

EE/EX-303

B.E. III Semester Examination, December 2014

Electrical Instrumentation

Time : Three Hours

Maximum Marks : 70

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each questions are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.
iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) Name the categories of static errors.
- b) What is difference between absolute error and relative error?
- c) Describe the different methods used for calibration of a ballistic galvanometer.
- d) Describe how the range of a fluxmeter can be increased by shunt. What is the multiplying factor?

OR

Derive the expression for the deflection of Ballistic galvanometer in terms of its physical constants. Explain these constants.

Unit - II

2. a) Why a voltmeter should be of very high resistance?
- b) How an ammeter can be changed into a voltmeter?
- c) Why dynamometer type instruments are not usually used for d.c. measurement?
- d) Draw an illustrative diagram and explain the working of a PMMC type instrument.

OR

A sinusoidal emf of peak value 200 V is applied through a full-wave rectifier to a non-inductive resistant of 10Ω what will be Redding of

- i) A moving-coil ammeter
- ii) A moving-iron ammeter and
- iii) A hot-wire ammeter connected in the circuit

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Unit - III

3. a) What do you understand by ammeter shunt?
- b) What is meant by an instrument transformer?
- c) What is the difference between CT and PT?
- d) What are the advantages of instrument transformer.

OR

A dynamometer type wattmeter with its voltage coil connected across the load side of the instrument read 250 watts. If the load voltage be 200 volts, what power is being taken by load? The voltage coil branch has a resistance of 2000 Ω .

Unit - IV

4. a) What is meant by meter constant of an energy meter?
- b) What is trivector meter?
- c) Describe the construction and working of single phase induction type energy meters.
- d) Draw a connection diagram of crompton potentiometer and bring out its salient features. How is it standardised?

OR

Name the different types of potentiometers and describe one out of them.

Unit - V

5. a) What is a multimeter.
- b) How is measurement of earth resistance carried out?
- c) What are the special problems associated with the measurement of high resistance of the order of mega Ohms.
- d) Describe with the help of neat diagram, the loss of charge method to determine the insulation resistance of a short length of cable and derive an expression for determination of insulation resistance.

OR

Describe the procedure to determine hysteresis loop by the method of reversal. Suggest precautions to be followed.
