1. (30 pts) For the following CMOS inverter,
(a) Plot its static VTC for $V_{in}$ from 0 to 5V
(b) Find NMH and NML graphically from your VTC plot
(c) Estimate $t_{PLH}$ and $t_{PHL}$ (write a short to facilitate your calculation. Hand calculation will be your last resort)
(The CMOS parameters are: $k_n = k_p = 0.5 \text{ mA/V}^2$, $V_{tn} = 0.8 \text{ V}$, $V_{tp} = -0.8 \text{ V}$, $C_L = 1 \text{ pF}$)

2. (20 pts) Two power supplies at 6 and 10 Volts are to be connected to a load $R_L$ ($R_L = 10 \text{ k}\Omega$) through 2 mechanical switches as shown below:
(a) Find $V_{out}$ when switch 1 is open and switch 2 is closed
(b) Find $V_{out}$ when switch 1 is closed and switch 2 is open
(c) Find $V_{out}$ when switch 1 and 2 are both open
(d) Find $V_{out}$ when switch 1 and 2 are both closed
(Use Abrupt on - off model for the diode with turn on voltage $V_f$ of 0.7 V)