# Lab 3: Capacitors in Series and Parallel

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# 1 Purpose

The purpose of this lab is to gain a working understanding of the real-world behavior of capacitors, and experimentally finding the equivalent capacitance of various combinations of series and parallel capacitors.

# 2 Theory

# 3 Experiment Analysis

# 4 Procedure

## 4.1 Measurement of Capacitance Using a Multi-Meter

## 4.2 Measurement of Equivalent Capacitance in Series

## 4.3 Measurement of Equivalent Capacitance in Parallel

## 4.4 Measurement of Equivalent Capacitance for Both Series and Parallel

# 5 Data and Graphs

## 5.1 Part 1

## 5.2 Part 2

## 5.3 Part 3

# 6 Calculations and Results

## 6.1 Part 1

## 6.2 Part 2

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## 6.3 Part 3

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## 6.4 Part 4

## 6.5 Part 5

## 6.6 Part 6

# 7 Questions

## 7.1 Circuit 1

## 7.2 Circuit 2

$$\left(\frac{1}{0.75\mu F + 15\mu F} + \frac{1}{1.5\mu F}\right)^{-1} + \left(\frac{1}{3.5\mu F} + \frac{1}{5\mu F}\right)^{-1} + 8\mu F = 11.4\mu F$$

# 8 Conclusion