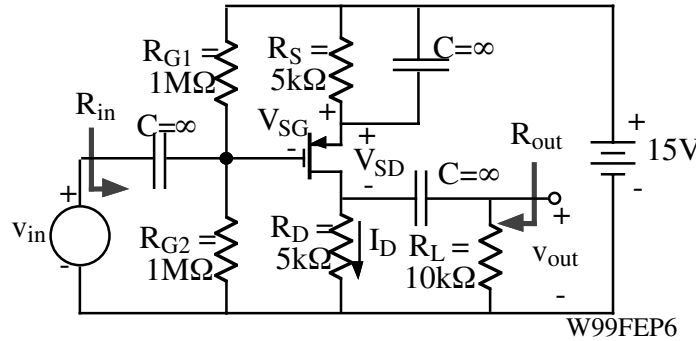## Homework Assignment No. 5

<u>Due on Wednesday, February 12, 2003</u>

1.) Find the dc operating point, the small signal voltage gain, v_{out}/v_{in}, the small signal input resistance, R_{in}, and the small signal output resistance, R_{out}, if $K_n = 0.1 mA/V^2$, $V_{TP} = -1V$, and $\lambda = 0.01V^{-1}$.

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2.) Problem 13.91 of the text.

3.) Problem 13.100 of the text. $[A_v = -4.60 \text{ V/V}]$

4.) Problem 13.108 of the text.

5.) A PMOS common-drain amplifier is shown. Assume the parameters of the transistor are $k_F = 0.5 mA/V^2$, $V_{TP} = -1V$, and $\lambda = 0$. (a.) If $I_{SD} = 0.5 mA$, find the small signal model parameter values for g_m and r_o. (b.) Find an algebraic expression for the small signal input resistance, R_{in}, the output resistance, R_{out}, and the voltage gain, v_{out}/v_{in}. (c.) Numerically evaluate the small signal input resistance, R_{in}, the output resistance, R_{out}, and the voltage gain, v_{out}/v_{in}.

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