

10. Op Amp Circuit Simulation with PSpice

Objectives: This experiment emphasizes the software simulation for Op Amp circuit behaviors. Specifically, this lab is to solve three Op Amp circuits by using PSpice.

Pspice: Introduction to the Pspice was presented, and a new **Introduction to OP Amp circuit simulation** is available on the class note web page.

NOTE: This lab is done as an assignment.

If you can do by yourself, you do not have to come to the lab. Instead, work on your own schedule, and submit your work along with your comments, by next Monday.

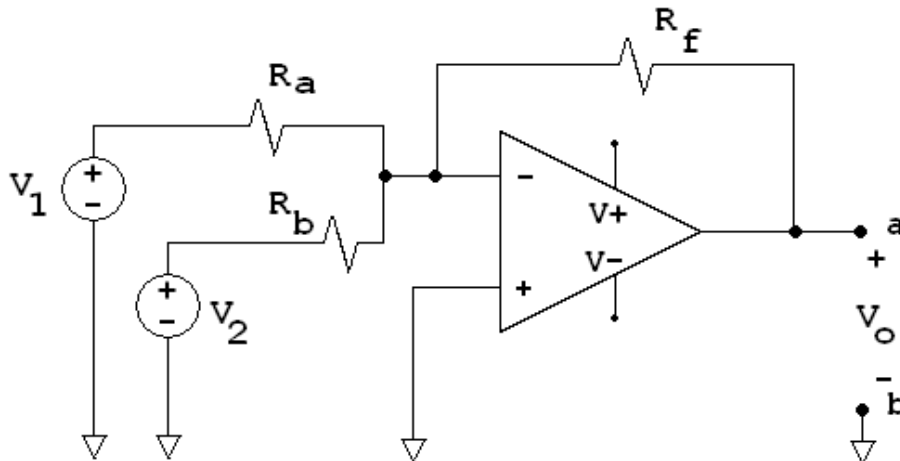
PRE-LAB -10

There is no pre-lab for this experiment.

LAB -10: Name: _____ ID#: _____

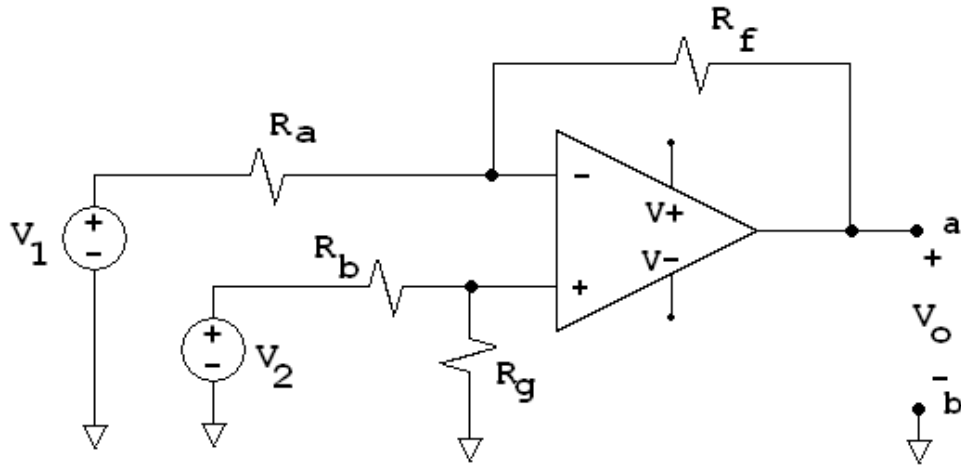
1. Simulate the circuit shown below and provide plots of V_1 , V_2 , and V_0 , for the following values. (Note: $R_a=R_b=1K$, $R_f=2K$, $V_+=5V$, $V_-=-15V$.)

- (i) V_1 is sinusoid with magnitude of 1[V] and frequency of 1 kHz. V_2 is a DC voltage of 1[V].
- (iii) V_1 is sinusoid with magnitude of 2[V] and frequency of 1 kHz. V_2 is a DC voltage of 2[V]



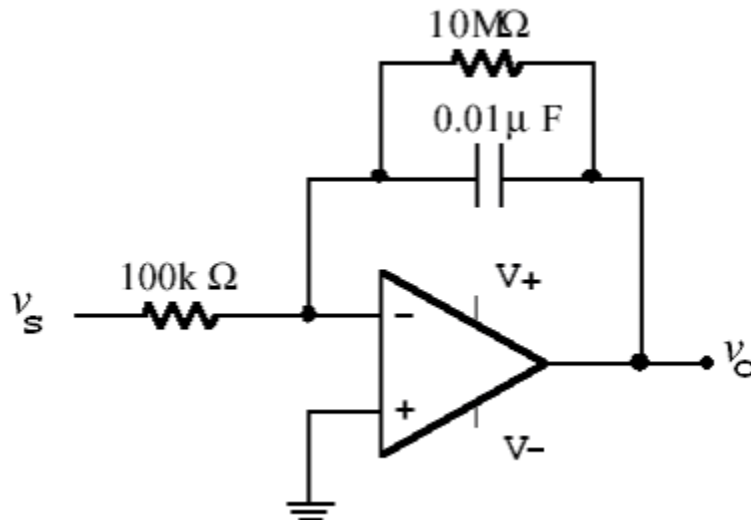
2. Simulate the circuit shown below and provide plots of V_1 , V_2 , and V_0 , for the following values. (Note: $R_a=R_b=1K$, $R_f=1K$, $V_+ = 10V$, $V_- = -10V$.)

- (i) V_1 is sinusoid with magnitude of 1[V] and frequency of 1 kHz. V_2 is a DC voltage of 1[V].
- (iii) V_1 is sinusoid with magnitude of 2[V] and frequency of 1 kHz. V_2 is a DC voltage of -2[V]



3. Simulate the circuit shown below and provide plots of V_s and V_0 , for the following values of V_s . (Note: $V_+ = 15V$, $V_- = -15V$.)

- (i) A sinusoidal wave of magnitude 2 [V] and frequency 500Hz for V_s .
- (ii) A triangle wave of magnitude 2 [V] and frequency 500Hz for V_s
- (iii) A square wave of magnitude 2 [V] and frequency 500Hz for V_s .



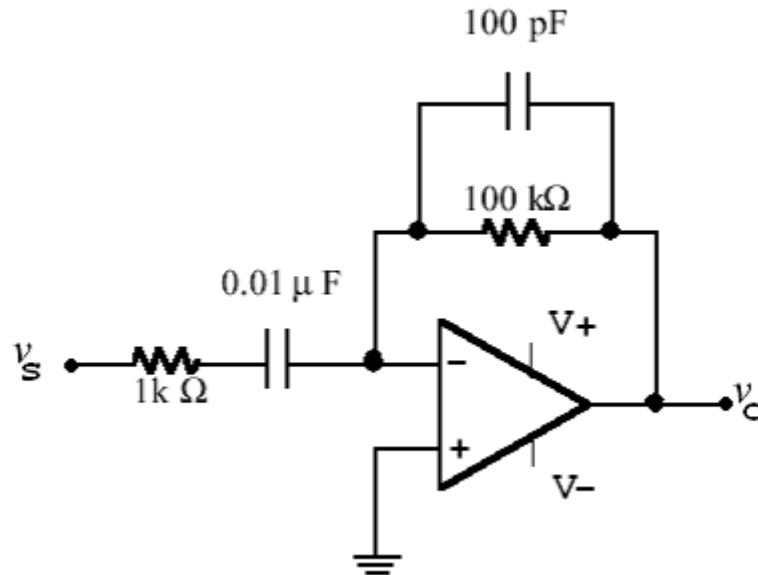
4. Do the #3 problem above without the 10M Ω resistor in the circuit.

5. Simulate the circuit shown below and provide plots of V_s and V_o , for the following values of V_s . (Note: $V_+ = 15V$, $V_- = -15V$.)

(i) A sinusoidal wave of magnitude 1 [V] and frequency 2KHz for V_s .

(ii) A triangle wave of magnitude 1 [V] and frequency 2KHz for V_s

(iii) A square wave of magnitude 1 [V] and frequency 2KHz for V_s .



6. Do the #5 problem above without the $100\ pF$ capacitor in the circuit.