CBCS SCHEME

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Third Semester B.E. Degree Examination, July/August 2022
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 sensitivity of galvanometer. Draw Wheatstone's bridge and derive balance equation. **(08 Marks)**

   b. A Wheatstone Bridge has $P = 1K\Omega$, $Q = 100\Omega$, $R = 2005\Omega$ and $S = 200$. Find ΔR if bridge is not balanced. If the galvanometer sensitivity is (S_i) $10mm/\mu A$, applied voltage is 5V and internal resistance of galvanometer is 100Ω. Find the deflection of the galvanometer. **(12 Marks)**

OR

2 a. Draw a neat circuit diagram and explain Desauty's modified bridge and derive relevant equation. **(08 Marks)**

   b. Explain how Schering bridge can be used to measure relative permittivity of dielectric material. **(08 Marks)**

   c. Explain fall of potential method of measuring earth resistance. **(04 Marks)**

Module-2

3 a. Derive the torque equation of a dynamometer type of wattmeter. List the errors that occur in it. **(08 Marks)**

   b. Explain :
      i) Weston frequency meter
      ii) Phase sequence indicators. **(12 Marks)**

OR

4 a. Explain the construction and working of a single phase power factor meter. **(08 Marks)**

   b. A 230V energy meter disc makes 10 revolutions when connected to a resistive load of 600W in 10 mins. Calculate the meter constant. **(06 Marks)**

   c. Discuss the various adjustment required in energy meters for accurate reading. **(06 Marks)**

Module-3

5 a. What are shunts and multipliers and explain how they are used to extend instrument range derive relevant expressions. **(08 Marks)**

   b. A moving coil meter gives full scale deflection with a current of 5mA. If the coil of the instrument has a resistance of 10Ω how can it be adopted to work as :
      i) Ammeter of range (0 – 10A)
      ii) Voltmeter of range (0 – 10V). **(08 Marks)**

   c. Explain turns compensation used instrument transformers. **(04 Marks)**

OR

6 a. Draw a neat circuit diagram and explain Silbee's method of testing Current Transform (CT). **(12 Marks)**

   b. With the help of a neat circuit diagram explain how flux density can be measured in a ring specimen. **(08 Marks)**

Module-4

7 a. List the advantage of electronic instruments. **(04 Marks)**
   b. Explain construction and working of :
      i) True RMS reading voltmeter
      ii) RAMP type digital voltmeter. **(16 Marks)**

OR

8 a. Draw the block diagram of a electronic energy meter and explain its working. List its advantages. **(12 Marks)**
   b. Explain the construction and working of a successive approximation type DVMS. **(08 Marks)**

Module-5

9 a. With relevant diagrams explain :
      i) Seven segment displays
      ii)Liquid crystal displays. **(08 Marks)**
   b. Explain the working of Cathode Ray Tube (CRT) with a neat diagram. **(08 Marks)**
   c. What are Bar graph displays and where are they used? **(04 Marks)**

OR

10 a. List the different types of recording devices and explain LVDT and strip chart types. **(10 Marks)**

   b. Explain the following :
      i) Nixie tubes
      ii) ECG. **(10 Marks)**

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