

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

Term-End Examination

December, 2012

**BIEL-002 : ANALOG INTEGRATED CIRCUITS
DESIGN**

Time : 3 hours

Maximum Marks : 70

- Note :** (i) *Attempt any seven questions.*
(ii) *All questions have equal marks.*
(iii) *All the questions are to be answered in English language only.*
(iv) *Use of scientific calculator is allowed.*

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1. (a) What do you mean by complementary emitter follower circuit employed in output stage ? Discuss it. 5
- (b) Draw the circuit diagram of differential amplifier with Active Load. Explain it. 5
2. (a) Design a widlar current source to give $I_{out} = 6\mu A$, and $I_{Ref} = 1.2mA$. Given $V_{BE} = 0.7 V$, $V_T = 26m V$, $V_{CC} = 20 V$ and $\beta = 120$. 5
- (b) What is the need of DC level shifter in an op-Amp ? Draw the circuit diagram for DC level shifter and explain its operation. 5

3. (a) Draw the circuit diagram of current to voltage converter and explain how current is converted to voltage. 5
- (b) For the circuit shown in figure 1, show that $V_{out} = 4(V_2 - V_1)$ 5

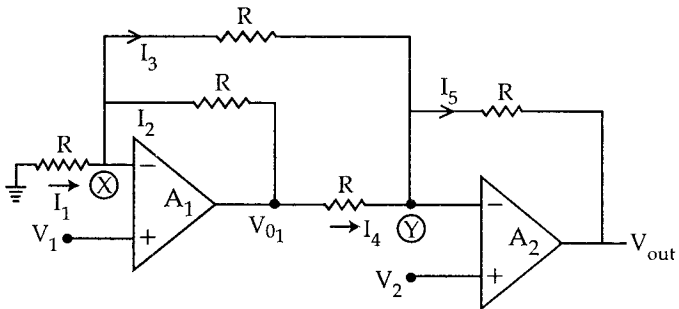
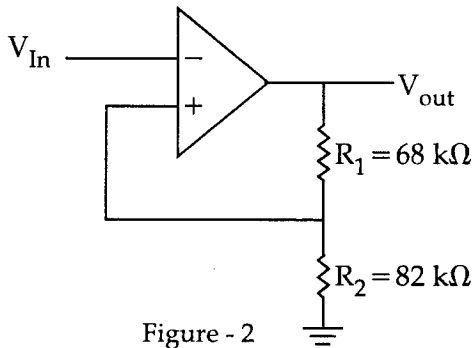


Figure - 1

4. (a) Draw the circuit diagram of Ideal and Practical differentiators and explain the difference between the two circuits. 5
- (b) What is clamper ? Draw the circuit of clamper using op-Amp and explain its operation with a neat sketch. 5
5. (a) Explain the operation of Sample and Hold circuit with a neat sketch. 5

- (b) Compute the upper threshold voltage, lower threshold voltage and Hysteresis Voltage of the circuit shown in figure 2. Assume $\pm V_{\text{sat}} = \pm 7\text{V}$. 5



6. (a) What do you mean by Precision Rectifier ? Explain the circuit of Precision Full - Wave Rectifier with a neat diagram. 5
- (b) Draw the circuit diagram of peak detector and explain its operation with neat sketch. 5
7. (a) What is Monostable Multivibrator ? Draw the circuit diagram and explain its operation with the help of waveforms. 5
- (b) Draw the circuit of Anti Log-Amplifier and show how the circuit compensates the effect of temperature. 5

8. (a) Design a first order low pass filter with the following specifications : 5
cut-off frequency = 3 kHz. Pass band gain = 2.
- (b) With the help of circuit diagram explain the operation of a triangular wave generator. 5
9. (a) Draw the block-diagram of PLL and explain the function of each block in detail. 5
- (b) Draw and explain the working of PLL synthesizer. 5
10. Write short notes (*any two*) : 5+5
- (a) Instrumentation Amplifier
 - (b) FSK demodulator
 - (c) Monolithic Timers
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