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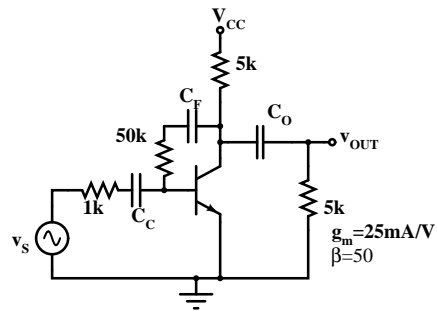
University of Puerto Rico
Electrical and Computer Engineering Department
INEL 4202 - Electronics II - Spring 2001 - Exam 1 - Prof. M. Toledo
THERE ARE THREE PROBLEMS - BE CLEAR OR LOOSE POINTS

1. An amplifier was designed using a bipolar transistor with $C_\mu = C_\pi = 5pF$, a $10\mu F$ coupling capacitors C_C and a $50\mu F$ bypass capacitor C_B . The resistances seen by these capacitors are $R_\mu = 10k\Omega$, $R_\pi = 1k\Omega$, $R_C = 1k\Omega$, $R_B = 100\Omega$, respectively. A $1k\Omega$ resistor is connected in parallel with C_B and the amplifier's midband gain is 1234.
 - (a) Write an expression for the gain as a function of frequency, valid for all frequency bands. (10 pts)
 - (b) Sketch the magnitude bode plot of the amplifier. (10 points)
 - (c) Find the approximate effective -3 dB frequencies that determine the amplifier's bandwidth. (10 points)
 - (d) Find the exact amplifier's gain at $50Hz$.

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2. Use the *short-circuit time-constant* method to determine the resistance seen by C_F in the following amplifier. You should use the low-frequency transistor model. (30 pts)



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3. Derive an expression for the resistance seen by C in the following circuit. (30 pts)

