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Total No. of Pages : 02

Total No. of Questions : 09

B. Tech. (EE) PT (Sem.-2)

ELECTRICAL MEASUREMENT & INSTRUMENTS

Subject Code : BTEE-303

M.Code : 71536

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A**1. Answer briefly :**

- a) List the base units of SI.
- b) What is the significance of shunts? Explain.
- c) Explain the disadvantages of PMMC.
- d) What do you mean by power factor? Explain its significance.
- e) Discuss advantages and disadvantages of the Maxwell's bridge.
- f) Discuss briefly the various sources of error in A.C. bridges.
- g) Why calibration is required? Discuss.
- h) Discuss the significance of instrument transformers.
- i) What do you mean by T/W ratio? Explain.
- j) Define bridge sensitivity. How is it related to the voltage sensitivity of the galvanometer?

SECTION-B

2. Discuss the construction of a resistance standard. Describe the techniques used to minimize errors in them.

3. Discuss in detail various operating torques needed for proper operation of an analog indicating instruments.
4. Explain the methods of separation of iron losses into their two components : eddy current and hysteresis losses if the maximum value of flux density is maintained constant and
 - a) frequency is varied keeping the form factor constant
 - b) form factor is varied keeping the frequency constant.
5. Explain the function and working of Wagner Earth Devices.

SECTION-C

6. A slide wire potentiometer is used to measure the voltage between two points of a certain d.c circuit. The potentiometer reading is 1.0V. Across the same two points when a 10,000 Ω/V voltmeter is connected, the indicated reading on the voltmeter is 0.5V on its 5V range. Calculate the input resistance between the two points.
7. Discuss the different problems associated with measurement of low resistances. Explain the principle of working a Kelvin Double Bridge and explain how the effect of contact resistance and resistance of leads is eliminated.
8. A current transformer of nominal ratio 1000/5 A, is operating with total secondary impedance $0.4 + j0.3 \Omega$. At rated current the components of primary current associated with the core magnetizing and the core loss effects are respectively 6A and 1.5A. The primary winding has 4 turns. Calculate the ratio error and phase angle at rated primary current if the secondary winding has :
 - a) 800 turns
 - b) 795 turns
9. Discuss the following :
 - a) Self-balancing potentiometer
 - b) Determination of B-H curve

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.