

**B.Tech. – VIEP – ELECTRONICS AND  
COMMUNICATION ENGINEERING  
(BTECVI)**

00296

**Term-End Examination**

**June, 2016**

**BIEL-011 : LINEAR INTEGRATED CIRCUITS**

*Time : 3 hours*

*Maximum Marks : 70*

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*Note : Attempt any seven questions. All questions carry equal marks. Use of scientific calculator is permitted. Missing data if any, may be suitably assumed.*

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1. Give the circuit diagram of a BJT based Wilson current source and derive an expression for its output current and output resistance.  $3+4+3=10$
2. What is the function of a level-translator circuit ? Draw the circuit diagram of any level-translator circuit and explain its operation with the help of necessary mathematical steps.  $3+7=10$

3. Derive an expression for the total output offset voltage of an op-amp. Also, explain the effect of temperature on it. *5+5=10*
4. Define the following terms :  
Input offset voltage, Input bias current, Input offset current, SVRR and CMRR. *5×2=10*
5. Define the term Slew rate. What are the causes of Slew rate in op-amp ? Also, explain its effect on any one application. *3+4+3=10*
6. Draw the circuit diagram of a temperature compensated logarithmic amplifier and derive an expression for its output voltage. *10*
7. Give the circuit diagram of a current-to-voltage converter with grounded as well as floating load. Also, derive the expression for output in both cases. *10*
8. Give the circuit diagram of an RC phase-shift oscillator and derive an expression for the frequency and condition of oscillation. *10*

9. Draw the circuit diagram of a non-inverting comparator circuit using an op-amp. Explain its operation and give the input-output waveforms and its transfer characteristic curve. 10

10. Write short notes on any *two* of the following : 2×5=10

- (a) Zero-crossing detector
  - (b) Triangular-wave generator
  - (c) Constant-current bias circuit
  - (d) Barkhausen criterion of oscillation
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