1 Objective

The objective is to measure the time constant of an RC circuit in order to verify the calculated values [1].

2 Equipment Used

- Digital Multimeter
- DC Power Supply
- Resistor: $20k\Omega$
- Capacitor: $2,200\mu$F
- Alligator (Clips) Jumper

3 Experiment Setup

1. Construct the circuit in Figure 10-1[1].

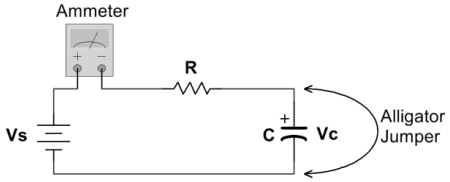

Figure 10-1 Series RC Circuit for Experimental Setup [1]

2. Measure the initial current [1].
3. Calculate the values of τ and 5τ in which τ is equal to R_{eq} times C_{eq} [1].
4. Collect data by timing the measurements of the current to ever 15 seconds and in order to measure the current remove the alligator clip from the circuit [1].
5. Take measurements every 15 seconds until 5τ and possibly further [1].
6. Repeat the previous 2 steps for trial 2 [1].
7. Take the average values of the two trials at each measured time [1].
8. Use the average current to calculate the voltage across the resistor [1].
9. Solve the voltage across the capacitor, V_c, which can be solved fro with the voltage accross the resistor $V_c = (V_s$ - $V_R)$ [1].

4 Results

τ = Initial Current =
5τ =

Table 10-1: Data Table for RC Time Constant [1]

Time (min:sec)	Current (mA)			Resistor Voltage (V)	Capacitor Voltage (V)
	Trial 1	Trial 2	Average		
0:00					
0:15					
0:30					
0:45					
1:00					
1:15					
1:30					
1:45					
2:00					
2:15					
2:30					
2:45					
3:00					
3:15					
3:30					
3:45					
4:00					
4:15					
4:30					
4:45					
5:00					
5:15					
5:30					
5:45					
6:00					

5 Conclusion

References

[1] UNCC ECE Department. Time constant of an rc circuit, 2023. [Online; accessed 21 November 2023].