No. of Printed Pages : 3 **BIEL-002**

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

Term-End Examination

December, 2013

BIEL-002 : ANALOG INTEGRATED CIRCUITS DESIGN

Time : 3 hours *Maximum Marks : 70*

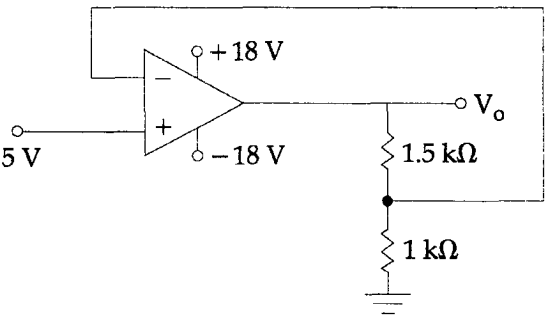
Note : *(i) Attempt any seven questions.*
(ii) Use of scientific calculator is permitted.

1. (a) Draw the circuit diagram of an inverting amplifier using an OP-AMP. "A virtual ground exists at the input of the amplifier". Explain. 6

   (b) Derive the formula for voltage gain of an inverting amplifier. 4

2. (a) Draw the circuit diagram of a difference amplifier using OP-AMP and find an expression for the output voltage. 4

   (b) Determine Vo of following Circuit. 6



3. (a) Explain how you can construct using an OP-AMP and other components. 6
   (i) A peak detector
   (ii) A half-wave rectifier
   (b) Explain how square and triangular wave forms can be produced using OP-AMP. 4

4. (a) Draw the circuit of current to voltage converter using OP-AMP. 4
   (b) What is a precision rectifier ? Why in a precision rectifier circuit an OP-AMP is connected before a diode ? 6

5. (a) Explain the operation of a zero-crossing detector. 5
   (b) Explain the features of an VCO. 5

6. (a) Explain the functional diagram of 555 times. 5
   (b) Explain an Astable multivibrator using 555 timer. 5

7. (a) Discuss how FM detection can be achieved using a PLL. 5
   (b) Define the lock range and capture range of a PLL. 5

8. (a) Design a second-orders low pass active filter required to have a cut-off frequency of 5kHz. 6
   (b) What is a state variable filter ? Explain its operation. 4

9. (a) Design a butlerworth LP filter which has a cut-off frequency of 1 kHz. The gain is required to drop at least-56 db at 10 kHz. **6**

(b) Draw the circuit diagram of frequency to voltage converter avel explain its operation. **4**

10. Attempt ***any two*** of following : **2x5=10**

(a) Log/antilog amplifier

(b) PLL-frequency synthesizer

(c) Schmitt trigger.