

EXPERIMENT 1: CAPACITOR**Course Learning Outcome:**

Solve problems of electric current, **electronics**, magnetism, optics, quantization of light, wave properties of particles and nuclear physics.

(C4, PLO 4, CTPS 3, MQF LOD 6)

Learning Outcomes:

At the end of this lesson, students will be able to explain the experiment to

- determine the time constant of an RC circuit.
- determine the capacitance of a capacitor using an RC circuit

Student Learning Time:

Face-to-face	Non face-to-face
1 hour	1 hour

Direction: Read over the lab manual and then answer the following question.

Introduction

- Figure below shows a capacitor.



- What is the function of capacitor?
.....
 - What is meant by 1000 μF ?
.....
- 'Time constant, τ is a measurement of how fast the capacitor charges or discharges'.
 - What is meant by time constant for current during discharging process?
.....
.....
 - What is the relationship between time constant, τ , resistance, R and capacitance, C.
.....
 - During charging and discharging process what is the different in terms of their time constant.
.....

Updated: 07022018

Experiment

4. Sketch and label the circuit diagram of the experiment?

5. From this experiment, identify
 - a. the manipulated variable,
.....
 - b. the responding variable
.....
6. During the experiment, why we need to short circuit the capacitor when measure time t of discharging process?
.....
7. Which circuit combination will discharge faster? Explain your answer.
.....

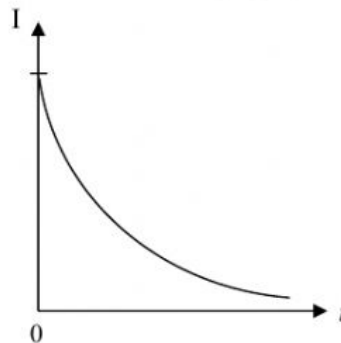
Data Analysis

8. Two capacitors, C_1 and C_2 can be connected either in series or parallel. Write the formula of effective capacitance for both combinations.

Series :

Parallel :

9. The graph shows the current, I versus time, t for discharging capacitors.



Updated: 07022018

a. How to determine time constant, τ from the graph.

b. What is the physical meaning of I when $t = 0$.

.....

c. For the capacitance in parallel combination C_1 and C_2 , how do we determine the capacitance, C_2 .

10. Why micro ammeter is used instead of ammeter in the experiment?

.....

11. Why large resistance is used in the experiment?

.....

