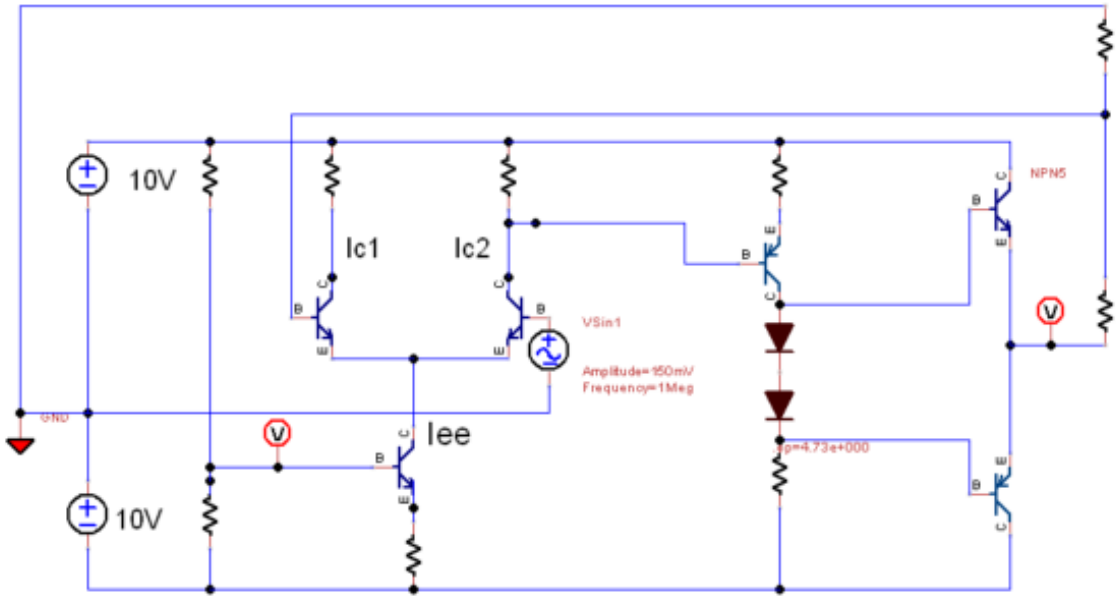
ENEE 307: Lab 5 Upgrade, Fall 2022



The circuit above is a very simple operational amplifier with feedback to provide a closed loop gain. The goal for this Up-Grade is for you to provide the values of each resistor to have a proper DC bias and a good AC voltage gain at the same time.

1. Identify the three stages of this circuit and describe their function in a sentence or two.
2. Give algebraic expressions for the small signal open loop and closed loop voltage gain of this circuit.
3. Circuit Design
    a. Provide values for all the resistors so that the circuit has a DC bias such that Ic1 and Ic2 are both 1mA. Also, when there is zero signal at the input, both the DC and AC voltages at the output should be zero. The values of the resistors should typically be in the 1k to 10k range. (Note, it will be difficult to get exactly a DC value of zero at the output, so try to get it to be less than |10mV DC|.)
    b. Design the circuit by choosing the resistor values so that there is an open loop gain of greater than 150V/V (without the feedback resistors). This part of the design should be done without the feedback resistors.
    c. Run the circuit on CoolSPICE and show that your design works. If is does not, adjust the resistor values until it does.
4. Provide the feedback resistor values so that the closed loop gain is 10V/V and show this on CoolSPICE.