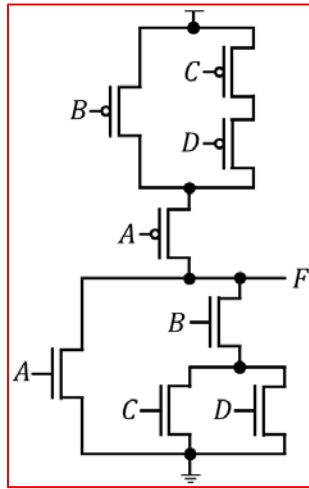# Homework Assignment 1
(Due Jan. 30th at the beginning of the class)

(1) **[Static CMOS Gates, 10 points]** Draw a transistor-level schematic for the following function. Use 4 nFETs and 4 pFETs. Available inputs: A, B, C, D.
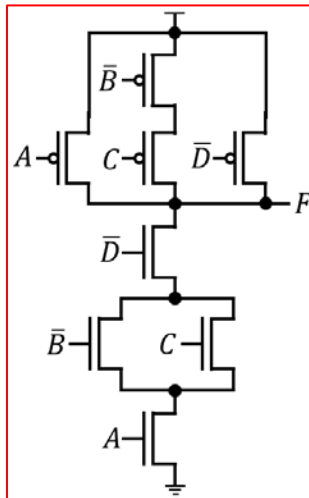
$$F = \overline{A + B \cdot (C + D)}$$

(2) **[Static CMOS Gates, 10 points]** Draw a transistor-level schematic for the following function. Try to minimize the total # transistors. Available inputs: $A, \bar{A}, B, \bar{B}, C, \bar{C}, D, \bar{D}$.

$$F = \bar{A} + B \cdot \bar{C} + D$$

$$F = \overline{\overline{\bar{A} + B \cdot \bar{C} + D}} = \overline{A \cdot (\bar{B} + C) \cdot \bar{D}}$$

(3) **[Static CMOS Gates, 10 points]** Draw a transistor-level schematic for the following function. Try to minimize the total # transistors. Available inputs: $A, \bar{A}, B, \bar{B}$.

$$F = A \oplus \bar{B} + \bar{A} \oplus B$$

$$\textcolor{red}{F = \overline{A \oplus B}}$$