Name: _____

Student No: _____

Electrical and Computer Engineering Department
University of Puerto Rico - Mayaguez, P.R.
Electronics II - Summer 1999 - Third Exam - Prof. Manuel Toledo
EACH PROBLEM IS 20 POINTS

1. An amplifier with poles at $300kHz$ and $3MHz$ is made into a voltage-series feedback amplifier by subtracting 10 % of the output voltage to it's input. Assume that the effect of the feedback network on the original amplifier midband gain A_v is negligible. What is the voltage gain A_v if the phase margin is 45 degrees?.

Name: _____

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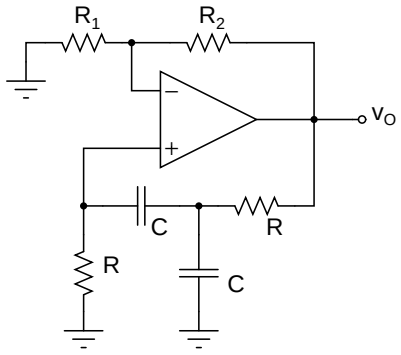
2. For the oscillator shown below, derive an expression for the frequency of oscillation in terms of R and C. What minimum value of $\frac{R_2}{R_1}$ is required for oscillations to be maintained?



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3. Design a class B amplifier capable of delivering 25 watts to a 10 ohms load. Your design should specify minimum power supply rated voltage, current and power, as well as the dissipation requirements for the PNP and NPN power transistors. Your design must work for output signal levels lower than the maximum.

Name: _____

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4. Design a 680kHz Wein-bridge oscillator. Use an ideal op-amp as your active element. Find suitable values for all pasive components. Draw the schematic diagram.

Name: _____

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5. A transistor is operating in an ideal class B amplifier with a $1k\Omega$ load. A d.c. meter in the collector circuit reads an average current of 10 mA. How much signal power is being delivered to the load?