

CBGS SCHEME

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15EE36

Third Semester B.E. Degree Examination, Dec.2019/Jan.2020

Electrical and Electronic Measurements

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Derive the dimensions of MMF, EMF and FLUX density in LMIT system. (05 Marks)
- b. Explain with neat sketch how megger is used for the measurement of very high resistance. (05 Marks)
- c. Derive the bridge balance equation for Kelvin's double bridge. (06 Marks)

OR

- 2 a. Explain the measurement of inductance using Anderson's bridge. Draw the phasor diagram. (06 Marks)
- b. Explain sources and detectors used in A.C. bridges. (04 Marks)
- c. The four arms of AC bridges are as,
Arm ab : an insulating material representing an imperfect capacitor.
Arm bc : a non inductive resistance of 1200Ω
Arm da : a loss free capacitor of $100 \mu\text{F}$.
Arm cd : a resistance 300Ω in parallel with capacitor of $0.6 \mu\text{F}$.
An A.C supply of 50 Hz is connected across A.C and detector is connected across bd.
Determine capacitance equivalent series resistance and loss angle of insulating material. (06 Marks)

Module-2

- 3 a. Derive the torque equation for dynamometer type wattmeter. (06 Marks)
- b. Explain the errors and adjustments done in energy meter to read accurately. (06 Marks)
- c. The constant of energy meter is 750 revolutions/kwh. Calculate the number of revolutions made by it, when connected to a load carrying 100 A at 230 V and 0.8 p.f. in 30 seconds. If it makes 110 revolutions in 30 seconds. Find the percentage error. (04 Marks)

OR

- 4 a. With a neat diagram, explain the construction of single phase dynamometer type power factor meter. (08 Marks)
- b. Explain the construction and operation of Weston frequency meter. (08 Marks)

Module-3

- 5 a. Explain the theory and operation of a comparative deflection method of testing a C.T by Silsber's test method. (06 Marks)
- b. Explain the P.T with the help of an equivalent circuit diagram. (04 Marks)
- c. A current with 5 primary turns has a secondary burden consisting of a resistance of 0.16Ω and an inductive reactance of 0.12Ω , when the primary current is 200 A, the magnetizing current is 1.5 A and the iron loss current is 0.4 A. Find the number of secondary turns needs to make the current ratio 100.1 and the phase angle. (06 Marks)

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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 wattmeter method of measuring the iron loss. (06 Marks)
b. Describe the method of measurement of flux density. (06 Marks)
c. Explain Hopkinson's permeameter. (04 Marks)

Module-4

- 7 a. With a neat diagram, explain the working of a true R.M.S responding voltmeter. (06 Marks)
b. Explain with a block diagram the working of a Ramp type digital voltmeter. (05 Marks)
c. Explain the operation of an electronic multimeter to measure current, voltage and resistance. (05 Marks)

OR

- 8 a. Explain in brief the operation of successive approximate type of digital voltmeter, with a neat sketch. (06 Marks)
b. With a neat block diagram, explain the principle of working of electronic energy meter. (05 Marks)
c. Explain principle of Q-meter. (05 Marks)

Module-5

- 9 a. Write short note on LCD display. (05 Marks)
b. Explain the theory and working of an LED. (05 Marks)
c. Draw and explain the structure and main components of conventional cathode ray tube. (06 Marks)

OR

- 10 a. Explain the construction and working of LVDT. (05 Marks)
b. With a neat sketch, explain the working of an X-Y recorder. (06 Marks)
c. With the help of neat block diagram, briefly explain ECG machine. (05 Marks)

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