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 = | 10µF | 8.142µF | 10µF |
| C2 = | 22µF | 18.974µF | 22µF |
| C3 = | 47µF | 37.655µF | 47µF |
| CT = | 5.998µF | 4.930µF | 5.9987µF |

Expected = value you expect it to be

Measured = using LCR Meter

Simulated = using Multisim



Figure 2

**Parallel Circuit**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Expected | Measured | Simulated |
| C1 = | 10µF | 8.142µF | 10µF |
| C2 = | 22µF | 18.974µF | 22µF |
| C3 = | 47µF | 37.655µF | 47µF |
| CT = | 79.000µF | 64.821µF | 79.000µF |

Expected = value you expect it to be

Measured = using LCR Meter

Simulated = using Multisim

Observations: Capacitors in series combine the same way resistors combine in parallel, and capacitors in parallel combine the way resistors combine in series.