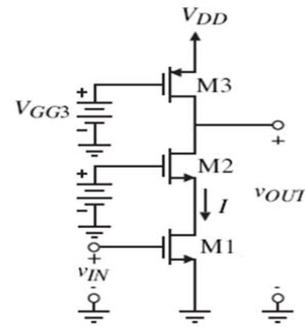


GUJARAT TECHNOLOGICAL UNIVERSITY**M.E –IIst SEMESTER–EXAMINATION – JULY- 2012****Subject code: 1724205****Date: 127/2012****Subject Name: Analog and Mixed Signal VLSI Design****Time: 10:30 am – 13:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain Diode Reference Self Biasing. 07
 (b) Explain the significance of class AB CMOS amplifier. 07

- Q.2** (a) Explain Miller Compensation. 07
 (b) The Specification of cascade amplifier are 07
 $A_v = -50$ V/V, $V_{out(max)} = 4$ V and $V_{out(min)} = 1.5$ V, $V_{DD} = 5$ V, and $P_{diss} = 1$ mW. The slew rate with a 10pF load should be 10V/ μ s or greater. Design a cascade amplifier with above specification. $V_{tn} = 0.7$ V, $V_{tp} = -0.7$ V, $k_n' = 110 \mu\text{A}/\text{V}^2$, $k_p' = 50 \mu\text{A}/\text{V}^2$, $\lambda_n = 0.04 \text{V}^{-1}$, $\lambda_p = 0.05 \text{V}^{-1}$, $2|\Phi_F| = 0.7$ V and 0.8 V for n-channel and p-channel respectively.

**OR**

- (b) Draw and explain cascade amplifier using small circuit and hence derive the formula of small signal voltage gain and -3dB bandwidth. 07

- Q.3** (a) Explain the working of Flash ADC. 07
 (b) Using the small signal diagram derive the voltage gain and -3dB frequency of Active pMOS load inverter 07

OR

- Q.3** (a) Discuss Current Steering DAC. 07
 (b) What is oversampling? Explain Sigma Delta ADC 07

- Q.4** (a) Define the following with respect to Differential Amplifier. 07
 (i) CMRR (ii) ICMR (iii) Output Offset Voltage (iv) Input Offset Voltage (v) Differential mode voltage (vi) common mode voltage (vii) slew rate.
 (b) Explain Sense Amplifier? 07

OR

- Q.4** (a) Discussed Phased Frequency Detector 07
 (b) Explain MOSFET-Only Voltage Divider. 07

- Q.5** (a) Define the following specification of ADC 07
 (i) Missing Codes (ii) Offset and Gain Errors (iii) INL (iv) DNL (v) SNR
 (b) Draw and explain current source load inverter using small circuit and hence derive the formula of small signal voltage gain and -3dB bandwidth. 07

OR

- Q.5** (a) Discuss layout techniques for improving matching of the device used as current mirror. 07
 (b) Explain Wilson Current Mirror 07
