Roll No. | | | | | | | | | | | | | 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
Paper ID : [A1136]

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 electrical measurements? Discuss.

b What is controlling torque? Explain.

c What do you mean by systematic errors? Explain.

d List the advantages of thermal type instruments.

e List the applications of AC potentiometer.

f Draw and explain BH curve.

g How instrument transformer is different from ordinary transformer?

h Discuss the conditions for balance of AC bridges.

i What do you mean by power factor? Explain.

j Explain the use of shunts and multipliers.

SECTION-B

2 Describe the construction and characteristics of secondary standards of EMF.

3 A permanent magnet moving coil instrument has the following data: number of turns = 100, width of coil = 20 mm, depth of coil = 30 mm, flux density in the gap = 0.1 Wb/m^2. Calculate the deflecting torque when carrying a current of 10 mA. Also, calculate the deflection if the control spring constant is 2×10^{-6} Nm/degree.

4 Describe the working of a self-balancing potentiometer with the help of a diagram for measurement of temperature using thermocouple.

5 Derive the expression for bridge sensitivity in the case of a voltage sensitive Wheatstone bridge having equal arms start deriving the expression by first assuming that the arms have unequal resistances and finally assumes that the arms have equal resistances.

6 Describe the Lloyd Fisher square for measurement of iron losses in a specimen of laminations. Also list its advantages.

SECTION-C

7 Discuss the following :

a Basic DC Potentiometer circuit

b Maxwell's bridge

8 A current transformer of nominal ratio 1000/5 A, is operating with total secondary impedance 0.4+j0.3Ω. 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 Explain the following :

a Standards of inductance

b Energy meter