

**SINCLAIR COMMUNITY COLLEGE**

**Electronics Engineering Technology Department**

**EET 101**

**LAB #1: Ohm's Law**

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Data Tables:

**DATA TABLE A: Resistor Values**

Resistor ID	Nominal Value	Measured Value
R1	1 k $\Omega$	0.988 k $\Omega$
R2	1.2 k $\Omega$	1.19 k $\Omega$
R3	2 k $\Omega$	2.04 k $\Omega$
R4	3.3 k $\Omega$	3.34 k $\Omega$
R5	4.7 k $\Omega$	4.66 k $\Omega$

**DATA TABLE B: Current Through R1 for Different Voltages**

Voltage	Current through R1		
	Predicted	Measured	% Error
5.00 V	5.00 mA	4.87 mA	2.60 %
10.0 V	10.0 mA	9.89 mA	1.10 %
15.0 V	15.0 mA	15.4 mA	2.67 %
20.0 V	20.0 mA	19.4 mA	2.50 %

**DATA TABLE C: Values of Current at 10 V with Different Resistors**

Resistor	Current at 10.0 V		
	Predicted	Measured	% Error
R2	8.33 mA	8.37 mA	0.480 %
R3	5.00 mA	4.87 mA	2.60 %
R4	3.03 mA	3.00 mA	0.990 %
R5	2.13 mA	2.17 mA	1.88 %

Answers to Lab Questions:

1. *How does current change as resistance increases at a fixed voltage?*

From Data Table 3 we see that current decreases as resistance is increased at a fixed voltage. The current had its maximum value (8.37 mA) when the resistance was smallest (1.2 k $\Omega$ ), and it became proportionately smaller as the resistance increased.

Technical Conclusion:

From the data in Data Table B, we see that with a fixed resistance, current is approximately proportional to voltage. Going down the rows of the table, voltage increases, and so does current. Also, although our data do not all satisfy the equation  $I = V/R$  precisely, they do all satisfy the equation to within about 2.7 %.

From the data in Data Table C, we see that with a fixed voltage, current is approximately inversely proportional to resistance. Going down the rows of the table, resistance increases, and current decreases. Again, although our data do not all satisfy the equation  $I = V/R$  precisely, they do all satisfy the equation to within about 2.6 %.

Thus, since all percentage errors are well within the range that one would expect with 5% tolerance resistors, we conclude that our data do verify Ohm's law.