# **Homework Assignment No. 2**

Due on Monday, January 31, 2005

1.) Problem P2.4 of the text.

[Answers - a.) Cutoff, b.) Cutoff, c.) Linear, and d.) Saturated]

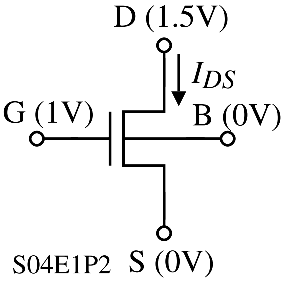
2.) Problem P2.5 of the text.

[Answers - a.) $V_x = 0.733$V and b.) $V_x = 0.6$V

3.) Problem P2.7 of the text.

[Answers - $C_G = 0.64$fF and $C_j = 0.19$fF]

4.) Solve for the dc value of the drain current, $I_{DS}$, for the NMOS transistor shown assuming 0.18µm CMOS technology. The $W$ and $L$ for this transistor are given in Problem 5.



5.) Given the layout for the NMOS transistor of Problem 2, find the value of $C_{gs}$, $C_{gd}$, $C_{gb}$, $C_{db}$, and $C_{sb}$ assuming that the junction depth of the source-drain diffusions is $x_j$ = 50 nm, $m$ = 0.5 and the lateral diffusion is 10nm.