COMP 4 – 4 (RC)

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

Duration : 3 Hours Total Marks : 100

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

MODULE – I

1. a) With respect to electronic measurements, define the following terms : **3**
   i) Error
   ii) Accuracy
   iii) Sensitivity.
   b) A set of independent voltage measurements taken by four observers was recorded as 117.03 V, 117.10 V, 117.08 V and 117.01 V. Calculate : **6**
   i) The average voltage.
   ii) The range of error.
   c) What are random errors ? Briefly explain how are they different from other kinds of error ? **6**
   d) Briefly explain about basic SI units. What are derived units ? **5**
2. a) Write a short note on : IEEE standards. **3**
   b) Briefly explain permanent magnet moving coil mechanism. **5**
   c) Explain Ramp – type digital voltmeter. Draw necessary diagram and waveforms. **6**
   d) Draw a neat diagram of a Q-meter circuit for measurement of low-impedance component in the series connection. How unknown impedance of purely resistive type can be measured and calculated ? Derive the necessary equation. **6**

MODULE – II

3. a) With respect to cathode ray tube, explain the following : **7**
   i) Deflection of the cathode ray beam
   ii) Post deflection acceleration
   iii) Screens for CRTs.
   b) What are basic types of delay line ? Explain them in brief. **6**
   c) With neat block diagram, explain digital storage oscilloscope. **7**

P.T.O.

4. a) What is the principle of operation used in signal generation ? Briefly explain. 5
   b) Draw a neat diagram of a astable multivibrator and explain its working. 6
   c) Explain the basic elements used in a function generator. Describe the same, with a neat block diagram. 6
   d) State different characteristics of audio frequency signal generator. 3

MODULE – III

5. a) Explain with neat diagram, audio-range wave analyzer. Draw the characteristic of the filter used. 7
   b) Explain with neat functional block diagram, tuned – circuit harmonic analyzer. 6
   c) With neat diagram, explain the working of fast fourier transform spectrum analyzer. 7
6. a) Draw a block diagram of a simple frequency counter and explain its working. 5
   b) With respect to Frequency counters, explain : 5
      i) Ripple counter.
      ii) Binary synchronous counter.
   c) Explain different measurement errors occurring in electronic counter. 5
   d) Give different methods of extending the frequency range of the counter. Briefly explain each of the method. 5

MODULE – IV

7. a) Derive an equation for a gage factor of a strain gage is : $K = 1 + 2\mu$. 7
   b) Briefly explain about : 6
      i) Resistance thermometers.
      ii) Thermocouples.
   c) With neat diagram, explain the working of a photocell control circuit. 7
8. a) What are the different types of data-acquisition system ? Briefly explain. 8
   b) With the help of neat diagram, explain instrumentation amplifier. 6
   c) Explain different types of multiplexing schemes. 6
