

END TERM EXAMINATION

FOURTH SEMESTER [B.TECH.]– MAY-JUNE 2009

Paper Code: ETIC-204/

Subject: Measurement Techniques
(Batch: 2004-2007)

ETIC-204

Measurement & Instruments
(Batch: 2001-2003)

Paper ID: 99204

Time : 3 Hours

Maximum Marks :75

Note: Attempt all questions. Q.No.1 is compulsory. Internal choice is indicated.

- Q.1 (a) Define: Accuracy, Precision and Sensitivity. (3)
- (b) During the measurement of a low resistance using a potentiometer the following readings were obtained:
 Voltage drop across the low resistance under test=0.4221 V.
 Voltage drop across a 0.01 ohm standard resistance=1.0235 V.
 Calculate the value of unknown resistance, current and power lost in it. (3)
- (c) A 220 V dc supply is connected in series with a 120 V, 50 Hz supply. What reading the electro-dynamometer will indicate? (3)
- (d) When a power factor meter is disconnected from a circuit, the pointer remains at the position which is occupied at the instant of disconnection. Discuss, why? (3)
- (e) Explain the advantage of using 'Phantom Load' in meter testing. (4)
- (f) The sinusoidal voltage of equal frequency and magnitude but phase difference of 60° are applied to two pairs of deflecting plates of a CRO. Draw the Lissajous pattern traced on screen. (3)
- (g) Explain with logical reasoning that the Maxwell's inductance -capacitance bridge is used for the measurement of inductance of coils having Q factor as $1 < Q < 10$. (3)
- (h) What is loading effect? (3)

- Q.2 (a) Explain and draw the diagram of coordinate type A.C. Potentiometer. (6.5)
- (b) In a bridge for the measurement of inductance the arm AB consists of unknown impedance with inductance L and R, a known variable resistance in arm BC fixed resistance of 600 ohm each in arm CD and DA, a known variable resistance in arm DE and a capacitor with fixed capacitance of 1 microfarad in the arm CE. The a. c. supply of 100 Hz is connected across A and C and the detector is connected between B and E. If the balance is obtained with a resistance of 400 ohm in the arm DE and a resistance of 800 ohm in the arm BC, calculate the value of unknown R and L. (6.0)

Q3. Explain the construction, principle of operation and working of potential transformer. (12.5)

Q.4 Derive the torque expression of energy meter and explain the significance of lag adjustment and the methods for adjusting the lag. (12.5)

OR

Q.4 Explain the measurement of Volt Ampere and Reactive Volt-ampere. (12.5)

Q5. (a) How can we measure phase difference with the help of CRO. (6.5)

(b) Explain how we get a stationary pattern of waveform in a CRO, while the wave is of very high frequency. (6.0)

OR

Q.5 Write short notes on the following: (12.5)

(a) TVM

(b) Different types of sweeps and their significance.

kk x x x x x x