

The galvanometer has a resistance of 100Ω , a sensitivity of $100 \text{ mm}/\mu\text{A}$ and is connected across AC. A source of 4 V dc is connected across BD. Calculate the current through the galvanometer and its deflection if the resistance of arm DA is changed from 400Ω to 401Ω .

- (b) Describe the working of Megohm bridge. 10
9. Explain Anderson bridge in detail with the help of phasor diagram. Also discuss the advantages and disadvantages of Anderson bridge. 20

Roll No.

24027

**B. Tech. 3rd Semester (EE)
Examination – December, 2015**

**ELECTRICAL MEASUREMENTS & MEASURING
INSTRUMENTS**

Paper : EE-209-F

Time : Three Hours]

[Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. 1 is compulsory. Attempt one question from each Unit. All questions carry equal marks.

1. (a) Differentiate between accuracy and precision. 4
- (b) Explain the method of extension of range of measuring instruments as an ammeter. 4
- (c) Explain the causes of error in Electro dynamometer wattmeter. 4
- (d) What are the advantages and disadvantages of owens bridge? 4
- (e) Draw the phasor diagram of owens bridge? 4

UNIT - I

2. (a) Differentiate between scale range and scale span giving suitable examples. 10
- (b) A Wattmeter having a range 1000 W has an error of $\pm 1\%$ of full scale deflection. If the true power is 100 W, what would be the range of readings? Suppose the error is specified as percentage of true value, what would be the range of the readings? 10
3. If we adopt new units of length, mass and time such that one new unit of length = 10 metre, one new unit of mass = 1/10 kilogram and one new unit of time = 100 second. How would the units of force, power, energy and current be affected? The units of permittivity remain the same. 20

UNIT - II

4. Describe the construction and working of PMMC instrument. Derive the equation for deflection if the instrument is spring controlled. Describe the method of damping used in these instruments. 20

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5. Discuss the following types of errors in moving iron type instruments : 20
- (a) Hysteresis error
- (b) temperature error
- (c) Error on account of change of frequency.

UNIT - III

6. In a dynamometer wattmeter the moving coil has 500 turns of mean diameter 30 mm. Estimate the torque if the axes of the field and the moving coils are at (a) 60° (b) 90° when the flux density produced by field coils is $15 \times 10^{-3} \text{ Wb/m}^2$, the current in moving coil is 0.05 A and the power factor is 0.866. 20
7. Explain the construction and working of the following : 20
- (a) Weston type frequency meter
- (b) Ratio type frequency meter

UNIT - IV

8. (a) The four arms of a Wheatstone bridge are as follows : 10
- AB = 100 Ω ; BC = 1000 Ω ; CD = 4000 Ω and DA = 400 Ω

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P. T. O.