Total No. of Questions : 10] [Total No. of Printed Pages : 3

Roll No. .....

EC–303(N)

B. E. (Third Semester) EXAMINATION, Feb., 2010

(New Scheme)

(Electronics & Communication Engg. Branch)

ELECTRONIC INSTRUMENTATION

[EC – 303(N)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt *one* question from each Unit. All questions carry equal marks.

Unit – I

1. (a) A voltmeter, having a sensitivity of 1000 Ω/V, reads 40 V on its 150 V scale when connected across an unknown resistor in series with a multimeter ? When the milliammeter reads 800 mA, calculate : 8

   (i) The apparent resistance of the unknown resistor.

   (ii) The actual resistance of the unknown resistor.

   (iii) The error due to the loading effect of the voltmeter.

   (b) Define the following : 12

   (i) Accuracy

   (ii) Precision

   (iii) Sensitivity

P. T. O.

(iv) Linearity

(v) Resolution

(vi) Hysteresis

Or

2. (a) Describe the working principle of chopper type D. C. voltmeter. What are the advantages and disadvantages of chopper type D. C. voltmeter over basic D. C. voltmeter ? 10

(b) What are the methods of power measurement ? Describe any *one* method in detail. 10

Unit – II

3. (a) Derive the expression of deflection of beam in CRO. Also define the deflection sensitivity and deflection *factor.* 15

(b) What are the advantages of using an active voltage probe ? 5

Or

4. (a) What are the differences between dual trace and dual beam oscilloscope ? 10

(b) Explain the function of time base generator in a CRO. 5

(c) What is delayed sweep ? When is it used ? 5

Unit – III

5. (a) Which bridge is used for measurement of high voltage and relative permittivity ? Describe the working principle of that bridge. 10

(b) Why the Wagner earth detector (WED) is required in bridge ? Describe the principle of WED in brief. 10

Or

6. (a) A bridge is balanced at 1000 Hz and has the following constants : 10

AB, $0 \cdot 2 \mu$ F pure capacitance; BC, 500 Ω pure resistance; CD, unknown; DA, R = 300 Ω in parallel with C = $0 \cdot 1 \mu$ F. Find the R and C or L constant of arm CD, considered as a series circuit.

(b) Describe the working principle of piezoelectric transducer. 10

Unit – IV

7. (a) What are the applications of spectrum analyser ? 10

(b) Draw the block diagram of function generator and explain the working of it. 10

Or

8. (a) Describe the frequency selective and heterodyne wave analyzer and compare them. 15

(b) Explain the working principle of beat frequency oscillator. 5

Unit – V

9. (a) What are the advantages and disadvantages of digital instruments over analog instrument ? 5

(b) Define the resolution and sensitivity of digital voltmeter. 5

(c) Explain the principle of operation of PLC. 10

Or

10. (a) What is the principle of operation of successive approximation method ? Draw the simplified block diagram of successive approximation method and explain it. 12

(b) Draw the block diagram of practical digital to analog converter and explain it. 8