AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH (AIUB)
Faculty of Engineering
Department of EEE and CoE
Undergraduate Program

American International University-Bangladesh (AIUB)

Course: Introduction To Electric Circuit **Exp No:01** **Fall :2021**

Title: Familiarizing with the basic DC circuit terms & concepts: Introduction to laboratory equipment.

Submitted by

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Introduction:

The main objective of this experiment was to verify the ohms law. In doing so, followings were performed:

a) To design an electrical circuit with relevant parameters and sources.
b) To set up the circuit with appropriate connections, sources, and instruments.
c) To compare the measured value with the theoretical estimated value.
d) To find the reason for error in result, and to draw conclusion on how to overcome

Ohm's Law: Ohm's Law deals with the relationship between voltage and current in an ideal conductor. This relationship states that: At fixed temperature in an electrical circuit, the current passing through a conductor
between two points is proportional to the potential difference (i.e. voltage drop or voltage) across the two points,
and inversely proportional to the resistance between them. In mathematical terms, this is written as:

$$V = IR$$

Where I is the current in amperes, V is the potential difference in volts and R is a constant measured in ohm's,
called the resistor.The potential difference is also known as the voltage drop and is sometime denoted by E or U instead of V.

Current: The amount of electric current through some surface, a section through a copper conductor, is defined as the amount
of electric charge flowing through that surface over time. If Q is the amount of charge that passed through the surface in the time T,
then the average current I is :

$$I=Q/T$$

Voltage: Voltage is the difference of electrical potential between two points of an electrical or electronics circuit, express in volts.
It measures the potential energy of an electric field to cause an electric current in an electrical conductor. Depending on the difference
of electrical potential it is called extra low voltage, low voltage, high voltage, extra high voltage.

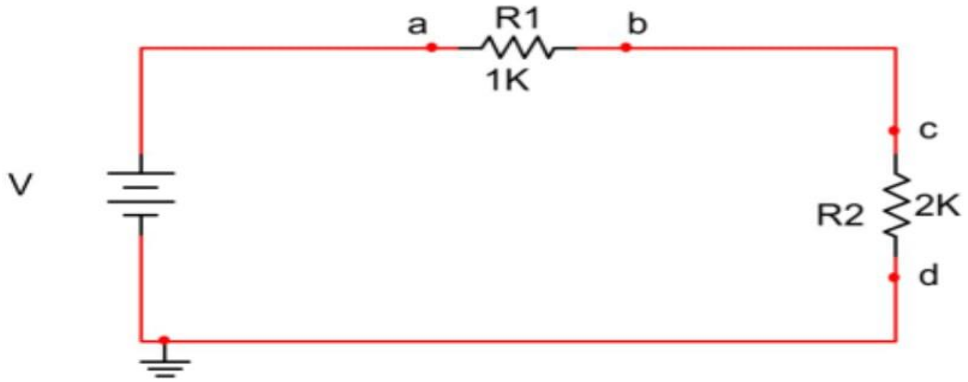
Ammeter: Ammeter is a device that is used to measure the current level of the circuit.

Voltmeter: Voltmeter is a device that is used to measure the voltage difference between two points. The potential difference can be
measured by simply connecting the leads of the across the two points.

Apparatus:

SI. No	Name	Rating	Quantity
1.	Trainer Board		1
2.	Voltmeter		2
3.	Ammeter		1
4.	AVO Meter or Multi Meter		2
5.	DC Source	5V, 10V	1
6.	Resistors	1KOhm	2

Circuit Diagram:



Simulation & Result:

Color	1st dig(X)	2nd dig(Y)	Mult	Tolerance
Black	0	0	XY.0 ohm	
Brown	1	1	XY0 ohm	
Red	2	2	X.Y K ohm	
Orange	3	3	XY K ohm	
Yellow	4	4	XY0 Kohm	
Green	5	5	X.Y M ohm	
Blue	6	6	XY M ohm	
Violet	7	7	XY0 M ohm	
Gray	8	8	X.Y G ohm	
White	9	9	XY G ohm	
Gold			X.Y ohm	5%
Silver			0.XY ohm	10%
None				20%

Figure 3: Numerical values of different colors used in resistors

Resistor	Value using color code chart
R1	39000 +/- 1950 Ohm
R2	47 +/- 2.35 Ohm
R3	1500 +/- 75 Ohm
R4	100 +/- 5 Ohm
R5	2200 +/- 110 Ohm
R6	47000 +/- 2350 Ohm

1) Orange – 3
White – 9
Orange – 3
Gold – 5% tolarence

Resistance = $\{(1st\ digit \times 10) + 2nd\ digit\} \times 10^{3rd\ digit} \pm$ tolarence

$= \{(3 \times 10) + 9\} \times 10^3 \pm 5\%$

$= 39000 \pm 1950\ \Omega$

2) Yellow – 4
Violet – 7
Black – 0
Gold – 5% tolarence

Resistance = $\{(4 \times 10) + 7\} \times 10^0 \pm 5\%$

$= 47 \pm 2.35\ \Omega$

3) Brown – 1
Green – 5
Red – 2
Gold – 5% tolarence

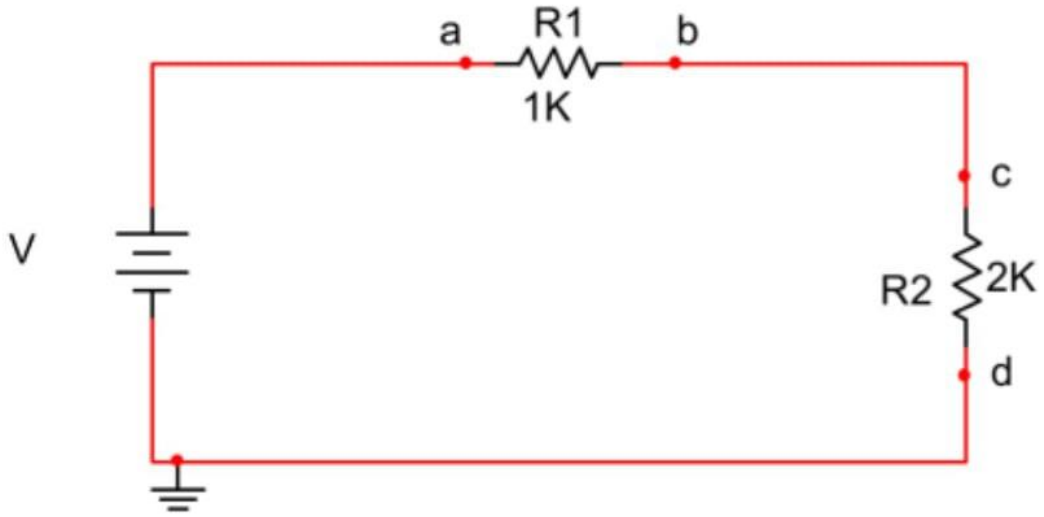
Resistance = $\{(1 \times 10) + 5\} \times 10^2 \pm 5\%$

$= 1500 \pm 75\ \Omega$

4) Brown - 1
Black - 0
Brown - 1
Gold - 5% tolarence
Resistance = $\{(1\times10)+0\}\times10^1 \pm 5\%$
$= 100 \pm 5\ \Omega$

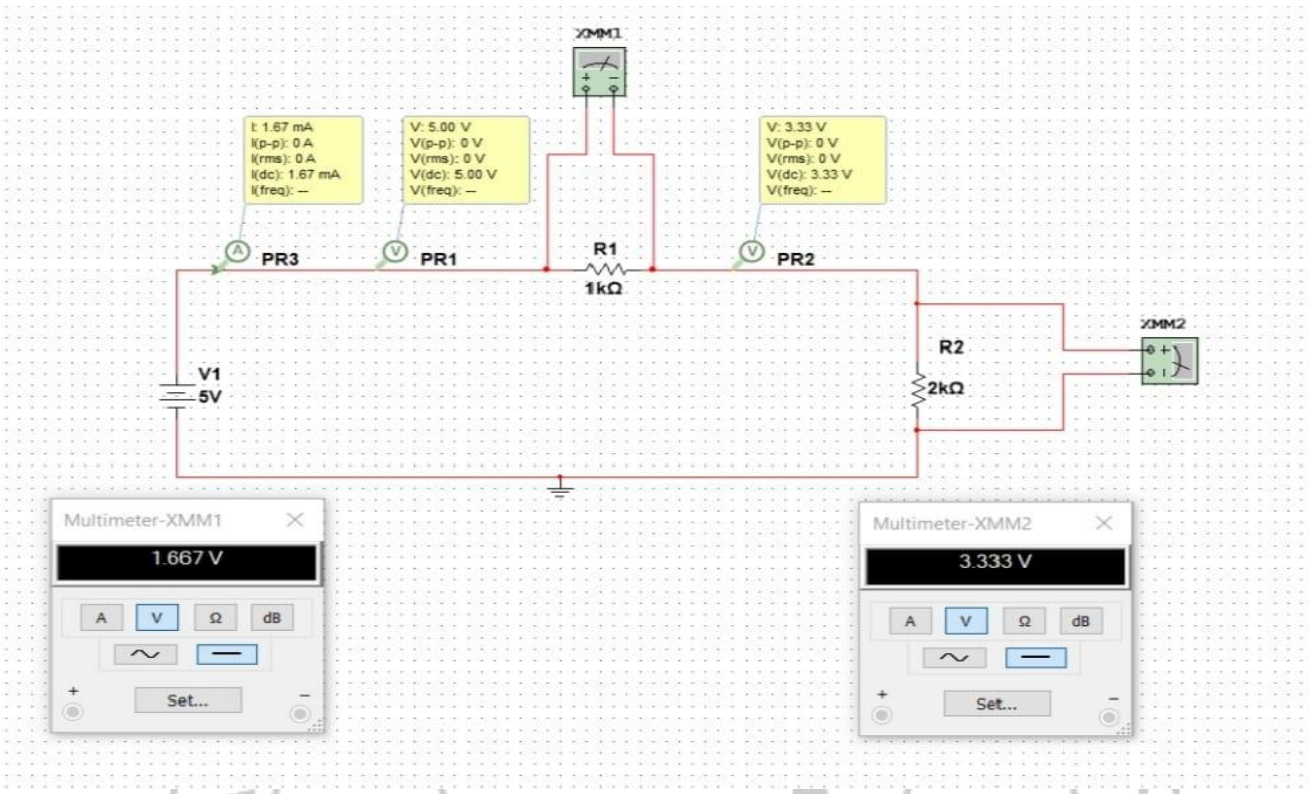
5) Red - 2
Red - 2
Red - 2
Gold - 5% tolarence
Resistance = $\{(2\times10)+2\}\times10^2 \pm 5\%$
$= 2200 \pm 110\ \Omega$

6) Yellow - 4
Violet - 7
Orange - 3
Gold - 5% tolarence
Resistance = $\{(4\times10)\times7\}\times10^3 \pm 5\%$
$= 47000 \pm 2350\ \Omega$

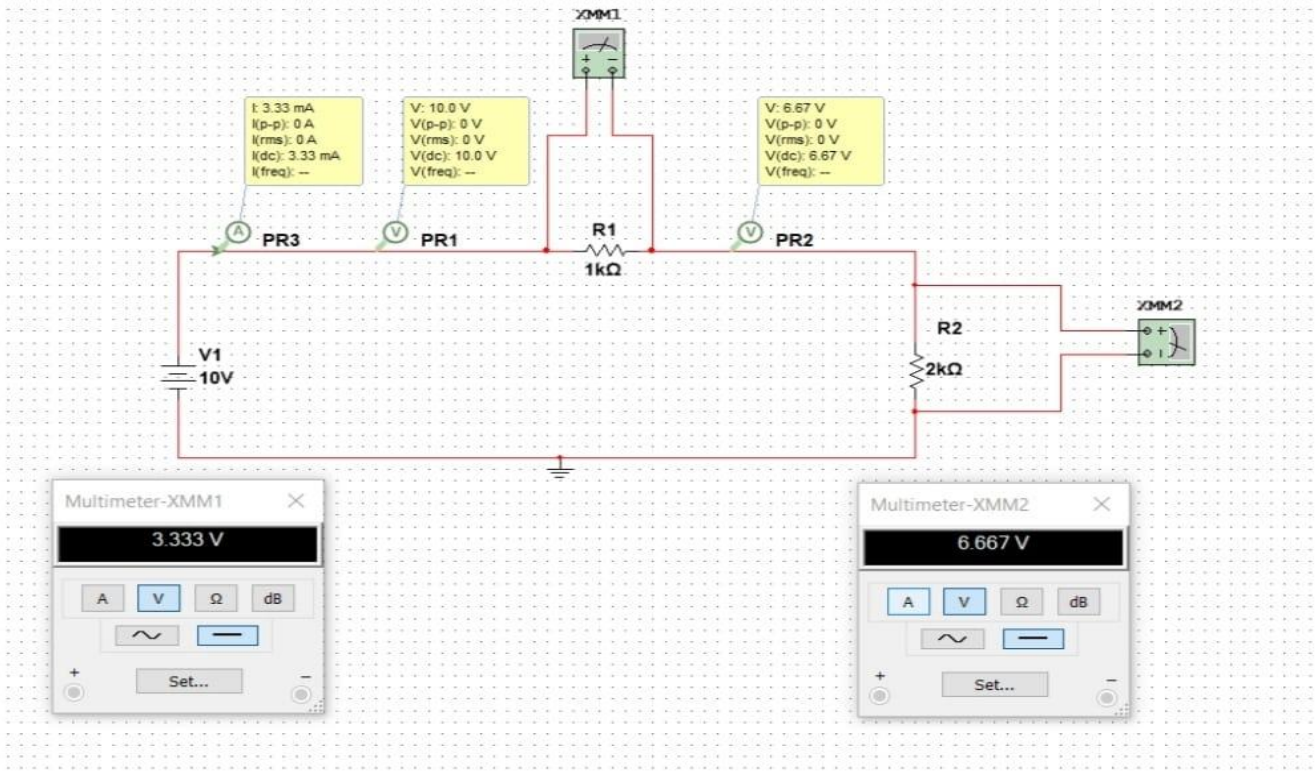


E	Theoretical Calculation						Multimeter readings				
	R_T	I	V_{ab}	V_{cd}	V_a	V_b	I	V_{ab}	V_{cd}	V_a	V_b
5 V	3kohm	1.66667mA	1.66667V	3.33334V	5V	3.33333V	1.66667mA	1.66667V	3.33334V	5	3.33333V
10 V	3kohm	3.33333mA	3.33333V	6.66666V	10V	6.66667V	3.33333mA	3.33333V	6.66666V	10	6.66667V

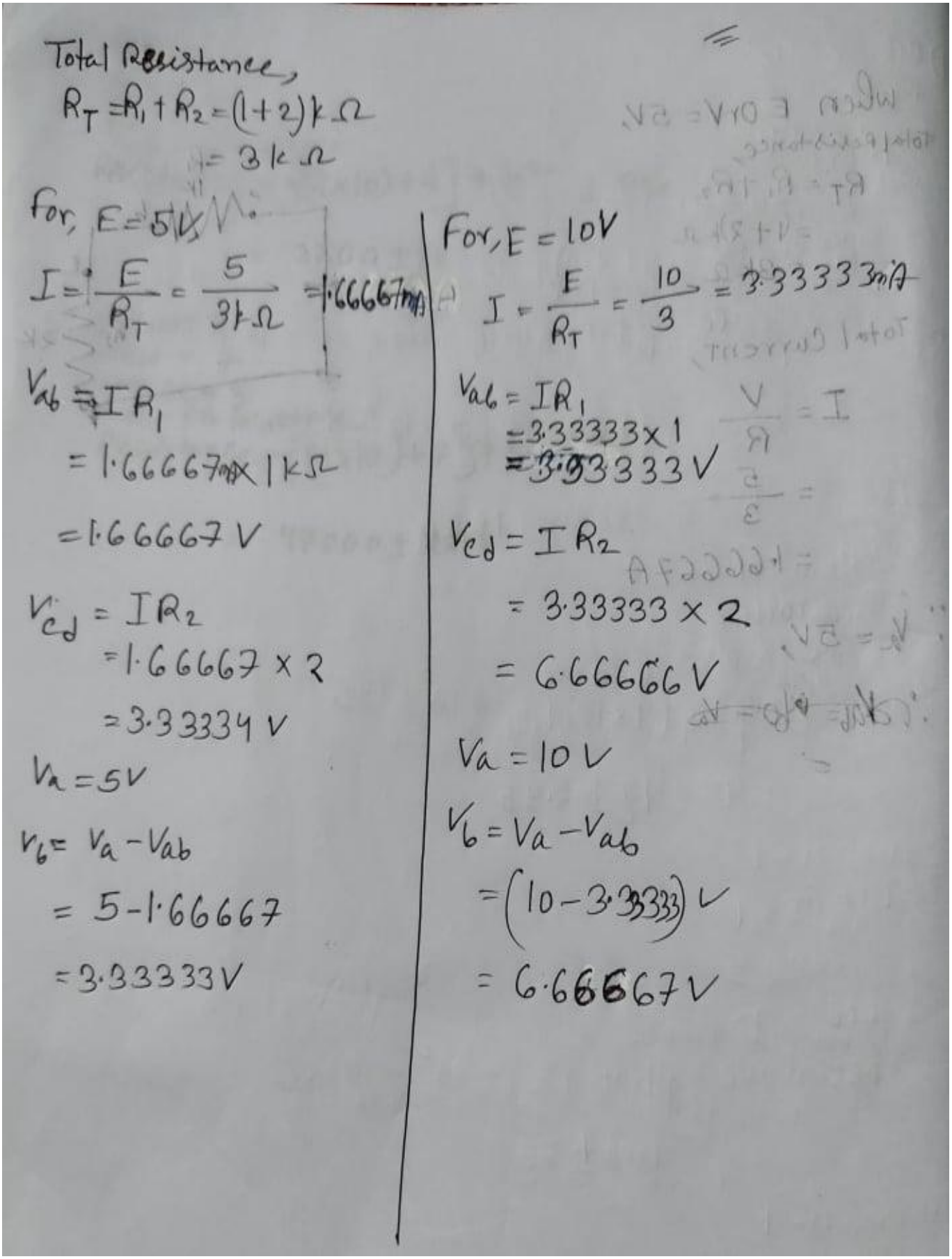
For E = 5V



For E = 10V



Calculation:



Discussion:

1. The trainer board and the multimeter was checked before the start of the experiment.
2. The resistor was placed properly according to the figure.
3. The value of the voltage was increased gradually as applying a large voltage can damage the resistors.
4. During the experiment some error was taken place due to the fault of voltage source. It was solved with the help of course instructor.
5. Finally all the data was placed in the data table. For the given equation, a result was obtained

Conclusions:

In this experiment the basic idea of DC terms and circuits was observed and verified with specific theory.Also we come to know how to measure the voltages and current using multimeter. So the experiment is successful .