CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐

Third Semester B.E. Degree Examination, Aug./Sept. 2020
Electrical & 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 the sensitivity of wheat stone's bridge with the necessary circuit diagram. Hence deduce the expression for sensitivity of the bridge SB **(08 Marks)**
   b. With neat circuit diagram, derive the balancing equation for Maxwell Inductance-Capacitance bridge. **(06 Marks)**
   c. Explain in brief fall of potential method for earth resistance measurement. **(06 Marks)**

OR

2 a. With help of circuit diagram, explain the Anderson's bridge for measuring self-inductance. **(08 Marks)**
   b. Describe the working of schering bridge. Derive the equation for capacitance and dissipation factor. **(06 Marks)**
   c. A schering bridge has the following constants. Arm AB- capacitor 2.5 μF in parallel with 50 K ohm ; Arm AD – resistance of 200 K ohm, Arm BC – Capacitance of 0.5 μF; Arm CD – unknown capacitance Cx and Rx is series and frequency 1 kHz. Determine the unknown capacitance and dissipation factor. **(06 Marks)**

Module-2

3 a. Derive the torque equation of single phase electro dynamometer type wattmeter. **(08 Marks)**
   b. Explain how power can be measured in a three phase circuit two wattmeter method with the help of phasor diagram for balanced star connected load. **(08 Marks)**
   c. If the reading on two wattmeters in 3-φ balanced load are 836 W and 224 W, the latter reading being obtained after the reversal of current coil connections, calculate the power factor of the load. **(04 Marks)**

OR

4 a. Discuss the various adjustments required in energy meter for the accurate reading. **(08 Marks)**
   b. A single phase energy meter constant of a 230 V, 10 A watthour meter is 1800 revolutions per kWh. The meter is tested at half load and rated voltage and unity power factor. The meter is found to make 80 revolutions in 138 sec. Determine the meter error at half load. **(06 Marks)**
   c. With the help of neat sketch, explain the construction and working of Weston frequency meter. **(06 Marks)**

Module-3

5 a. Describe the equivalent circuit and vector diagram of a current transformer, write the expression for transformation ratio and phase angle error. **(08 Marks)**
   b. What is shunt? How it is used to extend the range of an ammeter? **(06 Marks)**
   c. Explain the construction and theory of instrument transformer. **(06 Marks)**

OR

6   a. With neat circuit diagram, explain Silsbee's method of testing C.T.   (08 Marks)
    b. Explain the measurement of magnetizing force (H).   (06 Marks)
    c. Explain the measurement of leakage factor using search coil.   (06 Marks)

Module-4

7   a. With a block diagram, explain the working of a TRUE RMS responding voltmeter.

                                                                                               (08 Marks)
    b. With a block diagram, explain the working of a Ramp type DVM.   (08 Marks)
    c. List the advantages of electronic instruments.   (04 Marks)

OR

8   a. List the performance characteristics of a digital voltmeter.   (07 Marks)
    b. With a neat sketch, explain the working of the Q-meter.   (07 Marks)
    c. With a neat block diagram, explain the principle of working of electronic energy meter.

                                                                                               (06 Marks)

Module-5

9   a. Explain LED and LCD displays.   (08 Marks)
    b. Explain neatly about segment and Dot matrix displays.   (06 Marks)
    c. Write a short note on strip–chart recorder.   (06 Marks)

OR

10 a. With neat sketch, explain the working of a X-Y recorder.   (08 Marks)
    b. With the help of neat block diagram, explain ECG machine. Write important features of
        ECG machine.   (08 Marks)
    c. Write a short note on Null balance recorders.   (04 Marks)

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