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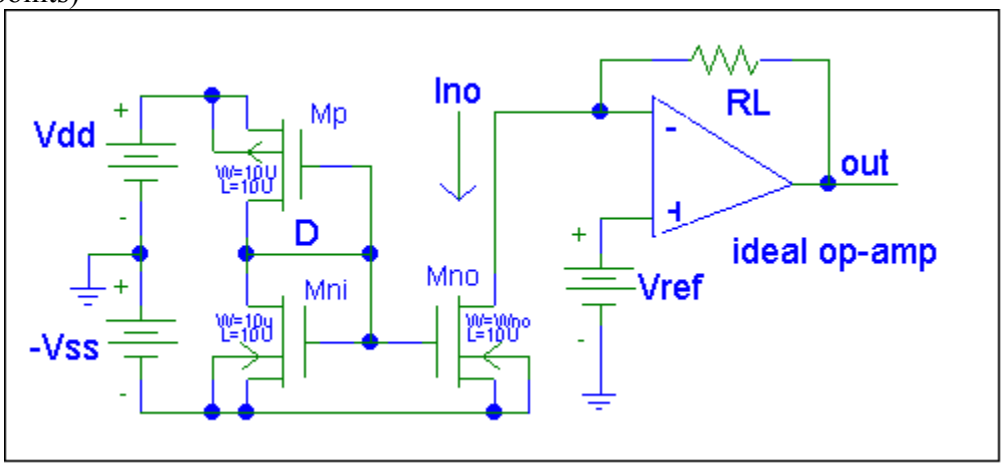
EE 303 Final Exam Spring 2007

Open book, open notes. Only signed exam books, certifying all work is your own, will be graded. Be sure to show your reasoning for partial credit. Good LUCK.

1. (50 points)

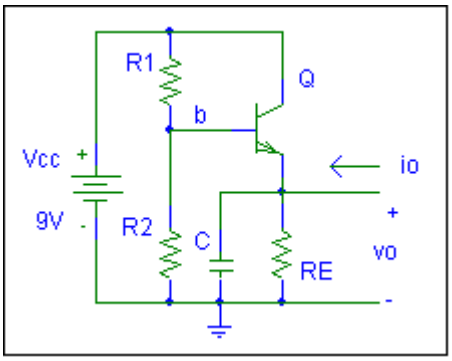


For the above circuit assume KPn=KPp=$5x10^{-4}$, VTOn=-VTOp=1.5V, λn=λp=0, Vdd=-Vss=5V, RL=1kOhm.

a) Show that Mno is in saturation when Vref=Vdd and under that condition find Wno for Ino=200uA.

b) For Wno=10u find the voltage (w.r.t. ground) at node out, Vout, versus Vref for Vss≤Vref≤Vdd. Sketch Vout versus Vref labeling important points.

2. (50 points)



Assume the transistor has BF=199 and IE=-2mA, VA=100V, RE=1.15kOhm, Cπ = 0. Use VT=26mV and VBE=0.7V if needed..

a) For R2=1MegOhm find R1 and give the resulting IC, gm, gπ, go.

b) Ignoring R1 & R2 draw the small signal equivalent circuit.

c) Find the small signal output impedance zo(s)=vo/io(s) with C as a parameter. Determine if there is a C for a 3DB point of zo at 1MegHz and if so give C's value and if not explain why not.