**Experiment 22**: RC Transients

(Edit this document as needed)

Partner 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Partner 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Part A*

Include image of your Oscilloscope plots

*Part B*

What values of C1 and C2 did you pick? C1: \_\_\_\_\_\_\_\_\_\_ C2: \_\_\_\_\_\_\_\_\_

What is the value of Rdischarge so that the time constant is about 10 seconds? \_\_\_\_\_\_\_\_\_\_

Data Logger plot of discharge voltage of two capacitors for 40 seconds.

Fill in the table of your measured voltages at times starting from when you disconnected the source. (Note: The calculated voltage is  .

|  |  |  |
| --- | --- | --- |
| Time [s] | Measured Voltage [V] | Calculated Voltage [V] |
| 0 |  |  |
| 3 |  |  |
| 6 |  |  |
| 9 |  |  |
| 12 |  |  |
| 15 |  |  |
| 18 |  |  |
| 21 |  |  |
| 24 |  |  |
| 27 |  |  |
| 30 |  |  |

Matlab plots of Measured Voltage vs. time and Calculated Voltage vs. time, with annotations.

Are the plots roughly the same or are the any differences of note?

Plots when disconnecting, discharging and reconnecting one of the capacitors? Add annotations to your plot explaining what you see.

Explain what happened when you reconnected the discharged capacitor. What do you think happened?

Plots when disconnecting and reconnecting (without discharging) one of the capacitors? Add annotations to your plot explaining what you see.

Explain what happened when you reconnected the capacitor. What do you think happened?

Plots of the capacitor voltage when the source is a square wave (Pulse)

Due: April 11th, 2022 at 11:59 pm eastern on Gradescope

One student submits on Gradescope and adds their partner using “add group members” option on Gradescope.