## Homework Assignment No. 7
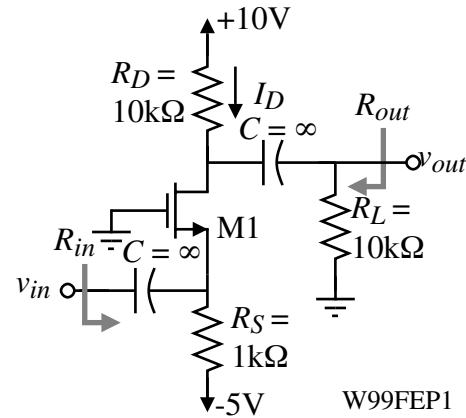
Due on Monday, October 4, 2004

1.) (a.) If $K = 0.1\text{mA/V}^2$ and $V_t = 1\text{V}$ for the n-channel MOSFET shown, find the dc value of $I_D$, $V_{GS}$, and $V_{DS}$. (b.) If the dc value of $I_D = 1\text{mA}$ (not necessarily the answer above) find the value of the small-signal input resistance, $R_{in}$, voltage gain, $v_{out}/v_{in}$, and output resistance, $R_{out}$.



2.) (a.) If $\beta = 100$ and $V_T = 25\text{mV}$ of the NPN transistor shown, solve for the dc value of collector current. (b.) If this collector current is 1mA (so if you found $I_C$ incorrectly, you will not be penalized on the rest of the problem) find the small signal values of the input resistance, $R_{in}$, output resistance, $R_{out}$, and voltage gain, $v_{out}/v_{in}$.
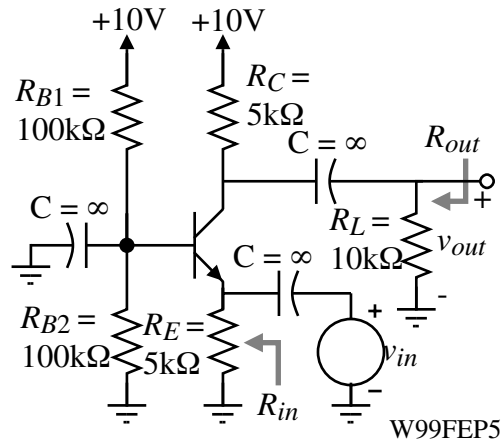


3.) Problem 14.26 (14.22: $R_S = R_I$ )of the text.

4.) Problem 14.38 (14.31) of the text.

5.) Problem 14.39 (no equivalent problem in first edition) of the text.