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[4957]-1046

S.E. (Electronics/Electronics and Telecommunication)

(II 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 are the different types of noise those are associated with opamps ? Draw opamp noise model and give expression for output noise voltage. [6]
- (b) With neat diagram explain the necessity and working of current mirror circuit. [6]

Or

2. (a) Following specifications are given for dual input balance output difference amplifier : [6]

P.T.O.

$R_C = 2.2 \text{ K}\Omega$, $R_E = 4.7 \text{ K}\Omega$, $R_{in1} = R_{in2} = 50 \text{ }\Omega$, $+ V_{CC} = 10 \text{ V}$, $- V_{EE} = -10 \text{ V}$, $\beta_{ac} = \beta_{dc} = 100$, $V_{BE} = 0.715 \text{ V}$.

Determine :

- (i) Operating point i.e. I_{CQ} and V_{CEQ}
 - (ii) Input and output resistance.
- (b) What is the need of frequency compensation ? Explain any *one* method of external frequency compensation. [6]
- 3.** (a) Explain practical differentiator circuit with neat circuit diagram. What are the limitations of ideal differentiator ? [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 V2F 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 Dual Slope 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) With the help of neat block diagram explain operation of PLL. 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]