Lab 10 – Series/Parallel Capacitors

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The purpose of this lab is to:

Experiment with series circuits and parallel combinations of capacitors.

The following capacitors are needed (1 each of the following): 10uF, 22uF and 47uF

Measure and record the capacitance of each capacitor using the LCR meter. Connect the capacitors as shown in Figure 1 and measure and record the total capacitance, CT. Then connect the capacitors as shown in Figure 2 and measure and record the total capacitance, CT.

Equipment needed:

1 – LCR Meter



Figure 1

**Series Circuit**

1 – Elvis II

3 – capacitors

|  |  |  |  |
| --- | --- | --- | --- |
|  | Expected | Measured | Simulated |
| C1 = | 10uF | 9.3uF | 9.3uF |
| C2 = | 22uF | 19uF | 19uF |
| C3 = | 47uF | 38uF | 38uF |
| CT = | 6.0uF | 5.3uF | 5.99768uF |

Expected = value you expect it to be

Measured = using LCR Meter

Simulated = using Multisim



Figure 2

**Parallel Circuit**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Expected | Measured | Simulated |
| C1 = | 10uF | 9.3uF | 9.3uF |
| C2 = | 22uF | 19uF | 19uF |
| C3 = | 47uF | 38uF | 38uF |
| CT = | 79uF | 65uF | 79uF |

Expected = value you expect it to be

Measured = using LCR Meter

Simulated = using Multisim

Observations: The first LCR meter I tried to use did not give reasonable values. The second one I tried (and ultimately used) gave more reasonable values, but they were always significantly below the expected values. The meter likely needs to be calibrated, though it’s also possible all the parts I used really were a good amount under their rating.