

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

Term-End Examination

December, 2015

**BIEL-012 : ANALOG AND MIXED MODE VLSI
DESIGN**

Time : 3 hours

Maximum Marks : 70

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

1. What is the function of a sample-and-hold circuit? With the help of a neatly labelled diagram explain the operation of any one example of sample-and-hold circuit. 3+7=10
2. What are the advantages and disadvantages of digital discrete-time signals over analog signals? 10
3. Give the circuit diagram of a R-2R Digital-to-Analog Converter (DAC). Derive the expression for the o/p voltage, if the i/p is a 4-bit binary number of the form $b_3b_2b_1b_0$. 4+6=10

4. Explain the operation of successive approximation Analog-to-Digital Converter (ADC), with the help of a neatly labelled block diagram. 10
5. Explain the operation of a basic CMOS comparator circuit. 10
6. What are the design steps for resistors in sub-micron CMOS technology? 10
7. Explain the operation of a MOSFET in linear and saturation region. How can a MOSFET be used as a Voltage-Variable Resistor (VVR)? 6+4=10
8. What are the various design parameters of an op-amp? Explain each parameter briefly. 10
9. Discuss in brief the issues related to Mixed-Signal Layout. 10
10. Write short notes on any *two* of the following : 2×5=10
 - (a) High-Pass Sync Filters
 - (b) Analog Multipliers
 - (c) Process Flow