15-6-15 (M)

COMP – 4-4 (RC)

S.E. (Comp.) (Semester – IV) (RC) Examination, May/June 2015
ELECTRONIC MEASUREMENT

Duration : 3 Hours | Total Marks : 100

Instructions : *i) Answer **any five** questions, selecting atleast **one** question from **each** Module.*
*ii) **Assume** suitable data **wherever** required.*

MODULE – I

1. a) With respect to electronic measurement, define the following terms : 3
   i) Accuracy ii) Error iii) Resolution
   b) A set of independent voltage measurements taken by four observers was recorded as 117.02 V, 117.11 V, 117.08 V and 117.03 V. 6
   Calculate :
   i) the average voltage ii) the range of error.
   c) What are systematic errors ? Classify them. Briefly describe each of the error. 6
   d) With respect to system of units, briefly describe various basic SI units. 5

2. a) Write a short note on : 5
   (1) Electrical standard – The Absolute Ampere.
   b) Explain briefly about permanent magnet moving coil mechanism. 5
   c) Explain operating and performance characteristics of digital voltmeter. 5
   d) With neat diagram, explain basic Q-meter circuit. Define the condition at resonance, for the circuit. 5

MODULE – II

3. a) With neat diagram, explain the internal structure of a cathode ray tube. 6
   b) What is the function of the vertical delay line ? With neat diagram, explain the effect. 7
   c) With neat diagram, explain the working of a digital storage oscilloscope. 7

P.T.O.

4. a) Explain the working of a Hartley oscillator. 6

   b) Describe the following terminologies user w.r.t. pulse characteristics : 7

      i) Rise time ii) Fall time

      iii) Droop iv) Amplitude

      v) Pulse repetition rate

   c) With neat diagram, explain audio-frequency signal generator. 7

MODULE – III

5. a) Explain Heterodyning wave analyzer. Draw a neat diagram. 6

   b) What do you understand by Harmonic distortion ? Explain in brief. 4

   c) With neat diagram, explain General-purpose spectrum analyzer. 5

   d) Give some applications of the spectrum analyzer. 5

6. a) What do you understand by frequency counter ? Briefly explain. 5

   b) Give comparison between synchronous counters and asynchronous counters. What do you mean by cascading of counters ? 6

   c) With respect to electronic counters, explain : 4

      i) Gating error ii) Trigger level error

   d) What are the different means of extending the frequency range of the counter ? Briefly explain. 5

MODULE – IV

7. a) Derive an equation for a gage factor of a strain gage as : 7

   $K = 1 + 2\mu$

   b) Briefly explain the working of a Linear Variable Differential Transformer (LVDT). 5

   c) Write a short note on : 8

      i) Photo voltaic cells ii) Photo conductive cells

8. a) Briefly describe different elements of digital data acquisition system. 6

   b) Draw a neat diagram of an instrumentation amplifier and state some of its characteristics. 6

   c) Write a short note on : 8

      Analog-to-Digital Multiplexing.