



Homework I

ENEE 359a: Digital VLSI Circuits, Spring 2008

Assigned: Tuesday, Feb 12; Due: Tuesday, Feb 19

Problem

Figure 1 below shows a CMOS inverter. The characteristics of the p-channel and n-channel transistors for $W/L = 1$ are shown in Figure 2. On the last two pages we provide templates, which you should use to present your intermediate and final answers. For the inverter in Figure 1, derive graphically the following characteristics.

- a) $V_{OUT}(V_{IN})$
- b) $I_D(V_{IN})$

Assume that the NMOS transistor has $(W/L)_n = 1$ and the PMOS has $(W/L)_p = 2$.

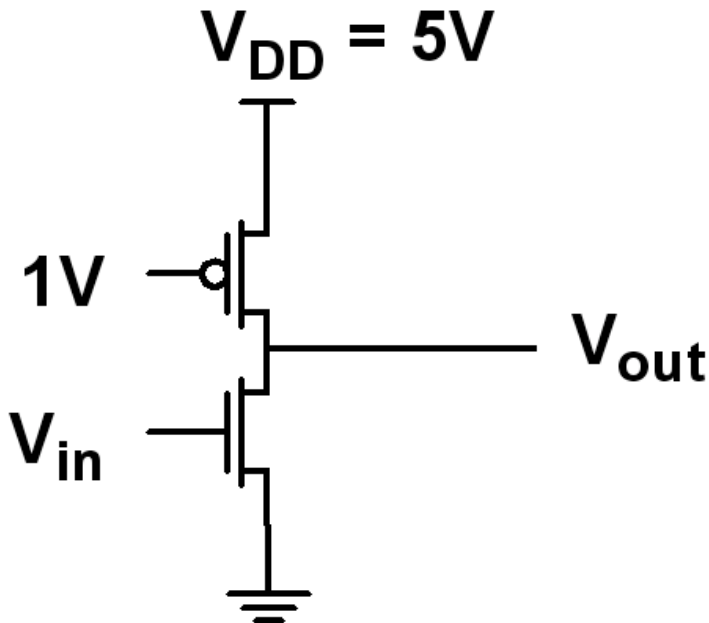
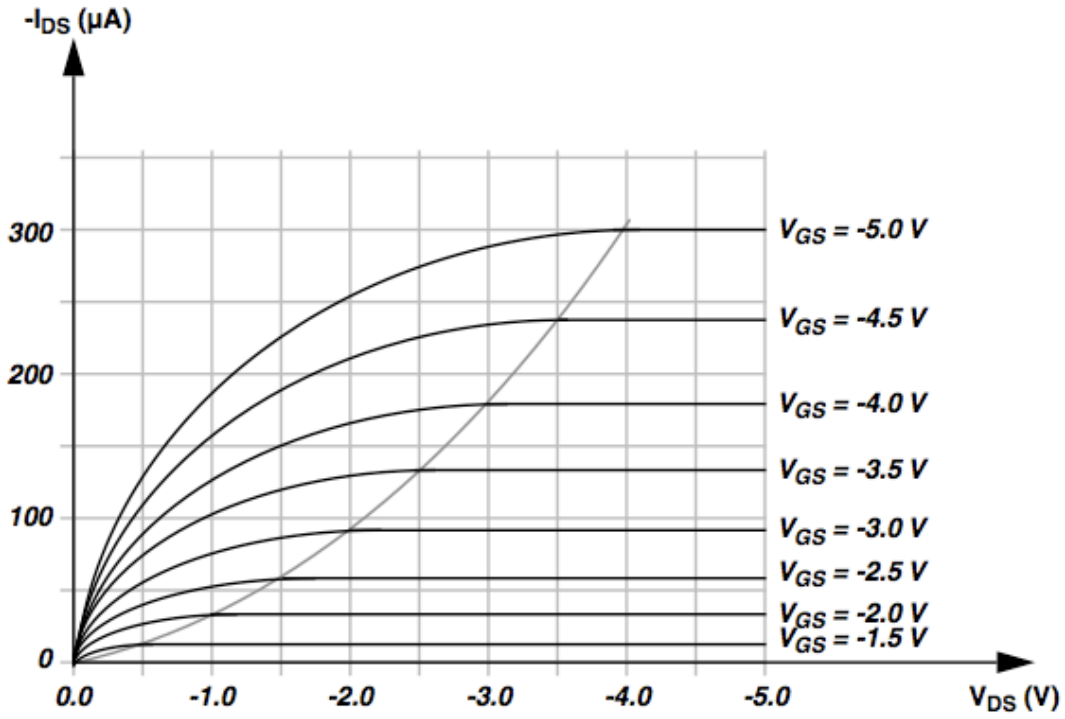
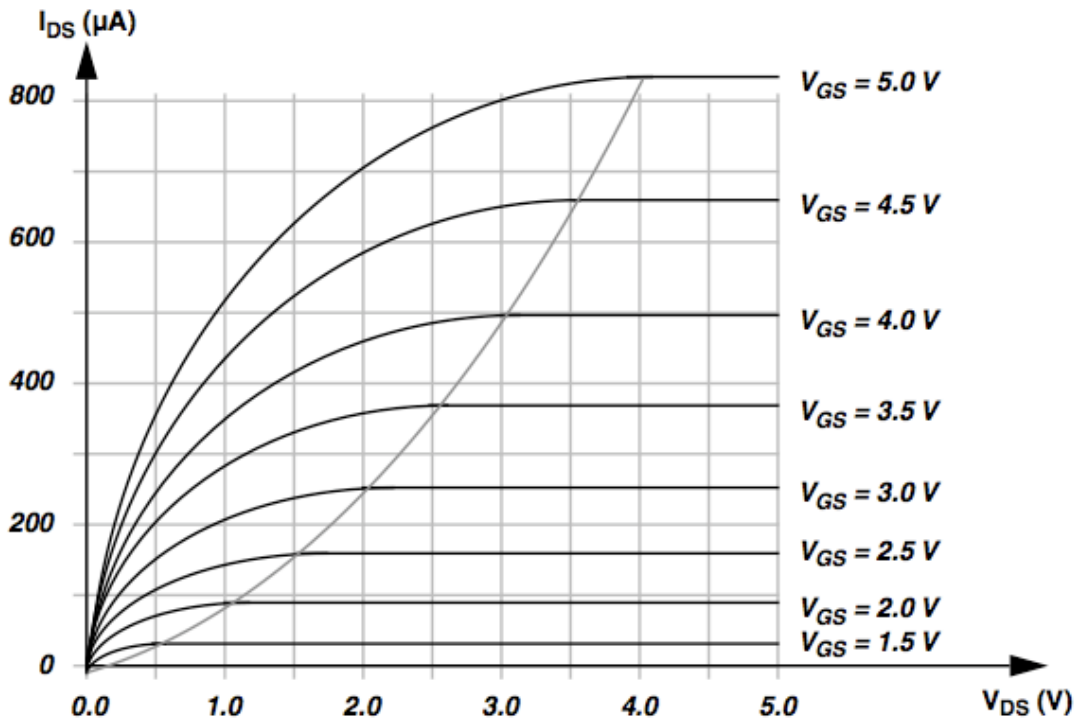


Figure 1



Characteristics of p-channel device with $W/L = 1$



Characteristics of n-channel device with $W/L = 1$

