

**Name:**

**Id#**

**COE 360, Principles of VLSI Design, Term 981**  
**Quiz# 2 – Sec 3**

Date: Monday, October 12

- (I)** Explain why a pmos pass transistor produces a poor 0.
- (II)** Implement the following in CMOS using the smallest number of transistors assuming the availability of inverted inputs:
- (i)**  $Y = A \bar{C} B + \bar{B} D E + B A \bar{C} + \bar{B} \bar{D} \bar{E}$

(ii)  $Y = ACEF + ADEF + BCEF + BDEF$

(III) Calculate the threshold voltage of an nmos transistor assuming  $V_{SB}=3$  volt,  $V_{T0}=0.7$  volt,  $\gamma=0.6$  volt<sup>1/2</sup>,  $\phi_s=-0.4$  volt.