Homework Assignment No. 9

Due Friday, March 31, 2006 in class

Problem 1 – (10 points)

Problem 8.1 of GHLM

Problem 2 – (10 points)

Problem 8.6a of GHLM (use: R_F=150KΩ, R_L=10KΩ, R_i=800KΩ, and R_o=200Ω)

Problem 3 – (10 points)

Problem 8.12 of GHLM

Problem 4 – (10 points)

Problem 8.14 of GHLM

Problem 5 – (10 points)

Problem 8.16 of GHLM

Problem 6 – (10 points)

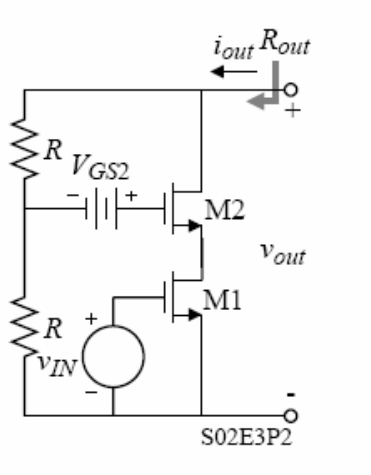
Problem 8.23 of GHLM

Problem 7 – (10 points)

Problem 8.24 of GHLM

Problem 8 – (10 points)

Use the Blackman's formula (see below) to calculate the small-signal output resistance of the stacked MOSFET configuration having identical drain-source drops for both transistors.
Express your answer in terms of all the pertinent small-signal parameters and then simplify your answer if $g_m > g_{ds} > (1/R)$.
Assume the MOSFETs are identical.



$$R_{out} = R_{out}(g_m = 0)\left[\frac{1 + RR(output\ \ port\ \ shorted}{1 + RR(output\ \ port\ \ open}\right]$$

(You may use small-signal analysis if you wish but this circuit seems to be one of the rare cases where feedback analysis is more efficient.)

Problem 9– (10 points)

Problem 8.26 of GHLM

Problem 10– (10 points)

Problem 8.30 of GHLM