The purpose of this laboratory is to become familiar with Digilent's Electronics Explorer board and its related software WaveForms.

Pre-Lab:

Read the following documents from the class web page:

1. Electronics Laboratory Basic Information
2. Electronics Explorer Data Sheet
3. Getting Started with Electronics Explorer (click on the "Digilent's WaveForms Help" link)
4. Getting Started with Wave-Forms
5. Get a notebook
6. Find out the values of R1 and R2 needed for part A of the Lab.
   (make sure the values are available in your kit)
7. Find out the values of R and C for part B of the Lab.
   (make sure the values are available in your kit)
8. Be ready for a quiz on the topics covered by the Lab.

Lab. - Part A

Design a simple voltage divider that provides an output voltage Vo = 3.33 V. The desired current issued by the supply must be 1.67mA.

1. The value of the supply voltage is VP = _____
2. The value of R1 = _____
3. The value of R2 = _____ (Take the output voltage across R2)
4. Is the value of output voltage matching your expectation? _____
5. What is the % relative error of the output voltage? _____
6. Attach a screenshot of your measurements

Lab. - Part B

Design a simple first order RC Low Pass Filter. The input signal applied to the filter is a square waveform of 1V amplitude and 1KHz frequency. The desired time constant of the filter is τ =1ms.
Use the Digilent's Arbitrary Waveform Generator to set the input signal and the Oscilloscope to track the output signal.

1. The value of R = _____
2. The value of C = _____
3. Attach a screen shot of the output signal. Does the waveform match your expectation? _____
4. To measure the effective time constant of the filter, use the sweep feature of the network analyzer (i.e., plot the frequency response of the filter) and measure the 3dB cut off frequency fc of the filter.
5. The value of fc = _____
6. The value of τ = _____
7. What is the % relative error of the time constant? _____
8. Change the signal applied at the input of the filter into a sine wave of 1V amplitude and 10 KHz.
9. What is the measured amplitude of the output voltage? _____
10. What is the theoretical amplitude of the output voltage? _____
11. Attach a screenshot of the output signal