Homework Assignment No. 1

Due on Wednesday, January 19, 2005

1.) Problem P1.7 of the text.

[Answers - a.) 10ns, b.) 20ns or 50MHz]

2.) Problem P1.8 of the text.

[Answers - a.) 866ps, b.) $t = \infty$, and c.) 2.88ns]

3.) Problem P1.9 of the text.

[Answers – a.) t_{down} = 8.66ms, b.) t_{up} = 20.8ms and c.) t_{ratio} = 2.4 or 0.42]

4.) Problem P2.1 of the text.

[a.) For the NMOS, V_{TO} = 0.018V, for the PMOS, V_{TO} = -0.138V, b.) V_{TO} = --1.24V, and c.) From part a.) $N_i = 3.82 \times 10^{12}$ ions/cm^2 (p-type), $N_i = 2.62 \times 10^{12}$ ions/cm^2 (n-type) and from part b.) $N_i = 8.4 \times 10^{12}$ ions/cm^2 (p-type)]

5.) Solve for the dc value of the drain current, I_{DS}, for the NMOS transistor shown assuming 0.18μm CMOS technology. The W and L for this transistor are 0.6μm and 0.2μm.