Lab experiment: RC circuits

This is your first experiment with the lab equipment, breadboard and basic components like resistors and capacitors. While the circuits are simple to analyze, the emphasis is more on using the lab equipment and measurement.

1. Connect the RC circuit shown in Fig.1. Note: R=1KΩ and C=1μF

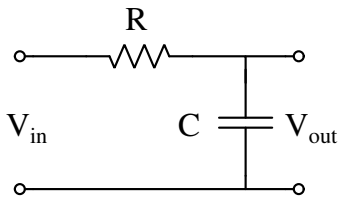

Figure 1: RC circuit-1

2. Apply a square wave input of $10V_{PP}$ and $100Hz$ that varies from -5V to +5V.
3. Observe the input and output waveforms for 100Hz, 1kHz, 10kHz, and 100kHz.
4. Take the pictures of waveforms on DSO for 100Hz, 1kHz, 10kHz, and 100kHz. You may need in the report.
5. Explain your observations.
6. Now add a DC offset of +5V so that V_{in} varies from 0 to 10V.
7. Observe the input and output waveforms for 100Hz, 1kHz, 10kHz, and 100kHz.
8. Change the duty cycle of the input voltage to 10 % and observe the input output waveforms.
9. Modify the circuit as shown in Fig.2. and repeat the steps 1 to 10 for this circuit.
10. Explain your observations.

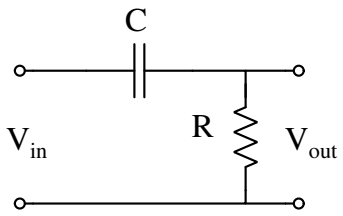

Figure 2: RC circuit-2