Experiment Report
RC Filters and LabVIEW

Name: _____

Name: _____

TA: _____

Section: _____

1. Do **P1**. Write down your raw data and calculated data in the following table and then draw the transfer function in the log-log scale. Please indicate the 3 dB point on your plot. Is it in a good agreement with what you calculated from R and C?

f (Hz)											
V_{out} (mV)											
V_{out}/V_{in}											

2. Do **P2**. Write down your raw data and calculated data in the following table and then draw the transfer function in the log-log scale. Please indicate the 3 dB point on your plot. Is it in a good agreement with what you calculated from R and C?

f (Hz)											
V_{out} (mV)											
V_{out}/V_{in}											

3. What did you see on the oscilloscope when you change the frequency of the signal? Qualitatively draw graphs at f = 100 Hz, f = 1 kHz, f = 10 kHz of square wave. Explain why they look different.

4. Attach your LabVIEW measurement print-outs for high-pass filter and low-pass filter. Compare it with your manual plots. Are they in a good agreement in terms of shapes, amplitudes and 3 dB points? If not, try to explain the reason. What are the advantages you think of using LabVIEW rather than doing it manually?

5. Construct the RLC filter and connect the multimeter across the resistor. Using prelab values, note down the resonant frequency, the quality factor, Q, and the width of the passband?

6. Use LabView to plot the frequency response, sampling at 5 steps / decade. Find the half-power frequencies by stretching the graph. What are the 2 half-power frequencies, and what is the width of the passband?
Are your findings consistent with the equation relating quality factor, bandwidth and resonant frequency? Explain.