

# Capacitor Energy Lab

## Procedure

Briefly, but completely, describe the procedure for this lab – and include labeled sketches.

## Data

Part I       $V =$  \_\_\_\_\_       $I =$  \_\_\_\_\_       $t =$  \_\_\_\_\_

Part II

Trial	V	# Rot	E
1			
2			
3			
4			
5			
6			
7			

Part III

	V	# Rot	E
Parallel			
Series			

## Graphs

Graph voltage versus energy for Part II only. Figure out which variable is your independent and which is dependent. Your first graph should NOT be linear. Figure out what the relationship is between voltage and energy, and determine how to linearize your data. Make a second, linear graph. Draw the best fits line for the linear graph only.

## Questions

- 1) Use the data in Part I to calculate the amount of energy per rotation for the Genecon. Show all of your work. Draw one circuit diagram for this part, but include a voltmeter and ammeter at the same time (even though you did these readings separately).
- 2) Find the slope of your best fits line – including units. Use your slope, along with actual formulas, to find your experimental value for the capacitance. Show your work.
- 3) The capacitor is supposed to be 1 F. Use this value, along with your experimental value for capacitance, to find your percent error for this lab.
- 4) Discuss your observations from Part III. Specifically, how does the energy storage change, if at all, for the single capacitor versus when two capacitors are hooked up in parallel or series? Include a circuit diagram for each capacitor arrangement and calculate the effective capacitance of each circuit. Be thorough and detailed – and feel free to use some math here!

## Error Analysis

Thoroughly explain what the main sources of error are for this lab, and how you would correct them.