**Part 1:**
1) Build the filter shown below. Is it a high pass or low pass filter?
2) Calculate the filter's $f_{3\text{dB}}$ frequency.
3) Measure the $f_{3\text{dB}}$ frequency. This is the frequency where $\frac{V_{\text{out}}}{V_{\text{in}}} = 0.707$. Compare it to the calculated $f_{3\text{dB}}$ point.
4) Using the measured $f_{3\text{dB}}$ frequency, measure $V_{\text{out}}$ and $V_{\text{in}}$, at the following frequencies: $f_{3\text{dB}}/2$, $2f_{3\text{dB}}$, $3f_{3\text{dB}}$, $4f_{3\text{dB}}$, $8f_{3\text{dB}}$ and $10f_{3\text{dB}}$. Then make a plot of $\frac{V_{\text{out}}}{V_{\text{in}}}$ vs. frequency (include the measurement of $f_{3\text{dB}}$). Print this out twice. Once with a regular scale, and once with a log-log scale.
5) Measure the phase shift when $f << f_{3\text{dB}}$, $f = f_{3\text{dB}}$ and $f >> f_{3\text{dB}}$. Recall $\phi = 2\pi \frac{\Delta t}{T} = 2\pi tf$ so if you measure the shift in time, $\Delta t$ you should be able to calculate the phase in radians or degrees. Does the output Lead or Lag the input in each case?

**Part 2:**
1) Build the filter shown at the right. Is it a high pass or low pass filter?
2) Calculate the filter's $f_{3\text{dB}}$ frequency.
3) Measure the $f_{3\text{dB}}$ point. This is the frequency where $\frac{V_{\text{out}}}{V_{\text{in}}} = 0.707$. Compare it to the calculated $f_{3\text{dB}}$ point.
4) Using the measured $f_{3\text{dB}}$ point, measure $V_{\text{out}}$ and $V_{\text{in}}$, at the following frequencies: $2f_{3\text{dB}}$, $f_{3\text{dB}}/2$, $f_{3\text{dB}}/3$, $f_{3\text{dB}}/4$, $f_{3\text{dB}}/8$ and $f_{3\text{dB}}/10$. Then make a plot of $\frac{V_{\text{out}}}{V_{\text{in}}}$ vs. frequency. Print this out twice, once with a regular scale, and once with a log-log scale.
5) Measure the phase shift for $f << f_{3\text{dB}}$, $f = f_{3\text{dB}}$ and $f >> f_{3\text{dB}}$. Does the output Lead or Lag the input in each case?