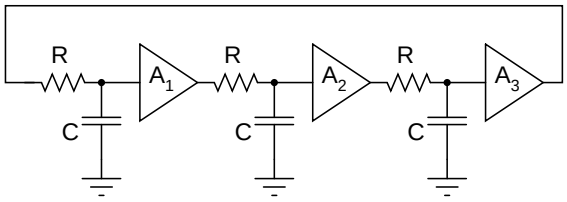
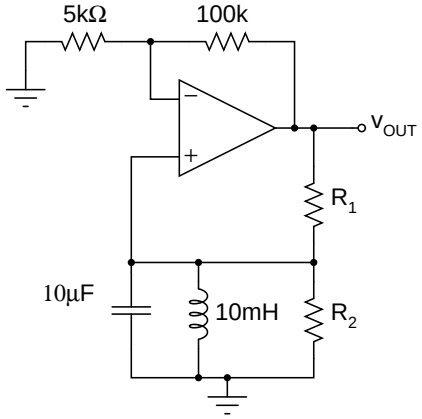
NAME: STUDENT NO.:

University of Puerto Rico
Electrical and Computer Engineering Department
INEL 4202 - Electronics II - Summer 2001 - Exam 4 - Prof. M. Toledo
THERE ARE THREE PROBLEMS + 5 BONUS POINTS FOR CLARITY

1. The oscillator shown below uses three ideal amplifiers that exhibit infinite input resistance and zero output resistance. Find the frequency of oscillation and a condition that the product of the gains $A_1A_2A_3$ must satisfy for the circuit to work as an oscillator. (30 points)



2. For the oscillator shown, find the frequency of oscillation and the maximum value of R_1 required for oscillations if $R_1 + R_2 = 10k\Omega$. (35 points)



3. For the ideal class B push-pull amplifier shown below, assume that the input is sinusoidal. Determine (35 points)
   (a) the maximum signal power
   (b) the power dissipation in each transistor when the output power is maximum,
   (c) the efficiency if the output voltage is half of the maximum possible without saturating either transistor,
   (d) the maximum power dissipation at each transistor for an arbitrary amplitude imput, and
   (e) the efficiency of the amplifier when transistors dissipate this maximum power.