Homework Assignment No. 12

Due on Wednesday, April 9, 2003

1.) Problem 18.16 of the text.

2.) A shunt-shunt feedback amplifier is shown. Use the methods of feedback analysis to find the numerical values of $v_2/v_1$, $v_1/i_1$, and $v_2/i_2$. For Q1, assume that $h_{fe} = 100$, $g_m = 50\, mS$ and $r_o = \infty$. For M2, assume that $g_m = 1\, mS$ and $r_{ds} = \infty$.

3.) For each of the MOSFET amplifiers shown below, show how to connect a single resistor from the output to the input that achieves a series-shunt, series-series, shunt-shunt and shunt-series negative feedback amplifier. For each of the four configurations, identify on the schematic the correct variables (voltage or current) for $x_s$, $x_f$, $x_i$, and $x_o$. The outputs should be at the drain or source of M3.
4.) Problem 18.22 of the text.
5.) The simplified schematic of a feedback amplifier is shown. Assume that all transistors are matched and \( g_m = 1 \text{mA/V} \) and \( r_{ds} = \infty \). (a.) Where should the switch be connected for negative feedback? (b.) Use the method of feedback analysis to find \( \frac{v_2}{v_1} \), \( R_{in} = \frac{v_1}{i_1} \), and \( R_{out} = \frac{v_2}{i_2} \).

Please note that there are numerous feedback problems you can work (answers only are provided) on the class website.