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Question Paper Code: 33505

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Third Semester

Electronics and Instrumentation Engineering

01UEI305 - ELECTRICAL MEASUREMENTS

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Compare Ballistic and D'Arsonval galvanometer.
2. Write basic principle of rectifier type instrument.
3. What is Phantom loading?
4. What is meant creeping in energy meter?
5. Draw the phasor diagram of PT.
6. Define turn's ratio error in CT.
7. Draw the circuit diagram of megger.
8. What is ground fault?
9. Which are used as detectors in the AC bridges?
10. List the errors in AC bridge methods.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) With neat sketch, explain construction and operation of moving coil instruments. (10)
- (ii) The deflection of a galvanometer is zero with no current and 7mm with a steady state current of $5.6\mu\text{A}$. Its first maximum deflection, after a step function of voltage which produces a steady state current is applied is 112mm . The maximum deflection in the next cycle is 84mm . Determine (1) current sensitivity (2) the logarithmic decrement (3) relative damping. (6)

Or

- (b) Illustrate with a neat diagram the principle of operation, construction and working of PMMC instrument. (16)
12. (a) Explain in detail about sources of errors in Electrodynamometer type wattmeter and also explain the various compensation techniques used. (16)

Or

- (b) Describe basic principle, construction and working of induction type energy meter and also derive the torque equation for the same. (16)
13. (a) (i) Explain in detail about the laboratory grade DC potentiometer. (10)
- (ii) Give the applications of AC potentiometers. (6)

Or

- (b) Explain the operating principle of current transformer with a neat diagram. Mention the various causes of error and state the methods of reducing the errors. (16)
14. (a) Sketch the circuit of Kelvin double bridge, explain its operation and derive the equation for the unknown resistance. (16)

Or

- (b) Each of the arms of a laboratory type Wheatstone bridge has guaranteed accuracy of 0.1% . The ratio arms are both set at 1000 ohm and the bridge is balanced with standard arm adjusted to 3154 ohm . Determine the upper and lower limits of the unknown resistance, based upon the guaranteed accuracies of the known bridge arms. (16)

15. (a) Sketch the circuit diagram of a Maxwell inductance bridge. Derive the equations for resistive and inductive components of the measured inductor. (16)

Or

- (b) (i) Derive an expression for balance condition in Anderson's bridge. (10)
(ii) Derive the bridge balance condition for the Wein's bridge. (6)

