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BIEL-012

00369

B.Tech in Electronics and Communication Engineering (BTECVI)

Term-End Examination

December, 2011

BIEL-012 : ANALOG AND MIXED MODE VLSI DESIGN

Time : 3 hours *Maximum Marks : 70*

Note : *(i) Attempt **any seven** questions. Each carries **10** marks.*
*(ii) Use of **scientific** calculator is permitted.*

1. Explain the role of Analog-to-Digital converters. Also discuss the methods to convert analog signals to Digital signals. **10**

2. Discuss in detail Sample and Hold (S/H) characteristics. **10**

3. Discuss the various mixed signal layout issues. **10**

4. With neat sketch explain successive approximation ADC. **10**

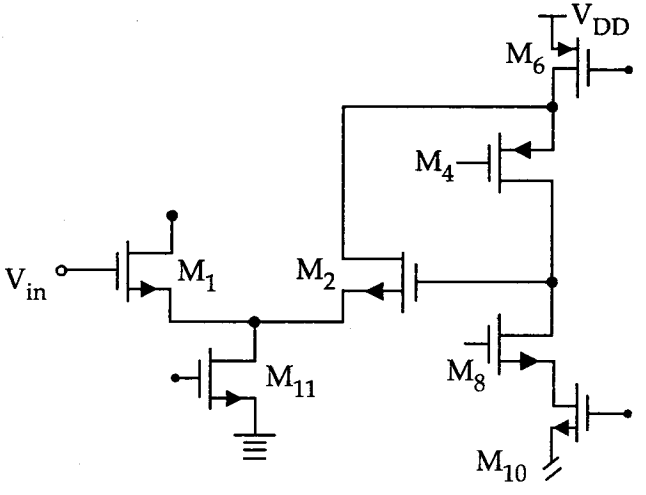
5. Design a 3 - bit DAC using a R-2R architecture with $R = 1\ k\Omega$, $R_f = 2k\Omega$ and $V_{Ref} = 5V$. Assume that the resistances of the switches are negligible. **10**

6. Explain the basic CMOS comparator design in detail. **10**

7. What is a MOSFET switch ? Explain briefly the two non-ideal effects associated with these switches. **10**

8. Discuss the performance parameters of an Op-Amp. **10**

9. Design a folded cascode Op-amp with an NMOS input pair to satisfy the following specifications : $V_{DD} = 3V$, differential output swing = 3V, power dissipation = 10mW, Voltage gain = 2000. Assume $\mu ncox = 60\mu A/V^2$, $\mu pcox = 30\mu A/V^2$, $\lambda_n = 0.1\ V^{-1}$, $V_p = 0.2\ V^{-1}$ (for an effective channel length of $0.5\mu m$), $r = 0$, $V_{THN} = |V_{THP}| = 0.7$ V. **10**



10. Write short notes on *any two* : **2x5=10**
    (a) Level shifting
    (b) Pipeline ADC
    (c) Interpolating filters for DAC