(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0323 Roll No. | | | | | | | | | | |

B.Tech.

(SEMESTER-IV) THEORY EXAMINATION 2012-13

ELECTRONIC INSTRUMENTATION AND MEASUREMENTS

Time : 3 Hours] *[Total Marks : 100*

SECTION – A

1. Attempt **all** questions : **10 × 2 = 20**

(a) What do you understand by static characteristics ?

(b) How is accuracy expressed ?

(c) How can a basic ammeter be converted into a multi range ammeter ?

(d) What is the criteria for balance of a Wheatstone bridge ?

(e) Define the term null as applied to bridge measurement.

(f) State the standard specifications of a simple CRO.

(g) State the need of a time base generator in CRO.

(h) Define a plotter.

(i) State the purpose of error detector in a recorder.

(j) Differentiate between plotter and recorder.

SECTION – B

2. Answer any **three** : **3 × 10 = 30**

(a) A voltmeter reading 70 V on its 100 V range and an ammeter reading 80 mA on its 150 mA range are used to determine the power dissipated in a resistor. Both these instruments are guaranteed to be accurate within ±1.5% at full scale deflection. Determine the limiting error of the power.

(b) Draw and explain the construction of PMMC movement.

(c) A moving coil instrument gives a full scale deflection of 20 mA when the potential across its terminals is 100 mV. Calculate :

(a) Shunt resistance for a full scale deflection corresponding to 50 A.

(b) The series resistance for a full scale reading with 500 V. Also calculate power dissipation in each case.

(d) Draw the basic block diagram of an oscilloscope and state the function of each block.

(e) Explain with diagram the working of an Anderson bridge.

SECTION – C

Answer the following questions : **5 × 10 = 50**

3. A capacitor is tested by a Schering bridge which forms one arm AB of the bridge. The other arms are

AD-a non inductive resistance of 100 Ω.

DC-a non reactive resistance of 300 Ω in parallel with a capacitor of 0.5 μF.

BC-a standard loss free capacitor off 100 pF.

The supply frequency is 50 Hz.The bridge is balanced.

Calculate the capacitor value and the power factor of the capacitor under test.

OR

The arms of a Maxwell's bridge are arranged as follows :

AB and BC are non reactive resistors of 100 Ω each. DA a standard variable reactor of resistance 32.7 Ω and CD consist of a standard variable resistor in series with the coil of unknown impedance Z, balance was found with L=150 mH and Z=1.36 R. Find R and L of the coil.

4. Draw the basic circuit of a staircase waveform generator and explain its operation.

OR

Sketch circuits to show how a.c voltmeters and ammeters should be calibrated using standard instruments. Explain.

5. Compare the performance of light beam and pen type galvanometric strip chart recorders.

OR

Derive equations for converting a series RC circuit into its equivalent parallel circuit.

6. Describe with the help of a block diagram the operation of a X-Y recorder. Also list the application of X-Y recorder.

OR

Explain the working principle of a digital X-Y plotter.

7. Describe with block diagram the operation of a digital storage CRO. State the function of each block.

OR

Explain with diagram how CRO can be used to check diodes, inductors and capacitors.
