



Reg. No. :

Name :

Fourth Semester B.Tech. Degree Examination, February 2015
(2008 Scheme)
Branch : Electrical and Electronics
08.404 : ELECTRICAL MEASUREMENTS-I (E)
(Special Supplementary)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions. **Each** question carries **4** marks.



1. Enumerate various sources of errors in instruments.
2. What is accuracy and how it can be specified for an instrument ?
3. Differentiate between deflecting torque and controlling torque in indicating instruments.
4. What is multimeter ? What are the parameters that can be measured with Multimeter ?
5. How the d.c. potentiometer is standardized ?
6. What are the practical difficulties associated with a.c. potentiometers ?
7. What is phantom loading ? Explain why, it is more advantages than testing with direct loading ?
8. Explain Trivector meter.
9. State the advantages of using bridge circuit for the measurements.
10. How the difficulties associated with the measurement of a very high resistance are overcome ? **(10×4 = 40 Marks)**



PART – B

Answer **any one full** question from **each** Module. **Each** question carries **20** marks.

MODULE – I

11. a) The expression for mean torque T of an electro-dynamometer watt meter is written in the form $T \propto M^a E^b Z^c$, where M is mutual inductance between fixed and moving coil, E is applied voltage Z is impedance of coil. Determine values constant a , b and c from dimensional analysis. Take L , M , T and I as fundamental quantities. 10
- b) Describe the construction and working of a PMMC instrument. Derive the equation for deflection if the instrument is spring controlled. 10
12. a) The inductance of a moving iron ammeter with a full scale deflection of 90° at 1.5 A, is given by expression $L = (200 + 40\theta - 4\theta^2 - \theta^3) \mu\text{H}$, where θ is the deflection in radian from the zero position. Estimate angular deflection of pointer for a current of 1.0 A. 10
- b) Explain the working of electrostatic voltmeter. Derive an expression for the torque in terms of relevant quantities. 10

MODULE – II

13. a) A slide wire potentiometer has a battery of 4V and negligible internal resistance. The resistance of slide wire is 100 and its length 200 cm. A standard cell of 1.018 V is used for standardizing the potentiometer and the Rheostat is adjusted so that balance is obtained when the sliding contact is at 101.8 cm. Find the working current of slide wire and the rheostat setting. If the slide wire has division marked in mm and each division can be interpolated to one fifth, calculate the resolution of the instrument. 10
- b) Describe the construction and working of a polar type AC potentiometer. How is it standardized? 10
14. a) Draw the possible methods of connecting the pressure coil of a wattmeter and compare the errors. Explain the meaning of compensating winding in wattmeter. 10
- b) Explain the construction and working of a maximum demand indicator. 10



MODULE – III

15. a) Describe the working of Schering bridge for measurement of capacitance. Derive the equations for balance and draw the phasor diagram under conditions of balance. 10
- b) Explain construction and working of moving coil frequency meter. 10
16. a) What are the different factors which affect the precision measurement of medium resistances with wheat stone bridge ? Explain how their effects are minimized/eliminated. 10
- b) Explain insulation resistance measurement using loss of charge method. 10
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