Problem 1:

Suppose that each logic gate in the circuit below has propagation delay $t_p$ (all equal).

Suppose also that $A$, $B$, $C$, and $D$ all go from logic 0 to logic 1 at $t=0$.

Draw the signals $E$, $F$, and $G$. 
Problem 2.

Suppose the switch has been in position "1" for a long time. It switches to position "0" at \( t=0 \) and then switches back to "1" at \( t=8 \mu s \). Find \( V_{\text{out}}(t) \) for \( t \geq 0 \).
Problem 3:

Suppose that $V_{out}(0) = 1 \, \text{V}$. The switch has been in position "0" for a long time, then switches to position "1" at $t=0$, then back to position "0" at $t=3 \, \text{s}$. Find $V_{out}(t)$ for $t \geq 0$. 
Problem 4:

\[ \frac{W}{L} \mu p \text{co}x = 2 \text{ mA/}V^2 \]
\[ \lambda p = 0 \]
\[ V_{TH(p)} = -1V \]

Find \( V_{out} \).
Problem 5

$V_F = 0.7V$

Use large-signal model for diode.

\[ + V_{out} - \]
Problem 6:

\[ V_{in} = 2V \]

Use large-signal model for diode.
\[ V_F = 2V, \]
\[ \frac{W}{L} \mu_n C_0 x = \frac{1mA}{V} \]
\[ \lambda_n = 0 \text{ V}^{-1} \]
\[ V_{TH(n)} = 1V \]

Find \( V_{out} \).