EE/EX - 303

B.E. III Semester

Examination, December 2012

Electrical Instrumentation

Time : Three Hours

Maximum Marks : 70/100

Note: 1. *Answer any five questions.*
2. *All questions carry equal marks.*

Unit - I

1. a) Explain the term accuracy, sensitivity, resolution and precision as used for indicating instruments.

   b) Define and explain the loading effect in all type of measuring instruments.   www.rgpvonline.com

Or

1. a) Describe with neat diagram construction and operation of ballistic galvanometer.

   b) What are analog instruments? Discuss various types of damping methods for such instruments.

Unit - II

2. a) Explain the construction and operating principle of MI (moving iron) instruments. List the errors and method of compensation. www.rgpvonline.com

b)   Explain with the help of neat diagram the principle of operation of rectifier type ammeter. Prove that in a rectifier type of voltmeter; the ac sensitivity is 0.45 times the dc sensitivity if a half wave rectifier is used.

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2. a)   Give types of electrostatic voltmeters and explain the construction and working principle of each with neat diagrams.

b)   Explain the use of shunt for extending the range of ammeter. A moving coil-meter gives a full scale deflection with a current of 5mA. If the coil of the instrument has a resistance of 10Ω, show that it can be adopted to work as a voltmeter with a range of 0-100V.

Unit - III

3. a)   Differentiate between a Current Transformer and Potential Transformer. Also explain the ratio and phase angle errors and methods to reduce these errors.

b)   Draw the necessary circuit diagram for measurement of three phase power by two wattmeter method. Make necessary derivations.

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3. a)   Describe briefly the construction of dynamometer type wattmeters and explain various types of errors and their methods of compensation.

b)   A 100/5 A current transformer having a rated burden of 25VA has an iron loss of 0.4 W and a magnetizing current of 2A. Calculate its ratio error and phase angle error while supplying rated output current to a meter having a ratio of,

4. a)   Describe with neat sketch the working of a single phase energy meter. Discuss the friction compensation and creep prevention in an energy meter.

b)   Explain the advantages of using phantom load in meter testing. Explain with the aid of neat diagrams how would you carry out single phase meter testing in he laboratory.

Or

4. a)   Draw the connection diagram of Crompton potentiometer and bring out its salient features. How is it standardized.

b)   A 230V, 50Hz single phase energy meter has a constant of 200 revolutions per kwh. While supplying a non-inductive load of 4.4A at normal voltage. the meter takes 3 minutes for 10 revolutions. Calculate the percentage error of the instrument.

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Unit - V

5. a)   Describe the 'Lloyd Fisher Square' method of measuring the iron loss in magnetic material.

b)   With the help of neat block diagram explain the working of frequency meter.

Or

a)   Explain with the help of neat diagram how you would determine the value of low resistance by Kelvin's double bridge.

b)   Discuss working principle of electro-dynamometer type power factor meter.