S.E. (Comp.) (Semester – III) (RC) Examination, Nov./Dec. 2014
INTEGRATED ELECTRONICS

Duration : 3 Hours   Total Marks : 100

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

MODULE – I

1. a) Describe different open-loop configurations of an Op-amp.   8

   b) Derive an equation for the input resistance of an OPAMP with feedback in
      a voltage-series feedback amplifier configuration.   6

   c) Give comparison between :
      Integrator circuit and differentiator circuit built using OPAMP.   6

2. a) Derive an equation for the V_{ab} i.e. voltage across the output terminals of
      the transducer bridge, for the differential instrumentation amplifier. (Assume
      the use of "resistive transducer" in a bridge).   8

   b) Write a short note on :   6
      Zero crossing detector using OPAMP.

   c) i) The frequency response of IC 741 C is shown below :   3
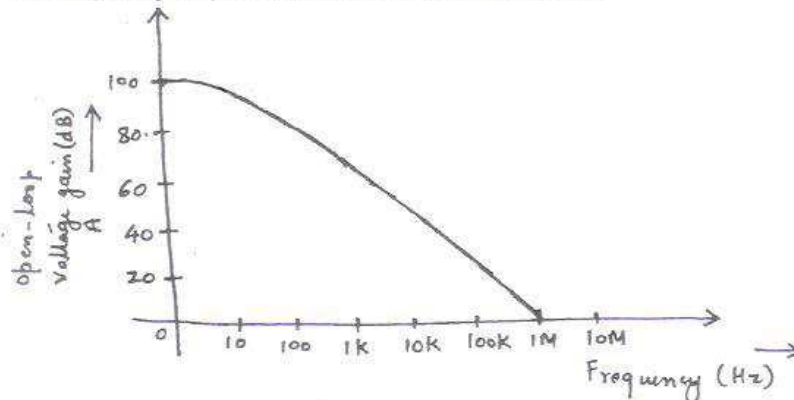
      Determine the voltage gain that can be used to have a maximally flat
      response at 1 KHz.

      ii) The output voltage of a certain OPAMP circuit change by 20 V in 4 μs.
          What is its slew rate ?   3

MODULE – II

3. a) List various characteristic of a voltage regulator IC LM105. 6

   b) With a neat functional diagram, explain the timer IC555. 7

   c) Explain with neat diagram, phase-locked loop. 7

4. a) Differentiate between : 6

   High voltage regulator using IC723 V/s Low voltage regulator using IC723.

   b) Design an astable multivibrator as a square wave oscillator. Draw the neat circuit diagram, equations derived and output waveform. 8

   c) Describe the following application of PLL : 6
   i) FM detector.

MODULE – III

5. a) What are logic families ? Describe its different types. 6

   b) Explain the working of a RTL gate. Draw necessary diagram. 6

   c) i) State and explain any two characteristics of digital IC. 4

   ii) Explain the working of a CMOS Inverter. 4

6. a) Explain the working of a DTL gate. Draw necessary diagram. How is it different from a modified DTL gate ? Explain. 8

   b) Draw a neat diagram of a ECL gate and explain its working. 7

   c) State some advantages and disadvantages of a TTL gate. 5

MODULE – IV

7. a) Explain giving examples where A/D and D/A converters are used. 6

   b) Describe A/D converter using Voltage-to-Frequency conversion. What is the use of monostable multivibrator circuit in it ? 8

c) Briefly explain the following specifications for D/A converter :   6

    i) Resolution

    ii) Linearity

    iii) Accuracy

    iv) Settling time.

8. a) Differentiator between weighted-resistor D/A converter and R-2R Ladder D/A converter.

                                                            6

   b) Describe Dual-slope A/D converter. Carry out the analysis for the output of the counter w.r.t. its working functionality.

                                                            8

   c) Explain some specifications of A/D converter.

                                                            6