

**Name:**

**Id#**

**COE 360, Principles of VLSI Design, Term 043  
Quiz# 2**

Date: Sunday, July 16, 2005

**Q1.** Implement the following functions using **CMOS** with the smallest number of transistors possible. Note that transmission gates are to be used whenever this leads to a better implementation. Indicate the number of transistors needed for your implementation including the ones needed for inverting the inputs:

(1)  $F = A (A (B + C))'$

(2)  $F = A B C + (A B)' C'$

(3)  $F = [A C + A D + B C + B D]'$

(4) D-Latch.