Roll No. | | | | | | | | | | |

B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2014

ELECTRICAL AND ELECTRONICS ENGINEERING

III Semester

EE 9203 Measurements & Instrumentation

(Regulation 2008)

Time: 3 Hours | Answer ALL Questions | Max. Marks 100

PART- A (10 x 2 = 20 Marks)

1. Distinguish between accuracy and precision
2. What are the types of error?
3. Give the characteristics of transducer.
4. List the methods of calibration of strain gauges.
5. A current transformer has a rating of 1000/5 A. It's magnetizing and loss components of the exciting current are 1A and 0.6A respectively, and secondary winding burden is purely resistive. Calculate the transformation ratio at rated current?
6. Discuss the advantages of electrodynamometer type instrument.
7. Write the methods for measurement of high resistance.
8. Differentiate Hay's bridge and De Sauty's bridge.
9. Distinguish between absolute and relative humidity.
10. List the advantages and disadvantages of electromagnetic flow meters.

Part – B (5 x 16 = 80 marks)

11. i) 0-150 V voltmeter reads 90V find the percentage limiting error if the instrument has the limiting error of 1%. Find the limiting error if the meter reads 70V.How probable error of one reading is calculated?

ii. A set of readings obtained in an experiment is

Temperature c	497	498	399	400	401	402	403	404	405
Frequency of occurrence	1	3	12	23	37	16	4	2	2

Determine : Arithmetic mean, mean deviation, standard deviation and variance.

12. a. Write a note on i) Variable permeability inductive transducer. (ii) Variable reluctance inductive transducer (iii) Eddy current type inductive transducer.

(OR)

b. i. Explain the basic principle of ADC
ii. List the drawbacks of binary weighted resistor technique of D/A conversion.

13. a.i. Describe the constructional details and working of an electrodynamometer type instrument. Derive the equation for deflection under a.c operation if the meter is spring controlled.

ii. A rectifier type of instrument uses a basic PMMC movement of 50 μA and a resistance of 1000Ω.It employs a full wave rectifier circuit with forward resistance of each diode being 1000 Ω. The reverse resistance of the diodes is infinite. The range of the instrument is 0-10v a.c sinusoidal. Calculate the value of series multiplier and meter sensitivity.

(OR)

b. Explain the special features incorporated in an electrodynamometer type of wattmeter so that it can be used for low power factor applications.

14. a.i. Draw the circuit of a wheat stone bridge and derive the conditions of balance.

ii. Draw the circuit of a Kelvin's double bridge used for measurement of low resistances. Derive the conditions for balance.

(OR)

b. Derive the equations of balance for an Anderson's bridge. Draw the phasor diagram for conditions under balance. Discuss the advantages and disadvantages of the bridge.

15. a. Explain the working principle of Total radiation pyrometers and Optical pyrometers.

(OR)

b. Describe the construction and working and theory of an electromagnetic type flow meter. Compare the operations of their meter when it is excited by (i) DC and (ii) AC.

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