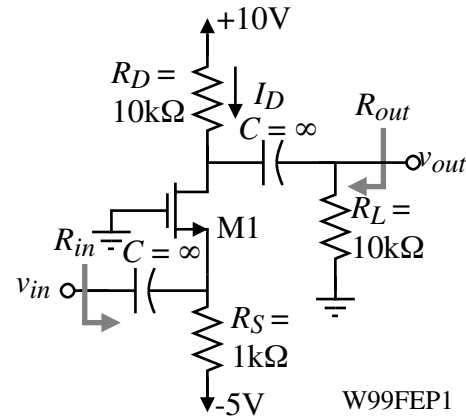


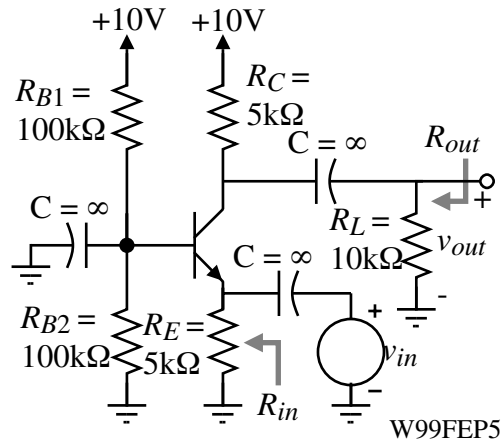
Homework Assignment No. 7

Due on Wednesday, February 25, 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 1 mA (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.