No. of Printed Pages : 3

BIEL-002

00381

B.TECH. IN ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

Term-End Examination

June, 2013

BIEL-002 : ANALOG INTEGRATED CIRCUITS DESIGN

Time : 3 hours *Maximum Marks : 70*

*Note : (i) Attempt **any seven** questions.*
*(ii) Use of scientific calculator is **permitted**.*

1. (a) What should be the Ideal Char of an OP-AMP ? Distinguish between virtual ground and actual ground. 5

   (b) Explain the meaning of bias offset and drift voltage for an OP - AMP. 5

2. (a) Derive the expression for CMRR of an OP-AMP. 4

   (b) Find the output voltage (V_0) for circuit given in figure (1) 6

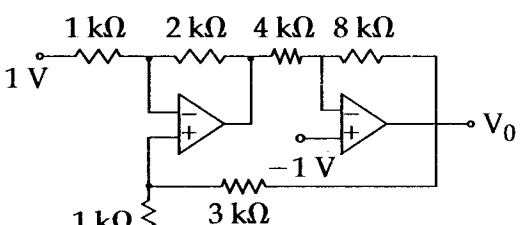

Figure (1)

3. (a) Explain how an OP - AMP can be used as a differentiator. 5

(b) Explain how square and triangular waveforms can be produced using OP-AMP. 5

4. (a) Draw the circuit diagram of a sample and hold circuit using OP - AMP IC 741. Explain its operation. 6

(b) What are the power supply considerations of OP - AMP ? 4

5. (a) Construct a monostable multivibrator using 555 timer and explain its operation. 5

(b) Explain with block diagram how a PLL can be used as a frequency multiplier. 5

6. (a) Design a first - order HP Butter worth filter with cut - off frequency of 100 Hz and high frequency gain of 10. 5

(b) Show that normalized gain of an n^{th} order Butterworth LP filter rolls off at a rate of 20 ndB/decade for away beyond cut off. 5

7. (a) Draw the circuit diagram of V to F converter and explain its operation. 5

(b) Explain how OP-AMP is used as saw - tooth wave generator. 5

8. (a) Design a notch filter with center frequency, $f_o = 400Hz$, center frequency gain, $A_0 = 2$ and $Q = 10$. 5

(b) Draw the block diagram of PLL IC 565 and explain function of each block. 5

9. (a) Explain the following terms for PLL : 6

(i) Free running frequency

(ii) Lock range

(b) What is a VCO ? What is the role served by the VCO in a PLL Chip ? 4

10. Attempt ***any two*** of the followings : 2x5=10

(a) Schmitt Trigger

(b) Peak detector

(c) Instrumentation Amplifier