

Code: EE4T4

II B.Tech - II Semester – Regular Examinations – May 2016

ELECTRICAL MEASUREMENTS & INSTRUMENTATION (ELECTRICAL AND ELECTRONICS ENGINEERING)

Duration: 3 hours

Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11x 2 = 22 M

1)

- a) Accuracy, precision and uncertainty. Explain with examples.
- b) Compare spring control and gravity control systems.
- c) Define transducer.
- d) Why is Schering Bridge particularly suitable for measurement of high voltage?
- e) How the lag adjustment is done in 1- \emptyset induction type energy meter?
- f) Why the scale is non-uniform in MI instruments?
- g) What are the errors in PMMC instruments?
- h) What are the advantages of desauty's bridge?
- i) Why the secondary of a C.T should not be open circuited?
- j) What do you understand by "Burden" in instrument transformer?

k) How do instrument transformers differ from power transformers?

PART – B

Answer any *THREE* questions. All questions carry equal marks.

3 x 16 = 48 M

2)

a) Explain the principle of operation of a permanent magnet moving coil type instrument and derive the expression for torque and deflection angle. 8 M

b) A permanent magnet moving coil voltmeter has 100 turns of enameled Copper wire wound on a square frame which has a length of 2.5 cm and flux density in the air gap is 0.05 Tesla. Calculate the deflection of the coil when it carries a current of 10mA. The control spring provides a torque of 1.2×10^{-6} newton per degree deflection. 8 M

3)

a) Derive the expression for the deflecting torque of an induction type energy meter? 8 M

b) Derive expressions for ratio and phase angle errors of CT.

8 M

4)

a) With neat sketch explain the working principle of a 1- ϕ electro dynamometer type power factor meter. 8 M

b) With neat sketch explain the working of Weston type frequency meter. 8 M

5)

a) Describe working of a low voltage Schering bridge. Derive the equation for capacitance and dissipation factor. Draw the phasor diagram of the bridge under Conditions of balance. 8 M

b) Explain the working of Kelvin's Double Bridge and derive the equation for its balance condition. 8 M

6)

a) Write brief notes on thermocouple and piezoelectric transducers. 8 M

b) Explain in detail about ramp type DVM. 8 M