

Name:

Class:

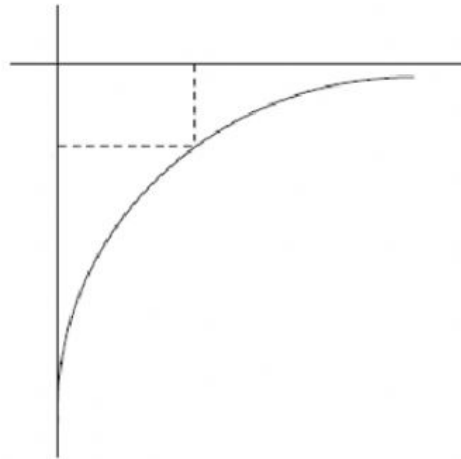
Experiment 4: Capacitor

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

- a) State the objective of the experiment.
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- b) Identify the variables of the experiment.
 Manipulated variable :
 Responding variable :
 Constant variable :
- c) Theory:
 Time constant is a measurement of how fast capacitor to charges or discharges.
- i) What is meant by time constant for current during discharging process of a capacitor?

- ii) What is the symbol and unit for time constant?
 Symbol:..... unit:.....
- iii) What is the relationship between the time constant, τ , resistance, R and capacitance, C?

- iv) The following graph is the graph of magnitude of current, I against time, t during the discharging process of a capacitor. Label the graph and chose related equation.



The magnitude of the discharge current is given by

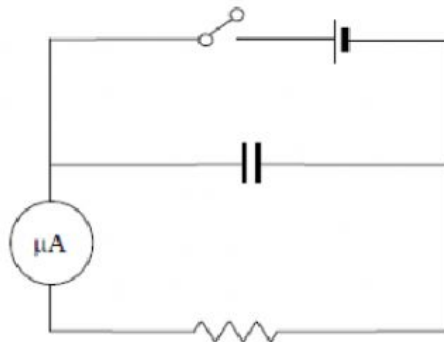
☐ $Q = Q_0(1 - e^{-\frac{t}{\tau}})$

☐ $I = I_0 e^{-\frac{t}{\tau}}$

☐ $Q = Q_0 e^{-\frac{t}{\tau}}$

- d) Procedures:

- i) Label the apparatus from schematic diagram of the experiment.



- ii) What is the first thing you need to record?

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- iii) How you make sure the capacitor is fully discharged?

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e) Data tabulation and analysis.

i) Construct appropriate tables for data collection.

ii) What graph do you need to plot for this experiment?

The graph of _____ against _____.

iii) How do you determine the experimental value for this experiment?

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iv) How do you calculate the theoretical value for this experiment?

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