[Total No. of Questions - 9] [Total No. of Printed Pages - 2]
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16103(D) - 0 DEC 2016

B. Tech 3rd Semester Examination

Electrical and Electronic Measurements (CBS)

EEE-301

Time : 3 Hours **Max. Marks : 60**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Candidates are required to attempt five questions in all, selecting one question from each of the sections A, B, C & D of question paper and all the subparts of the questions in Section E. Use of scientific calculator is permitted.

SECTION - A

1. (a) Describe the relative limiting error. Also discuss the concept of combination of quantities with limiting errors. (5)

   (b) What is drift? Explain the different types of drifts with sketches of input-output relationships in each case. (5)

2. (a) Explain the loading effects due to shunt connected instruments. (5)

   (b) Current was measured during a test as 30.4A, flowing in a resistor of 0.105Ω. It was discovered later that the ammeter reading was low by 1.2 percent and the marked resistance was high by 0.3 percent. Find the true power as a percentage of the power that was originally calculated. (5)

SECTION - B

3. (a) Explain the operating principle of Electrodynamometer type instrument and also derive torque equation of Electrodynamometer instrument. (6)

   (b) Explain the dynamic behavior of Galvanometer. (4)

4. (a) Describe the methods used for localizing ground and short circuit faults. (5)

   (b) Derive the equations for balance in case of Maxwell's inductance and capacitance bridge. Draw the phasor diagram for balance conditions. (5)

SECTION - C

5. (a) Explain the working of rotating field power factor meter in detail. (5)

   (b) Explain the working of Weston type frequency meter in detail. (5)

6. (a) Explain the principle and working of 3Φ Electrodynamometer type power factor meter. (5)

   (b) Explain the operation of saturable core frequency meter in detail. (5)

SECTION - D

7. (a) Explain the term "standardization", of a potentiometer. Describe the procedure of standardization of a d.c potentiometer. (5)

   (b) Explain the effect of secondary burden on the ratio and phase errors of a current transformer. (5)

8. A 100/5 A. 50 Hz current transformer has a bar primary and a rated secondary burden of 12.5VA. The secondary winding has 196 turns and a leakage inductance of 0.96 mH. With a purely resistive burden at rated full load, the magnetization mmf is 16A and the loss excitation requires 12A. Find the ration and phase angle errors. (10)

SECTION - E

9. (a) Mention the basic requirements of measurement.
   (b) Define static and dynamic characteristics of instruments.
   (c) Explain the various standards of measurements.
   (d) How B-H is measured from hysteresis loop?
   (e) State the advantages of PMMC instruments.
   (f) Explain the advantages and disadvantages of Ratio type frequency meter.
   (g) What are the applications of A.C potentiometers?
   (h) What are difficulties for the measurement of high resistance?
   (i) What are the sources of errors in bridge circuits?
   (j) What are uses of instrument transformers? (2×10=20)