ECE 2100 Lecture Notes 4/23/03

A. Stolp
4/22/03,

Stuff Review for Final: Fri, 4/25 3:30 pm
Final: Mon, 4/28 8:00 am

To avoid a 5% grade penalty:

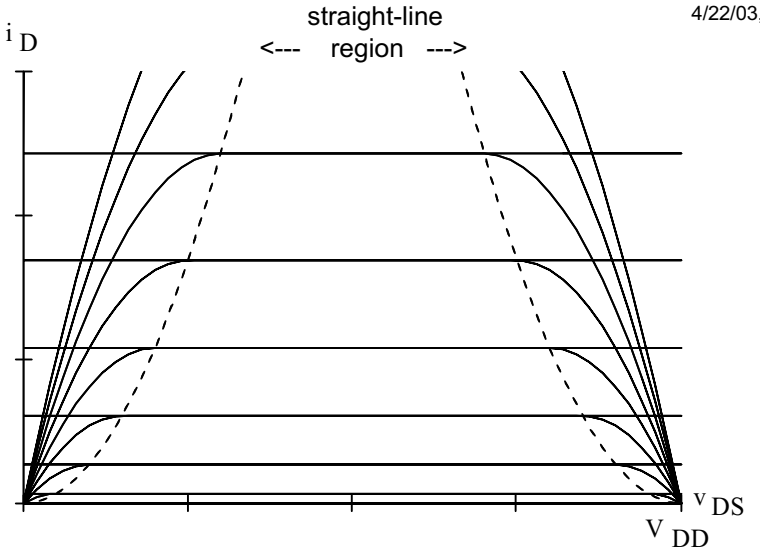
DO NOT blow off the Spice assignment

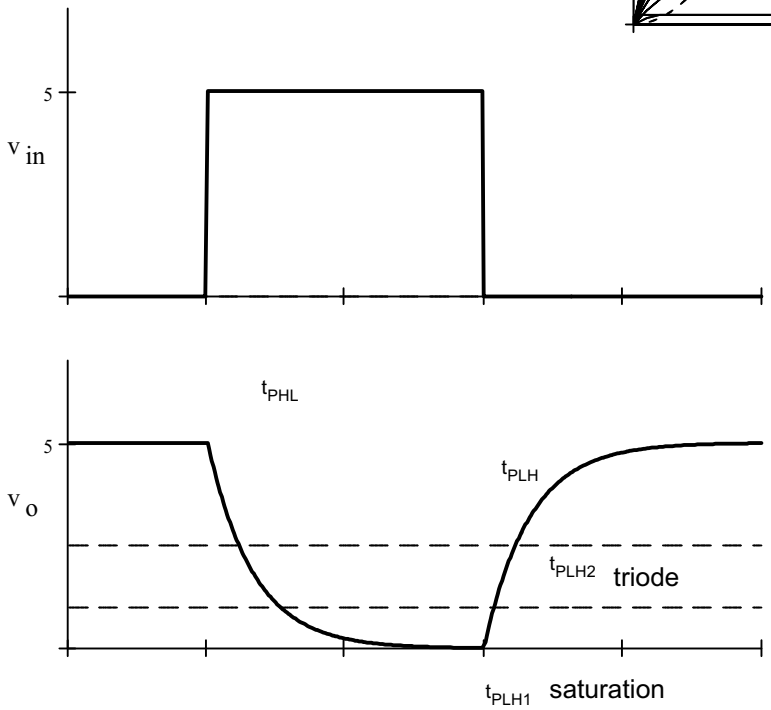
Make sure you've done all the labs.
If you're retaking the class, do lab 13.

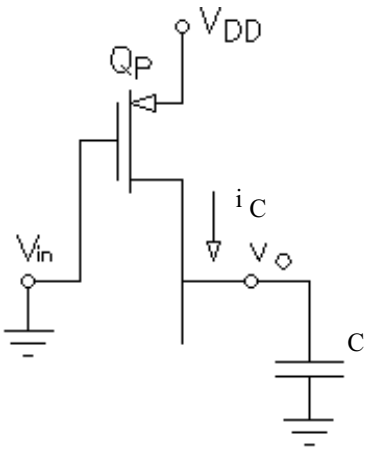
HW # 24, due: M 4/21 Ex5.24 - Ex5.34
Ex 5.28 Book answers are OK
May need for Ex5.33: V_{DD}= 5V, V_{tn}= 0.8V

HW # 25, due: W 4/23 Ex5.35 - Ex5.39

HW # 26, Cancelled







$$t_{PLH} = \frac{2\cdot C}{k'_p\cdot\frac{W_p}{L_p}\cdot\left(V_{DD}-\left|V_{tp}\right|\right)}\cdot\left(\frac{\left|V_{tp}\right|}{V_{DD}-\left|V_{tp}\right|}+\frac{1}{2}\cdot\ln\left(\frac{3\cdot V_{DD}-4\cdot\left|V_{tp}\right|}{V_{DD}}\right)\right)$$

Or, if $V_t \sim \frac{V_{DD}}{5}$ then this simplifies to: $t_{PLH} = \frac{1.6\cdot C}{k'_p\cdot\frac{W_p}{L_p}\cdot V_{DD}}$

Energy used to charge cap: $E = V_{DD}\cdot\int i_C\,dt$ but, when fully charged: $\frac{1}{C}\cdot\left(\int i_C\,dt\right) = V_{DD}$

so: $E = C\cdot V_{DD}^2$ This is the energy used per on-off cycle per CMOS pair

If you switch the gate at f cycles per second, then the power dissipated is: $P_D = f\cdot C\cdot V_{DD}^2$

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Well, That's ECE2100, Good Luck on the Final, and see you next year (hopefully not in an official capacity). Arn