Lab 7: Prelab

Read through the entire lab assignment and complete the following before coming to lab. The prelab should be completed by individual students, not by a lab team.

Part 1: LabVIEW User Interface

Consider the input and output needs of an instrumentation amplifier, and think about how those needs could be met using a LabVIEW interface. If necessary, look back at Lab 6 and note the inputs and outputs required to test circuit features. Think of how you would construct the "instrument panel" for a LabVIEW vi. For your prelab assignment, sketch an initial concept for the user interface of this vi (what toggles, buttons, displays, etc. would be on your user interface). Be sure to consider both the AC and DC requirements. You will be asked to implement these functions during the in-lab assignment, so the better you prepare here the faster that will go. You are welcome, but not required, to start constructing your .vi in LabVIEW before coming to lab.

At the beginning of the lab, ask the TA to review your LabVIEW plan/sketch and sign off on the Prelab Grading Sheet. That way you can keep your plan/sketch for use during the lab. At the end of the lab, turn in your plan/sketch and the signed Prelab Grading Sheet.

Part 2: Variable Gain Instrumentation Amplifier

Within a SPICE simulation program, construct the *variable gain instrumentation amplifier* circuit defined by the schematic in part D of Lab 7. Use the OP467 subcircuit for the opamp.

1. Connect the negative input to analog ground and the positive input to a sine wave with 100mV amplitude and 1kHz frequency. Simulate the transient analysis for R_6 resistance values from 10kΩ to 100kΩ (the max value of your trimmer) in 10kΩ steps. Record the output voltage amplitude at each resistance on the table in the Prelab Grading Sheet and calculate the gain at each R_6 value (remember, the input is 100mV amplitude). Then, sketch a plot the *differential gain* vs. the resistance of R_6 using the grid on the Prelab Grading Sheet. Be sure to label the axes.
2. Next, connect both inputs to a sine wave with 1V amplitude and 1kHz frequency, simulate the transient analysis for several values of R_6, and complete the table in the Prelab Grading Sheet. Then sketch a plot the *common mode gain* vs. R_6. Label the axes

Submit a print of your SPICE netlist along with the Prelab Grading Sheet.

Lab 7: Prelab Grading Sheet

Name:_____

Part 1: LabVIEW User Interface

TA check off: Part 1 LabVIEW plan (TA signature) _____

Part 2: Variable Gain Instrumentation Amplifier

Differential Gain vs. R_6.

R_6	***10k***	***20k***	***30k***	***40k***	***50k***	***60k***	***70k***	***80k***	***90k***	***100k***
Vout										
Gain										

Common Mode Gain vs. R_6.

R_6	***20k***	***40k***	***60k***	***80k***	***100k***
Vout					
Gain					

Lab 7 Grading Sheet

PARTNER NAMES: _____

B.1a

trimmer value = _____Ω

B.2

max voltage = _____V min voltage = _____V

differential gain= _____

B.3

TA check off (TA signature) _____

C.2

Print DC transfer function (Step 1 to 3 of part D in Lab 6)

Differential gain= _____

Common mode gain=_____

C.3

trimmer value = _____Ω

C.4

TA check off of LabVIEW operation (TA signature) _____

D.5

TA check off (TA signature) _____

E.7

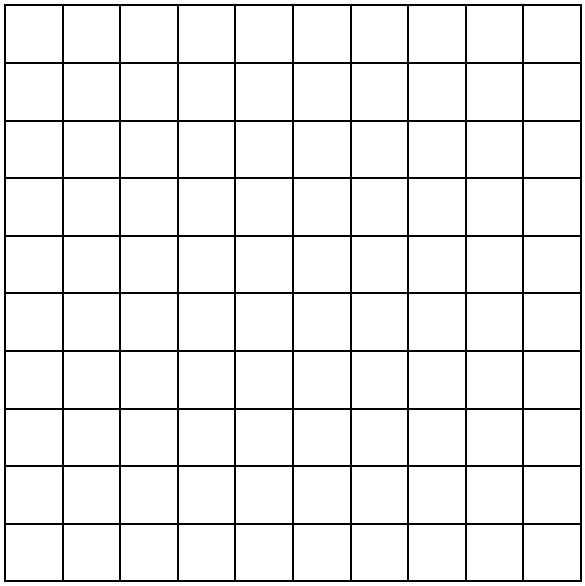
_____

_____

_____

E.8

Frequency	1KHz	10KHz	100KHz	1MHz	10MHz
Amplitude					



E.9

3dB bandwidth=_____

E.10

_____

_____

_____

E.11

TA check off (TA signature) _____