

United International University

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Section: PHY 106 (A) Batch: 192 Date: 28-July-2021

Experiment No. 01

Name of the Experiment: Verification of the Ohm's law.

Objective:

To verify the following two equivalent forms of Ohm's Law:

- a. Express I as a function of V and R
- b. Express V as a function of I and R

Theory:

Ohm's law states that the current flowing in a circuit is directly proportional to the applied potential difference and inversely proportional to the resistance in the circuit. In other words, by doubling the voltage across a circuit the current will also double.

Formula for voltage:

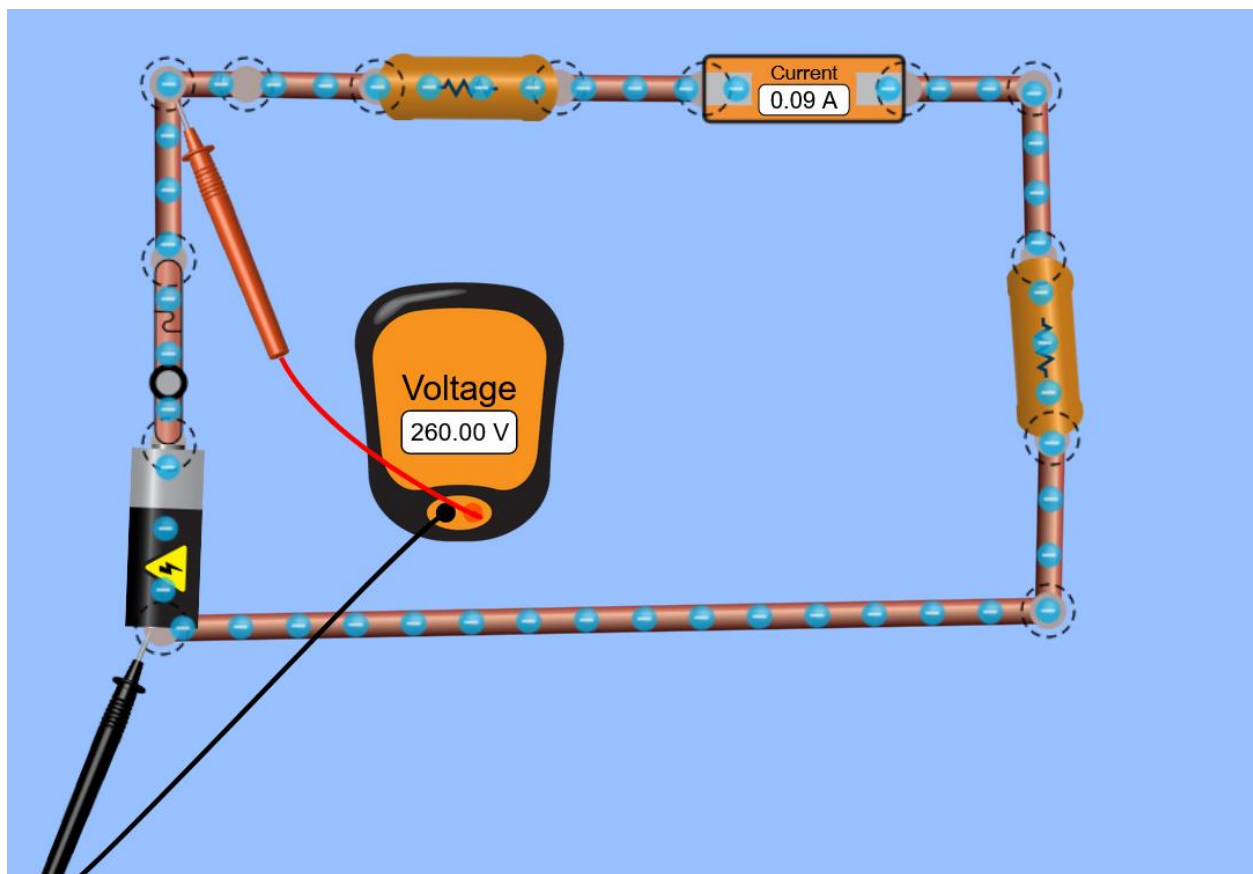
For a constant value of R , V is directly proportional to I i.e., $V = IR$.

Formula for current:

For a constant value of V , current(I) is inversely proportional to resistance(R). i.e., $I = V/R$.

Equipment:

- Variable DC power supply -1 piece
- Voltmeter- 1 piece
- Ammeter – 1 piece
- Resistors
- Connecting wires

Circuit Diagram:

Data Sheet:

Table: Current versus voltage

Supply Voltage(V)	Measured by using Ammeter(A)	$R_T = R_{1K} + R_{2.4K}$ [Use measured values of R]	Calculate I (amp) $I = V/R_T$
50	0.01	2400	0.0208
100	0.02	2400	0.0417
140	0.03	2400	0.0583
250	0.05	2400	0.1042
340	0.07	2400	0.1417

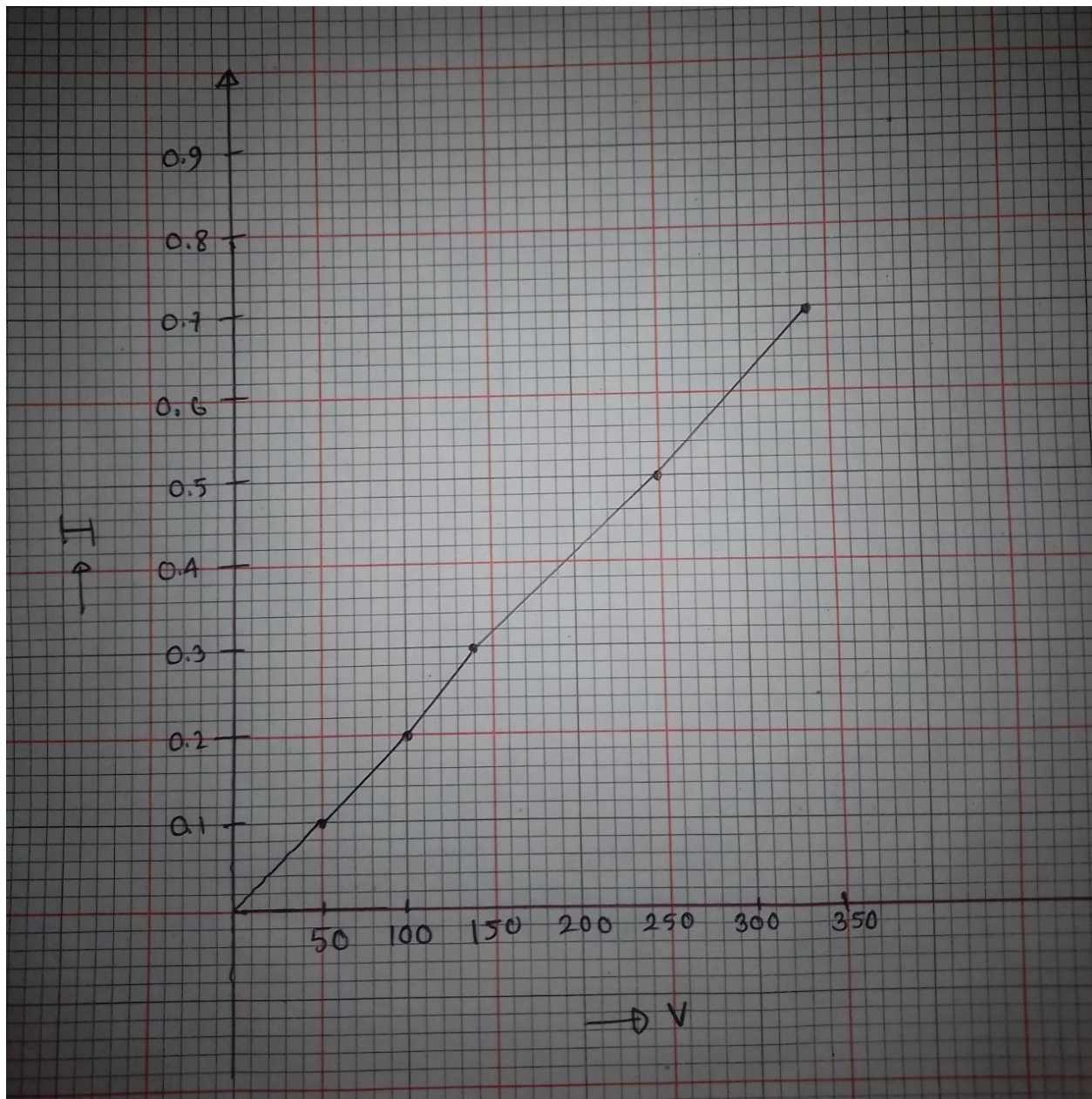
Table: Current versus resistance

Supply Voltage(V)	Measured by using Ammeter(A)	R_T (Ω) Use measured values of R	Calculate $R_T = V/I$ (Ω)
260	0.09	1000+1800=2800	2888
260	0.08	1000+2300=3300	3250
260	0.07	1000+2800=3800	3714
260	0.06	1000+3300=4300	4
260	0.04	1000+4100=5100	5500

Assignments:

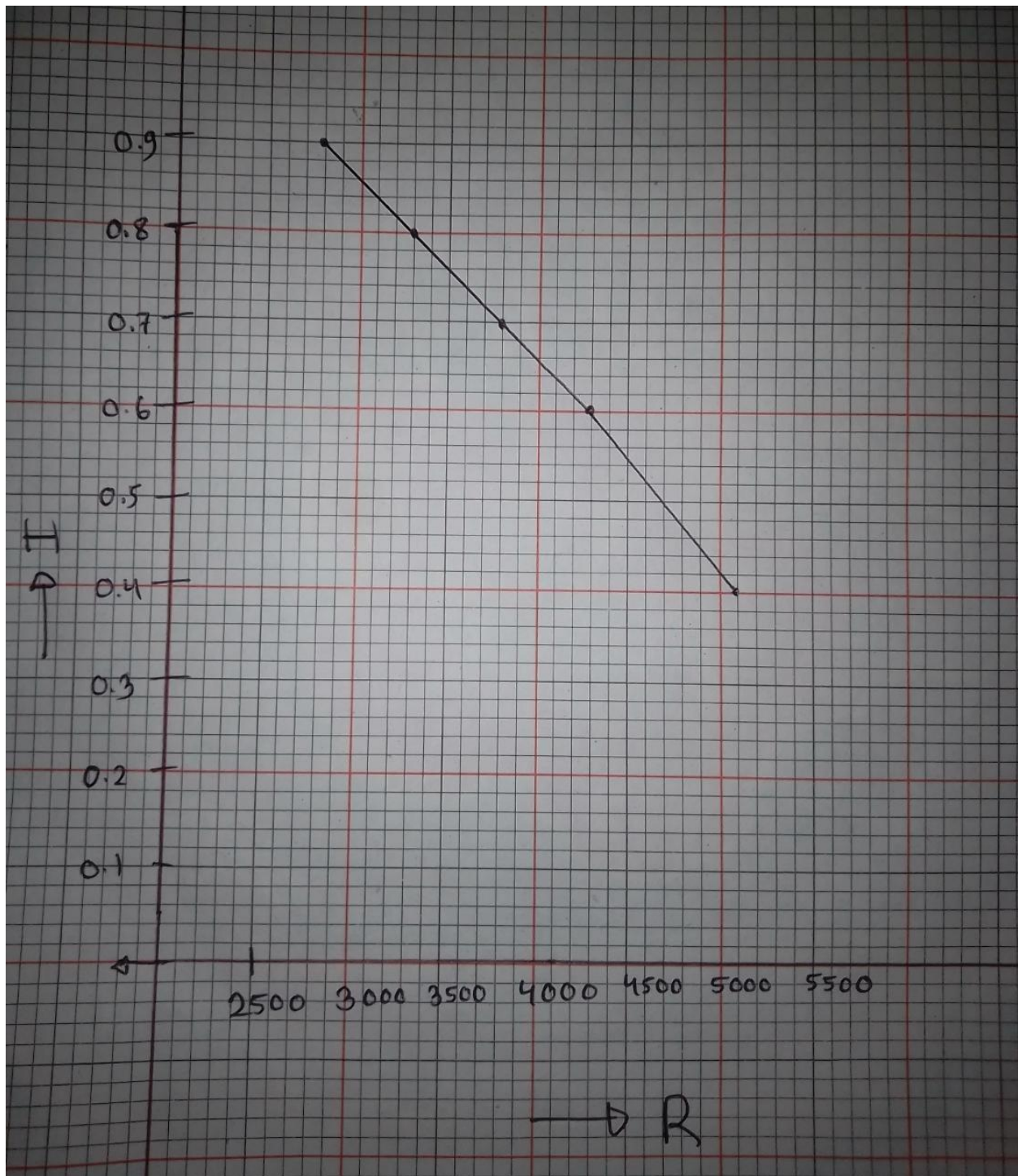
1. From the graph of I vs V, we can see that if we keep the value of the resistance constant, I will be proportional to Voltage V. So if the voltage is increased the current is also increased if it is reduced the current is reduced.

2. When the resistors remain constant, using measured value a graph of Current (I) vs voltage (V) is plotted below:



Here, from the graph we can clearly see that I is increasing when the value of the V increases. It proves that I is directly proportional to V

3. When the value of the voltage(V) remains constant, using measured value a graph of (I vs R_t) is plotted below:



From the graph we can clearly see that I is increasing when the value of R decreases.

It proves I is inversely proportional to R .