EE241: COMPUTER TOOLS FOR ELECTRICAL ENGINEERS
PROJECT-2 Due: December 25, 2017

Instructor: Arda D. Yalçınkaya
Total: 25points.

As a design engineer of a small electronics company, you are given your first task. After evaluating the design choices, you finally decide to implement a wheat-stone bridge circuit (which is shown in Figure 1) for the readout electronics of the company's new force sensor.

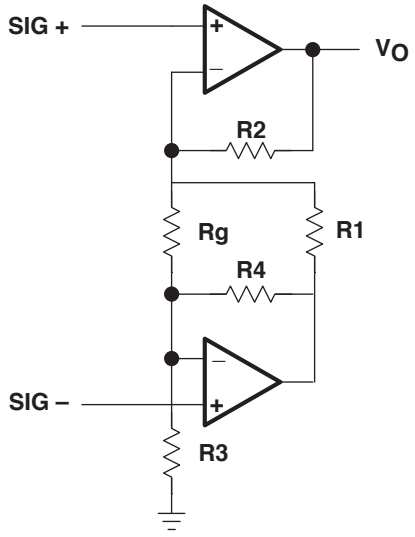

Figure 1 - R1=R2=2k, R3=R4=1k, Rg=1k

a. (**7p**) Implement the circuit in PSPICE containing OPAMPS shown below (Figure 2). Determine the output voltage when Vin =((SIG +) – (SIG -)) varies between -5V and 5V.

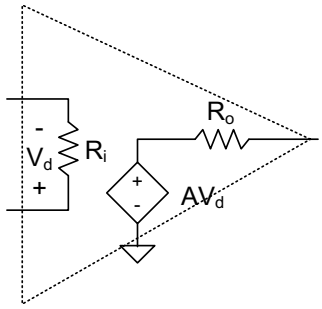

Figure 2- Ri=150kΩ, Ro=250Ω, A=5500

b. Implement the circuit in PSPICE containing TL072 OPAMPS from Texas Instruments (http://focus.ti.com/docs/prod/folders/print/tl072.html). You should bias the OPAMPS with +/- 10V.

i. (7p) Determine the output voltage when Vin =((SIG +) – (SIG -)) varies between -5V and 5V. Compare your results with part (a).

ii. (6p) Assume Vin=1.2V. Simulate the circuit behavior to obtain the range of Vout when you use 25% tolerance resistors.

iii. (5p) Determine the output voltage when Vin is a 1.5V peak-to-peak sine wave at 1 kHz.

NOTES:

• Please return a short report answering the questions above. You should include in your report all the schematics, probe screens, custom libraries that you used, etc.

• This is an individual project. Please type and sign the following statement:

"I pledge my honor that I have neither given nor received any unauthorized aid on this assignment."

Signature: