Total No. of Questions—8]   [Total No. of Printed Pages—3

S.E. (Electronics/Electronics & Telecommunication)

(Second Semester) EXAMINATION, 2016

INTEGRATED CIRCUITS

(2012 PATTERN)

Time : Two Hours   Maximum Marks : 50

N.B. :— (*i*) Answer Q. No. **1** *or* Q. No. **2**, Q. No. **3** *or* Q. No. **4**, Q. No. **5** *or* Q. No. **6**, Q. No. **7** *or* Q. No. **8**.

(*ii*) Neat diagrams must be drawn wherever necessary.

(*iii*) Figures to the right indicate full marks.

(*iv*) Use of electronic pocket calculator is allowed.

(*v*) Assume suitable data, if necessary.

1. (*a*) What is the need of frequency compensation ? Explain dominant pole method of external frequency compensation.   [6]

   (*b*) With neat diagram explain the necessity and working of current mirror circuit.   [6]

P.T.O.

Or

2. (*a*) The following specifications are given for dual input balance output difference amplifier :

R_c = 2.2 kΩ, R_E = 4.7 kΩ, $R_{in}1$ = $R_{in}2$ = 50 Ω, $+V_{CC}$ = 12 V, $-V_{EE}$ = -12 V, β_{ac} = β_{dc} = 100, V_{BE} = 0.715 V.

Determine :

(*i*) Operating point i.e. I_{CQ} and V_{CEQ}

(*ii*) Input and output resistance. [6]

(*b*) What are the different types of noise those are associated with op-amps ? Draw op-amp noise model and give expression for output noise voltage. [6]

3. (*a*) Explain practical integrator circuit with neat circuit diagram. What are the limitations of ideal integrator ? [6]

(*b*) Draw and explain sample and hold circuit using Op-amp. [6]

Or

4. (*a*) Draw and explain half wave precision rectifier circuit. [6]

(*b*) Explain the working of inverting Schmitt trigger. Also derive the equations for the trigger points. [6]

5. (*a*) Explain F2V converter with appropriate waveforms. [7]

(*b*) Explain binary weighted resistor type of DAC. [6]

Or

6. (*a*) With the help of neat diagram explain the operation of flash type ADC. [7]

(*b*) Calculate output voltage of 8 bit DAC for digital input 10000000 and 11011101 with reference voltage of 10 V. [6]

7. (*a*) Explain operation of PLL with the help of neat block diagram. Define the terms lock range and capture range. [7]

(*b*) Write a short note on fixed and variable voltage regulators. [6]

Or

8. (*a*) Draw and explain circuit of FM demodulator using PLL. [7]

(*b*) Explain low drop out voltage regulator. [6]