

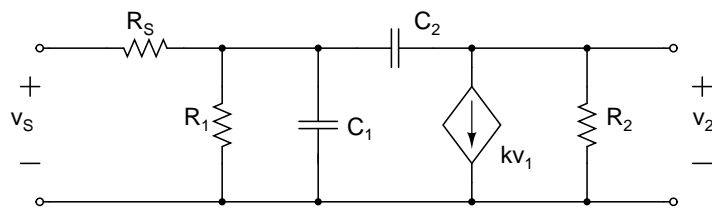
Name: _____

Student No: _____

Electrical and Computer Engineering Department
University of Puerto Rico - Mayaguez, P.R.
Electronics II - Fall 1999 - Second Exam - Prof. Manuel Toledo

EACH PROBLEM IS 25 POINTS
BE CLEAR AND WELL ORGANIZED OR LOOSE POINTS

1. The high-frequency equivalent circuit for an amplifier is shown below. Use Miller's Theorem to derive an expression for the voltage gain, $A_V(s) = \frac{v_o}{v_s}$, as a function of frequency. The expression should be valid for mid- and high-frequencies. (HINT: You can use the open-circuit time constant method to find the high-frequency poles.)



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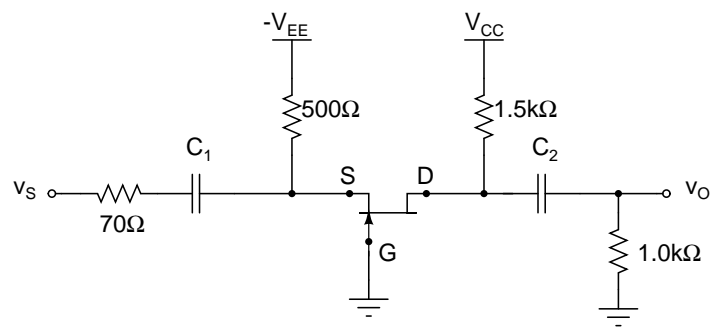
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2. Find the poles associated with C_1 and C_2 for the circuit in problem 1. (HINT: You can use the open-circuit time constant method to find the poles, but you can not use Miller's Theorem this time.)

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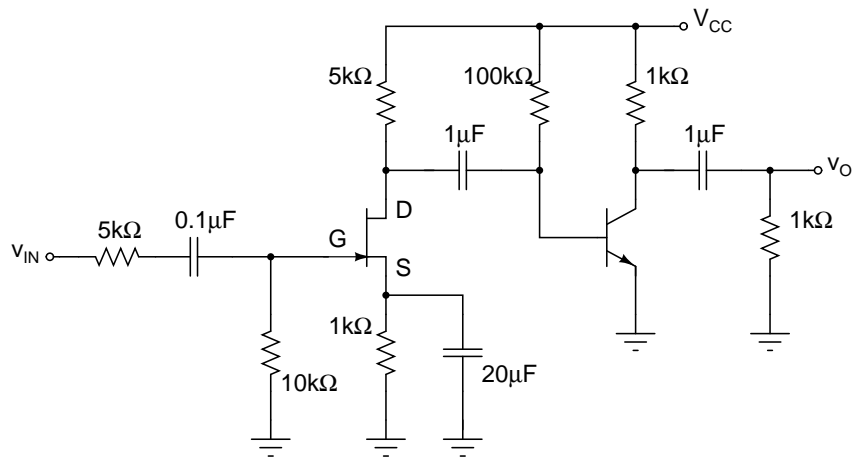
3. For the amplifier shown below, select C_1 and C_2 such that the effective low-frequency pole is at 65Hz. (HINT: Use the short-circuit time constant method.)



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4. Find the dominant high-frequency pole for the following amplifier. For the BJT, use $C_\mu = 5\text{pF}$, $C_\pi = 100\text{pF}$, $\beta = 50$, and $r_\pi = 175\Omega$. For the JFET, $C_{gs} = C_{gd} = 2\text{pF}$ and $g_m = 8\text{mA/V}$.



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