

Roll No.

EE/EX-303(N)

B. E. (Third Semester) EXAMINATION, Dec., 2010

(New Scheme)

(Common for EE & EX Engg. Branch)

ELECTRICAL INSTRUMENTATION

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt any five questions. All questions carry equal marks.

Unit – I

1. (a) Discuss in detail the types of error in instrumentation system. 10
- (b) Define the following giving suitable examples : 10
 - (i) Accuracy
 - (ii) Precision
 - (iii) Sensitivity
 - (iv) Resolution

Or

2. (a) What are the different effects in producing deflecting torque in an analog instrument ? Give suitable examples. 10
- (b) Discuss the construction and working principle of ballistic galvanometers. 10

Unit – II

3. (a) Explain the construction and working principle of P. M. M. C. ammeter. 10
- (b) Discuss the errors, advantages and disadvantages of P. M. M. C. type of instrument. 10

Or

4. (a) Derive the expression for torque in an electro-dynamo-meter type instruments. 10
- (b) Describe the general requirements for a material to be used for shunts, for ammeters and multipliers for voltmeters. 10

Unit – III

5. (a) Define the following terms as used for instrument transformers : 10
- (i) Transformation ratio
 - (ii) Nominal ratio
 - (iii) Ratio correction factor
 - (iv) Burden
- (b) Draw the equivalent circuit and phasor diagram of a current transformer and discuss ratio and phase angle error. 10

Or

6. (a) Describe the constructional details of an electro-dynamometer type wattmeter. Derive the expression for torque. 10
- (b) A 3-phase 500 V motor load has a power factor of 0.4. Two wattmeters connected to measure the input. They show the total input power to be 30 kW. Find the reading of each instrument. 10

Unit—IV

7. (a) Derive the expression for deflecting torque in a single phase induction type meters. Show that the deflection is maximum when phase angle between the two fluxes is 90° and when the disc is purely inductive. 10
- (b) Explain in detail the working of trivector meter. 10

Or

8. (a) Draw the circuit diagram of a Crompton's potentiometer and explain its working. 10
- (b) Discuss the various applications of A. C. potentiometers. 10

Unit—V

9. (a) Describe the constructional details and working of a single phase electrodynamicometer type of power factor meter. 10
- (b) What are the different methods of measurement of frequency in power frequency range ? Explain any *one* in detail. 10

Or

10. (a) Explain the loss of charge method for measurement of insulation resistance of cables. 10
- (b) Discuss Lloyd Fischer square for measurement of power loss. 10