CBCS SCHEME

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18EE36

Third Semester B.E. Degree Examination, June/July 2024
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. With a neat circuit diagram, explain the principle of operation of Kelvin's Double Bridge and derive its balance equation. **(10 Marks)**

b. With a neat circuit diagram and phasor diagram, explain the operation of Anderson's Bridge. Also obtain the balance equation. **(10 Marks)**

OR

2 a. With a neat sketch, explain the construction and working of Megger. **(10 Marks)**

b. The four arms of an ac bridge have impedance values of $Z_1 = 400\angle 50^\circ\ \Omega$, $Z_2 = 200\angle 40^\circ\ \Omega$, $Z_3 = 800\angle -50^\circ\ \Omega$ and $Z_4 = 400\angle 20^\circ\ \Omega$. Find whether the bridge is balanced under this working condition. **(04 Marks)**

c. With neat circuit diagram and phasor diagram, explain the operation of low voltage Schering Bridge. Also obtain the balance equation. **(06 Marks)**

Module-2

3 a. Explain the working and operation of Low Power Factor (LPF) Wattmeter. **(05 Marks)**

b. The constant of energy meter is 750 rev/KWh. Calculate the number of revolutions made by it. When connected to a load carrying 100 A at 230 V and 0.8 power factor in 30 seconds. If it makes 110 revolutions in 30 seconds. Find the percentage error. **(05 Marks)**

c. With a neat sketch, explain the construction and working of Western frequency meter. **(10 Marks)**

OR

4 a. Derive the torque equation of a single phase dynamometer type wattmeter. **(07 Marks)**

b. What is creeping in energy meter? How it is prevented? **(03 Marks)**

c. With neat sketch, explain the construction and working of a single phase dynamometer type power factor meter. **(10 Marks)**

Module-3

5 a. Explain the construction of CT and PT with necessary phasors. **(10 Marks)**

b. Obtain an expression for ratio and phase angle error in a current transformer. **(10 Marks)**

OR

6 a. Explain Silsbee's method of testing current transformer with the help of neat sketch and phasor diagram. **(10 Marks)**

b. Explain the method of measurement of flux density in a ring specimen of magnetic material using ballistic galvanometer. **(10 Marks)**

Module-4

7 a. With a neat block diagram, explain the working of true RMS reading voltmeter. (10 Marks)

b. Explain integrating type digital voltmeter with a neat block diagram. (10 Marks)

OR

8 a. With neat block diagram, explain the principle of operation of electronic energy meter. (10 Marks)

b. Explain the construction and working of successive approximation type digital voltmeter. (10 Marks)

Module-5

9 a. Explain with suitable sketch, working of a Cathode Ray Tube (CRT). (10 Marks)

b. Explain the principle and operation of:
   (i) Strip chart recorders
   (ii) Galvanometer recorders (10 Marks)

OR

10 a. Write notes on: (i) LEDs (ii) Nines (10 Marks)

b. With a neat block diagram, explain X-Y recorders. (10 Marks)

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