Lab 14 – RC Time Constant Lab

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The purpose of this lab is to:

Experiment with RC (Resistor & Capacitor) circuits.

The following capacitors are needed (1 each of the following): 0.22uF, 0.1uF and 0.068uF and 1Kohm resistor.

Measure and record the resistor value using the DMM and measure and record the capacitor values using the LCR meter in Table 1. Connect the resistor and capacitor as shown in Figure 1. Connect the Function Generator to the input at V1 and connect Channel 1 of the Oscilloscope to the input (Vin) and Channel 2 to the output (Vout). Adjust the voltage of the Function Generator to 1V square wave and 1Hz frequency.



Figure 1

**RC Circuit**

Table 1 – Resistance and Capacitor values

|  |  |  |  |
| --- | --- | --- | --- |
|  | Expected | Measured | Simulated |
| R1 = | 1kΩ | 989.2Ω | 1kΩ |
| C1 = | 47uF | 39.82uF | 47uF |
| 1 = | 0.632121V | 0.6323V | 0.615240V |
| 2 = | 0.864665V | 0.8455V | 0.856450V |
| 3 = | 0.950213V | 0.9315V | 0.950798V |
| 4 = | 0.981684V | 0.9675V | 0.986245V |
| 5 = | 0.993262V | 0.9813V | 0.994842V |

Expected = value you expect it to be

Measured = using LCR Meter or DMM

Simulated – value used in Multisim

Equipment needed:

1 – Digital Multimeter

1 – LCR Meter

1 – Oscilloscope

1 – Function Generator

1 – Elvis II

1 – 47 uF capacitor

1 – 1Kohm resistor

Observations:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_