

Homework 1

ENEE 359a: Digital VLSI Design, Spring 2007

Assigned: Thu, Feb 15 Due: Tue, Feb 20

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 $(W/L)_p = 2$.

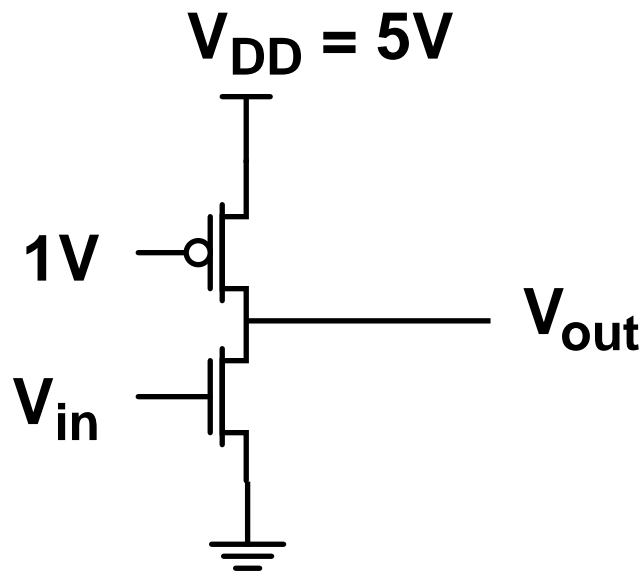
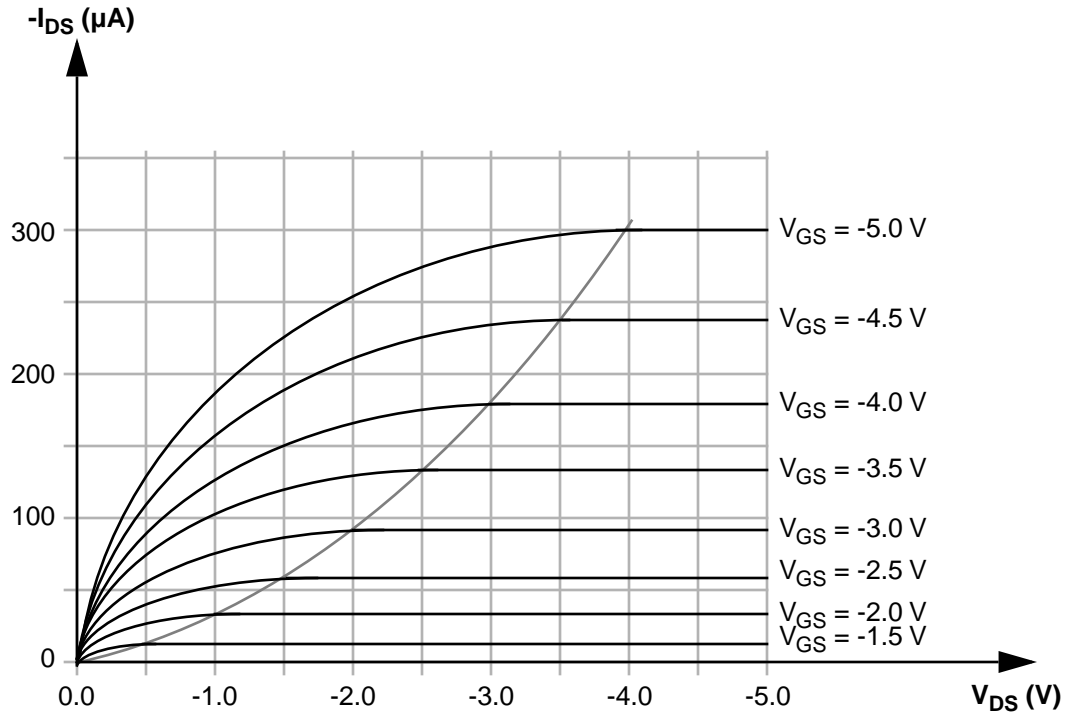
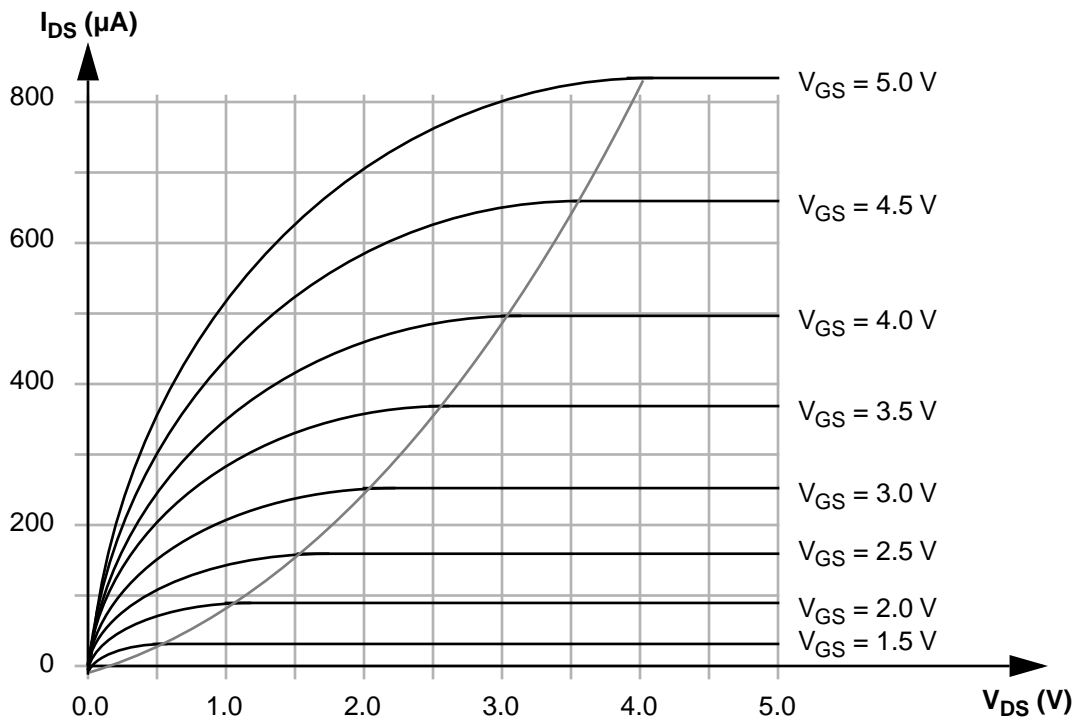


Figure 1



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



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

