ECE 351 Exam 1
Winter 2006-07

Name____________________

Section   2

CM____

Scores:
1)  
2)  
3)  
4)  

Total____________

I pledge on my honor that I did not copy any of this exam, and that this work is entirely my own. Furthermore, I did not use PSpice during this exam.

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Problem 1 (25 Points):

Find a numerical value for $I_{\text{OUT}}$ in the circuit above. For the MOSFETs assume that $K=10 \ \mu A/V^2$, $V_T = 1 \ \text{V}$, and $\lambda = 0$. Assume that all MOSFETs are matched.
Problem 2: (25 Points)

For the MOSFETs assume that $K=10 \ \mu A/V^2$, $V_T = 1 \ \text{V}$, and $\lambda = 0$. Assume that all MOSFETs are matched.

a) Find a numerical value for $I_{OUT}$ in the circuit above. (10 Points)

b) Find a numerical value for the voltage $V_x$ in the circuit above. (15 Points)
Problem 3: (25 Points)

For the MOSFETs assume that $K=10 \, \mu A/V^2$, $V_T = 1 \, V$, and $\lambda = 0$. Assume that all MOSFETs are matched. For the BJT, assume $\beta = 300$.

a) Find a numerical value for $R_X$ so that $I_{OUT} = 10 \, \mu A$. (10 Points)

b) Find a numerical value for the current source parallel resistance. For this part, assume that $\lambda = 0.01 \, V^{-1}$ and $V_A = 100 \, V$. (15 Points)
Problem 4 (25 Points)

Find the equivalent small signal input resistance $r_{IN}$ in the circuit above.