phase Dynamometer type Wattmeter. (07 Marks)
- b. Explain the various adjustments required in Energy meter for the accurate reading. (06 Marks)
- c. With a neat sketch, explain the construction and working of a single phase Dynamometer type Power Factor meter. (07 Marks)

OR

- 4 a. Explain: i) Phase sequence Indicators ii) Determination of power factor of a balanced three phase load, using Wattmeter readings  $W_1$  and  $W_2$  obtained from two Wattmeter method of power measurement. (08 Marks)
- b. Explain the various errors and adjustments in Dynamometer type Wattmeter. (06 Marks)
- c. With a neat sketch, explain the construction and working of Weston frequency meter. (06 Marks)

### Module-3

- 5 a. What are shunts and multipliers? Derive expressions to find the required values of shunts and multipliers. (06 Marks)
- b. What are Instrument Transformers? Differentiate between Current Transformers and Power Transformers. (06 Marks)
- c. Explain the current transformer with the help of an equivalent circuit diagram and a phasor diagram, write expressions for 'ratio error' and 'phase angle error' of a CT. (08 Marks)

1 of 2

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.

10 JAN 2020

OR

- 6 a. Explain what is meant by testing of Instrument Transformers, with a neat circuit diagram explain silsbee's method of testing CT. (06 Marks)
- b. State the advantages and disadvantages of using Instrument transformers. (06 Marks)
- c. Describe experimental method of measurement of flux density in a Ring specimen of magnetic material using ballistic galvanometer. (08 Marks)

Module-4

- 7 a. What are the advantages of electronic instruments? (04 Marks)
- b. Explain the construction and working principle of a true RMS Reading Voltmeter. (08 Marks)
- c. Explain the construction and working of a RAMP type digital voltmeter. (08 Marks)

OR

- 8 a. Explain, what are Q meters? (04 Marks)
- b. Explain the construction and working of a successive approximation type DVM. (08 Marks)
- c. Explain the principle and working of an electronic energy meter with a block diagram. What are the advantages of electronic energy meters over conventional Electromechanical Energy Meters? (08 Marks)

Module-5

- 9 a. Explain with suitable sketch, working of a Cathode Ray Tube (CRT). (06 Marks)
- b. Explain the principle and operation of (i) Strip chart recorders (ii) Galvanometer recorders. (08 Marks)
- c. Write a note on Display Devices. (06 Marks)

OR

- 10 a. Explain with a neat sketch ECG recorders? (08 Marks)
- b. Write notes on: i) LEDs ii) LCDs. (06 Marks)
- c. Explain what are: i) Nixes ii) Liquid Vapour Devices. (06 Marks)

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