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[5057]-246

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 :

$$R_c = 2.2 \text{ k}\Omega, R_E = 4.7 \text{ k}\Omega, R_{in 1} = R_{in 2} = 50 \text{ }\Omega, +V_{CC} = 12 \text{ V}, -V_{EE} = -12 \text{ V}, \beta_{ac} = \beta_{dc} = 100, V_{BE} = 0.715 \text{ V}.$$

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]