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Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech.(EE/Electrical & Electronics/Electronics & Electrical)  
(2011 Onwards)/(Electrical Engineering & Industrial Control)  
(2012 Onwards) (Sem.-3)**

**ELECTRICAL MEASUREMENTS AND INSTRUMENTATION**

**Subject Code : BTEE-303**

**M.Code : 57094**

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 contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

**1 Answer briefly :**

- a. What is the need of standards? Explain.
- b. What do you mean by operating torque? Explain.
- c. What do you mean by the term shielding? Explain its need.
- d. Explain the principle of thermal type instruments.
- e. Write down the different sources of errors in a.c bridges.
- f. Why is it preferable in bridge circuits, that the equation of balance is independent of frequency? Explain.
- g. Why d.c potentiometer cannot be used for a.c measurements straightaway? Explain.
- h. Draw and explain the of BH curve.
- i. Define ratio and phase angle errors in current transformer.
- j. Write down the advantages of an instrument transformer.

**SECTION-B**

2. Describe the construction and working of a co-ordinate type a.c. potentiometer. How is it standardized? Explain.
3. A permanent magnet moving coil (PMMC) instrument has a full scale deflection of  $90^\circ$  for a current of 2 A. The deflecting torque in a PMMC ammeter is directly proportional to current in the moving coil. Find the value of current required for a deflection of  $30^\circ$  if the instrument is :
  - a. Spring controlled
  - b. Gravity controlled.
4. Describe how an unknown capacitance can be measured with the help of DeSauty bridge. What are the limitations of this bridge and how are they overcome by using modified form of DeSauty bridge?
5. What are Permeameters? Explain the working of a Hopkinson Permeameter.
6. Describe the theory and constructional features of potential transformers.

**SECTION-C**

7. Discuss the following :
  - a. Self-balancing potentiometer
  - b. Induction Instruments
8. Explain :
  - a. Resistance Standards
  - b. Flux meter
9. a) A current transformer with 5 primary turns has a secondary burden consisting of a resistance of  $0.16 \Omega$  and an inductive resistance of  $0.12 \Omega$ . When the primary current is 200 A, the magnetizing current is 1.5 A and the iron loss is 0.4 A. Determine the number of secondary turns needed to make the current ratio 100:1 and also the phase angle under these conditions.  
  
b) Describe the working of a low voltage Schering bridge. Derive the equations for capacitance and dissipation factor.

**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.**