Lab 8 Grading Standard:

1) *In grading, do not explicitly assign points to the various sections. Rather, take points off for incorrect, incomplete or missing items.*
2) *When you take point off, be sure to write a short comment as to why the points were lost.*
3) *Example: (-1) What is the measured value of the component?*
           (-3) What is the mathematical formula that you are
                 plotting on top of your data?

General Notes:
- The axis of all plots must be labeled. This should include the quantity, the units and numerical values.
- The boxed questions should be answered in the lab book.
- Procedures must have a circuit diagram.
- Measured values of components used should be recorded in the lab book.
- Relevant formulas should be included in the lab book.
- Formulas for computed quantities in tables should be near the table in the book.

Failure to measure a component value when possible (max -1 per occurrence)
Missing units on components, plot axes, tables ... (-1 per occurrence).
Missing plot (-4 per occurrence).
Missing axes labels on plots (-1 per label).
Missing column labels on tables (-1 per label).
Missing formula for computed quantity in table (-1 per table)--can be in column title
Missing important formulas (-2 per occurrence)
No fit to linear curves (-2 per occurrence).
No fit values with units (-2 per occurrence).
No comparison of fit values with expectations when possible (-2 per occurrence).
Missing theoretical calculations, including formulas (-3 per occurrence).
Failure to answer questions (-2 per question, maximum of -10)

Pre-lab Signature: 10

Purpose/Introduction 5
There should be a two to five line description of what they are going to do in this lab. This is all or nothing for five points.

Inverting Amplifier:

Procedure: 5
There should be a several line procedure that shows the circuit, indicates where they are going to measure voltages, what the measured values of the components are.

Preparation Work: 10
There should be details as two what values they would like to choose for R1, R2, RC and RE as well as C1 and C2. They should note which values they would like, and then be sure to include the actual values of the components that they used.

Data: 20
In this section they build the circuit and make a series of voltage measurements. They should indicate what is being measured and the measured voltage. In particular, they are asked to measure the output voltage of the voltage divider both before and after the amplifier is attached and to check the value of VC. They should see very little sag with the follower on the circuit.

There should be a sketch showing vb, ve and vc for 1 0.1Vp-2-p signal.

They now measure the frequency response. There will be a high-frequency roll-off that is probably not fully compatible with the scope probes. They need to make a Bode plot for this.

For the voltage dependence of the gain, they should see a constant gain until they start clipping and/or saturating. Recall that because the output is inverted, clipping will be on the high side and saturation on the low side.

Finally, they should measure the output resistance of the circuit. We anticipate that this should be RC, they should compare what they get with the expected value.

Inverting Amplifier with By-pass Capacitor:

Circuit Design: 5
What is the value of CE that is being used? Explain why that value was chosen?

Procedure: 5
The procedure should include circuit diagrams, measured values of components and a description of what they are going to do. In particular, they are building an input voltage divider for the signal and possibly switching to a more stable DC power supply.

Data: 15
They need to now collect data as a function of frequency to be able to produce a Bode plot.
This should cover a similar range to what was done in the first part.
They also want choose an intermediate frequency (1kHz?) and measure the gain as a
function of the input voltage .

Analysis: 10
There should be a Bode plot of this data as well as a plot showing the gain as a function of
input voltage.

Questions: 10

Conclusion/Summary   5