UNIVERSITY OF UTAH
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
ECE 2280

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150 pts Lab #2 Notebook Grading

THE FOLLOWING ITEMS ARE REQUIRED:

- Student's work reproducible from notebook.
- Title and date for each lab section.
- Written in ink.
- Student signed every page.
- Student dated every page.

30 pts PRE-LAB:

10 pts (1a)
- 6 pts Design a circuit to produce Vout = Vin.

10 pts (2)
- 6 pts Design a non-inverting amplifier to produce a gain of 101 V/V.
- 4 pts Build the non-inverting amplifier on your breadboard.

10 pts (2a)
- 5 pts Description of slew-rate.
- 5 pts Description of clipping.

30 pts EXPERIMENT 1:

5 pts 1.
- 1 pt Measurement of $V_{out.}$
- 1 pt Measurement of current through the 1k "load" resistor.
- 3 pts Describe in detail where the additional current comes from.

15 pts 2.
- 10 pts Created Bode magnitude plot.
- 5 pts Rough sketch of the Bode magnitude plot with the following points marked: low-frequency value in the flat section, "corner" frequency (f_c), and the downward slope.

5 pts 3. Comparison of measured f_c and expected $f_{c.}$

5 pts 4. Verification that $V_{out} \sim V_s$ for a reasonable frequency.

50 pts EXPERIMENT 2:

15 pts (1b) Verification of gain (should be 101 V/V) for a low-frequency value.

5 pts (1c) -3dB point.

5 pts (1e) 2 measurements beyond f_c and the slope of the frequency response curve.

5 pts (1f)

- 2 pts Measurement of the phase shift at f_c.
- 3 pts Comparison of the theoretical phase-shift (-45º) to your measured phase-shift.

5 pts (1g)

- 1 pt Measurement of the gain at $5f_c$.
- 1 pt Measurement of the gain and phase-shift at $10f_c$.
- 1 pt Comparison of theoretical gain decrease (factor of 2) to your measured gain decrease.
- 2 pts Comparison of theoretical phase-shift of -90º at $10f_c$.

5 pts (2a)

- 1 pt Sketch of the triangular waveform and indication of the slewing on the sketch.
- 1 pt Measurement of the slope of the triangular waveform.
- 3 pt Comparison of measured slew-rate to the slew-rate on the data sheet.

5 pts (2b)

- 1 pt Value for fmax.
- 1 pt Measurement of the output voltage (Vpp) at fmax.
- 3 pts Comparison of fmax to the theoretical value of fmax.

5 pts (3a)

- 1 pt Sketch of the clipping waveform and indication of the clipping on the sketch.
- 1 pt Measurements of the clipping levels L+ and L-.
- 3 pts Comparison of the data-sheet clipping levels to your measured clipping values.

40 pts EXPERIMENT 3

25 pts 1.

- 10 pts Circuit built correctly.
- 15 pts Circuit works.

8 pts 2. Description of how the volume-control works.

7 pts 3. How much current is being pulled away from the power-supply.