6.012   Microelectronic Devices and Circuits

Tutorial #6

MOS Device Data.

$$\mu_N C_{ox} = 50\,\mu A/V^2, \quad \mu_P C_{ox} = 25\,\mu A/V^2, \quad V_{Ton} = 1V, \quad V_{Top} = -1V, \quad -2\phi_p = 0.84V$$

$$2\phi_n = 0.84V, \quad \gamma_n = 0.6V^{1/2}, \quad \gamma_p = 0.6V^{1/2}, \quad \lambda_n = \frac{0.1}{L}\,V^{-1}, \quad \lambda_p = \frac{0.1\,\mu m}{L}V^{-1} \quad [L \text{ in } \mu m]$$

1. Given an PMOS inverter shown in Figure T7.1 with a pull down resistor of 10 kΩ and V_{DD}=5.0 V. Assume the bulk is tied to the source.
   (a) Find V_{OH} with (W/L) = (10 μm / 1 μm).
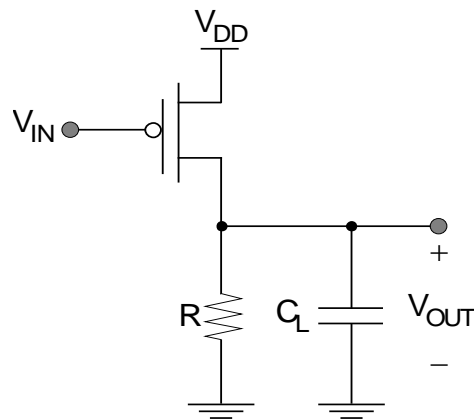   (b) Calculate NM_H and NM_L using the simplified hand calculation presented in lecture.

Figure T7.1

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