

Lab 7

Storage Devices and RC Circuits

ELEN 50 Lab: Electric Circuits I

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Submitted

At



By:

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Table 4- Time Constant Measurements			
R(Ω)	Theoretical (Meas. R)	Measured	Percent Error (%)
200	0.0003	2.80E-04	-6.67%
400	0.0006	5.80E-04	-3.33%
600	0.0009	8.80E-04	-2.22%
800	0.0012	1.19E-03	-0.83%
1k	0.0015	1.44E-03	-4.00%
1.2k	0.0018	1.80E-03	0.00%

This circuit took us a long time to figure out, as we had initially messed up our circuit and then our wavelength generator values. Due to initial circuit errors, we had our first value a lot larger than we would've liked which is why we modified our circuit to get better further percent errors.

This further proves our general equations for tau and the relationship between resistance and capacitor. The higher our resistance values were the lower our percent errors were.

Table 5 - Resistance and Capacitance Values				
	R1 (k Ω)	R2 (k Ω)	R3 (k Ω)	C1 (μ F)
<i>Nominal Values</i>	1.2	2.2	2.7	3.3e-6
<i>Measured Values</i>	1.18969	2.2055	2.6911	4.4e-6

Table 6- Time Constant Measurements			
$R(\Omega)$	Theoretical (Meas. R)	Measured	Percent Error (%)
$V_c(\tau)(V)$	0.378744	0.39375	3.96%
τ (ms)	5.533	6.18	11.69%

We had a slight discrepancy on our last percent measurement as a percent value was very high. This might be attributed to misuse of the oscilloscope, not being precise enough with the measurement cursors.

We can find from our results that the theoretical value was very different from our measured values and this leads us to believe that we had the inaccurate calculations on matlab when it was truly inaccurate use of the digital oscilloscope.