Prelab /10 **555 Timer Lab** Date:
Post Lab /20 Name(s):

Total /30

**Important Dates:**

Lab day (prelab will be due): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
Formal lab write up: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Your Job:**

You will be given a package of electrical components. Your job is to discover how the resistance of R1, R2, and the capacitance of C1 affect the period (length of time between the pulses of light) and high time (length of time the light is on). Record your data then graph it. Using the slopes of the straightened graphs, determine the relationship between the components and the circuit.

**Prelab:**

* Purpose - write a purpose statement in the format (To determine...)
* Predictions
	+ If we increase the resistance of R1 what will happen to the period and high time?
	+ If we increase the resistance of R2 what will happen to the period and high time?
	+ If we increase the capacitance of C1 what will happen to the period and high time?

**Procedure:**

1. Organise the resistors and capacitors in order of resistance and capacitance. Put the values into the table below.
2. Assemble the 555 astable circuit on the breadboard using the schematic provided. This assembly configuration will be your control. Be careful -one misplaced wire could destroy the whole IC.
3. Replace R1 with another resistor and record the length of period and length of high time generated.
4. Repeat step 3 until all of the R1’s have been tested, then restore the circuit to its control assembly configuration.
5. Repeat steps 3 and 4 for R2 and C1
6. Create a graph for R1 of resistance vs. length of the period and length of high time and then repeat for R2 and C1 .
7. Figure out the line of best fit by using a graphing calculator (Ben will show you how)
8. Describe the relationship between the variables that can be shown in each graph.
9. Explain why you got the results that you did.

**Data table:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| R1 | R2 | C1 | Average Length of Period (s) | Average Length of High time (s) |
| Trial1 | Trail 2 | Trail 3 | Average | Trial1 | Trail 2 | Trail 3 | Average |
| 1 | 1 | 1 |  |  |  |  |  |  |  |  |
| 2 | 1 | 1 |  |  |  |  |  |  |  |  |
| 3 | 1 | 1 |  |  |  |  |  |  |  |  |
| 4 | 1 | 1 |  |  |  |  |  |  |  |  |
| 5 | 1 | 1 |  |  |  |  |  |  |  |  |
| 1 | 2 | 1 |  |  |  |  |  |  |  |  |
| 1 | 3 | 1 |  |  |  |  |  |  |  |  |
| 1 | 4 | 1 |  |  |  |  |  |  |  |  |
| 1 | 5 | 1 |  |  |  |  |  |  |  |  |
| 1 | 1 | 2 |  |  |  |  |  |  |  |  |
| 1 | 1 | 3 |  |  |  |  |  |  |  |  |
| 1 | 1 | 4 |  |  |  |  |  |  |  |  |
| 1 | 1 | 5 |  |  |  |  |  |  |  |  |



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