East West University

Department of CSE

LAB REPORT

Course Code and Name: CSE209 Electrical Circuits		
Experiment no: 01		
Experiment name: Introduction to Circuit Elements and Variables		
Semester and Year: Fall 2021	**Course Instructor information:** M Saddam Hossain Khan Senior Lecturer, Department of Computer Science and Engineering	
Name of Student: D.M. Rafiun -Bin- Masud		
Student Id: 2019-3-60-137		
Date of Report Submitted: 1 December,2021	**Pre-Lab Marks:**	
	Post Lab Marks:	
	TOTAL Marks:	

ABSTRACT

By the experiment, we learn to use circuit, estimate current & voltage of that circuit. The relation between Voltage and current in a resistor which is (V=IR) & how Ohm's law works is also noticeable. We can differentiate voltage & current, also detect actual & experimental value. With the knowledge of this experiment, we will be able to draw the circuit of simple series and parallel resistor circuits with the use of voltmeter ammeter & compare them. We can say that the values are nearly close to actual. Therefore, approximately our experiment was proper. In short, from the result if this experiment was done in laboratory physically, we could have observed some differences between theoretical and experimental procedure. In this case, as we did this in pspice, no differences were detectable.

Objectives

1. To be accustomed with circuit variables and elements.
2. To find out about Ammeter and way to measure the DC current with a circuit element and ammeter.
3. To know about voltmeter and how to measure the DC voltage across a circuit element using a voltmeter.
4. To know about resistors and how to measure the Resistor with the help of multimeter.
5. To do the simulation of a circuit.
6. To verify the ohm's law

THEORY AND EXPERIMENTAL METHODS

Ohm's law is V=IR. With the help of Ohm's law, it is possible to find the voltage and current through a circuit element. Here circuit is necessary to find out the voltage and current. Active elements and

passive elements are the two types of elements in an electric circuit. On the other hand, resisters are known as an active element. Here, the current passing through the resistor is I A and the voltage drop across the resistor is V volt. V is equals to the emf to battery E

Circuit diagram using PSpice simulator

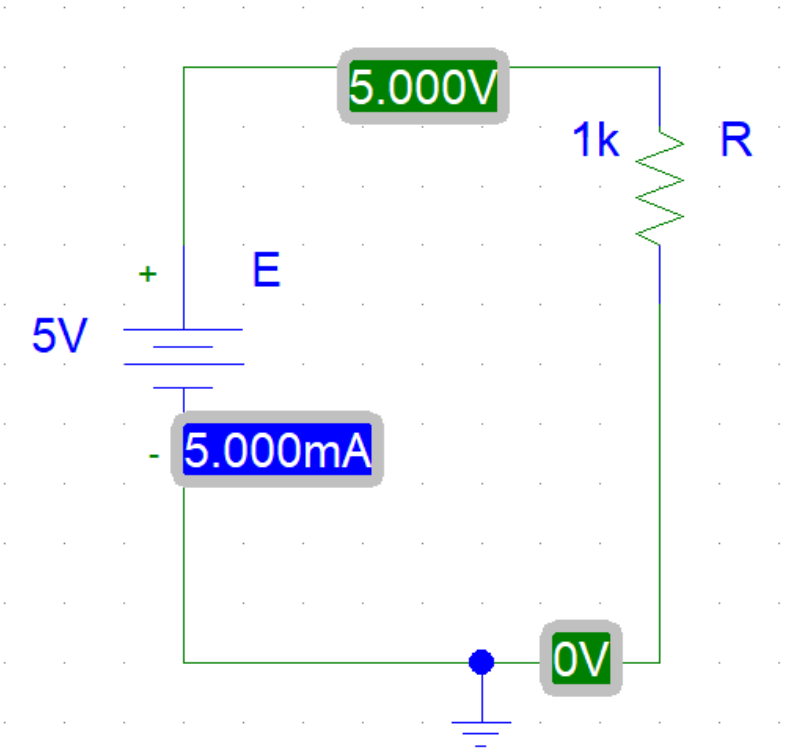


Figure 1. Circuit diagram

Table 1. Experimental Datasheet.

Observation number	Set value of E(v)	Measured Value of V (V)	Measured Value of I (mA)	Measured Value of R (Ω)
1	5	5	5	1000
2	6	6	6	
3	7	7	7	
4	8	8	8	
5	9	9	9	
6	10	10	10	

Answer(s) to the Post-Lab Question(s):

Answer to the question no:1

Ohm's law, $V = IR$

So, $I = \frac{V}{R}$

For, V=5V, I= 5mA
For, V= 6V, I=6mA
For, V= 7V, I=7mA
For, V= 8V, I=8mA
For, V= 9V, I=9mA
For, V= 10V, I=10mA

Answer to the question no:2

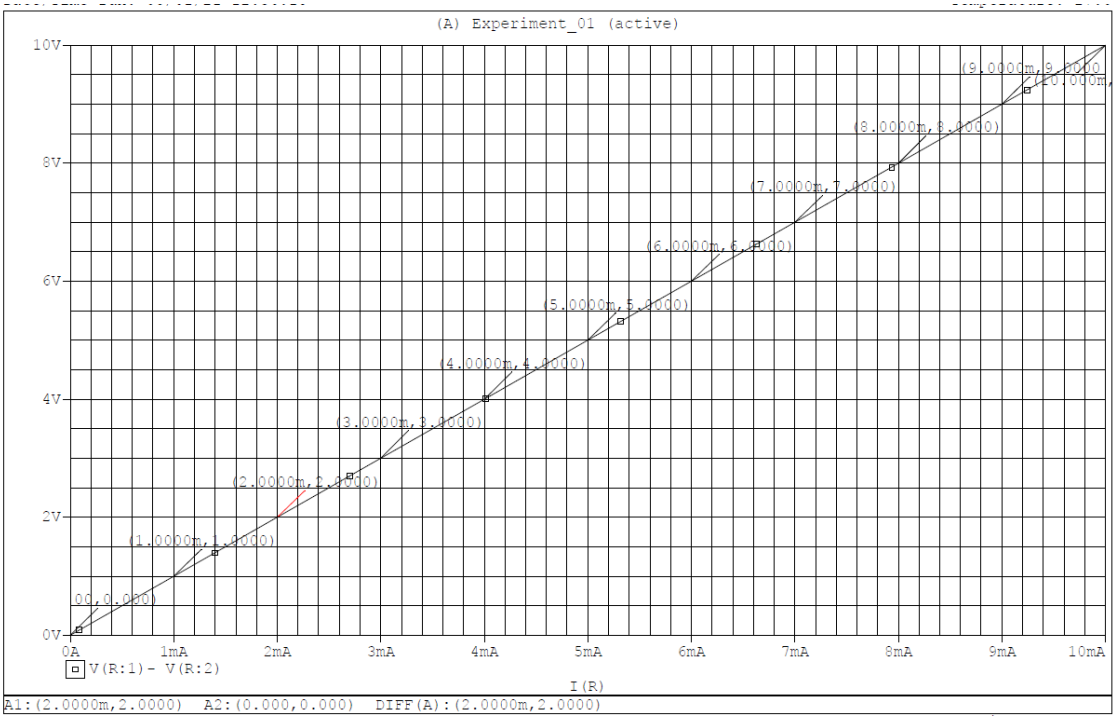
Theoretically all values of R and the simulated value of R is same. R= 1000 Ω

Answer to the question no:3

From the given experiment datasheet, we can observe that the set value of E and the measured value of V is same and there is zero discrepancy in the values. It is because the experiment is conducted by simulation not manually. In simulation, there is no loss of energy and that is why the values have zero discrepancy.

Observation number	Set value of E(v)	Measured Value of V (V)
1	5	5
2	6	6
3	7	7
4	8	8
5	9	9
6	10	10

Answer to the question no:4



Here, this plot is linear.
We know, V=IR
So, R=V/I Hence,
When V=5V and I=5mA then R= 1K Ω
When V=6V and I=6mA then R= 1K Ω
When V=7V and I=7mA then R= 1K Ω
When V=8V and I=8mA then R= 1K Ω
When V=9V and I=9mA then R= 1K Ω
When V=10V and I=10mA then R= 1K Ω

This Value of R and the measured value of R is same. So, there is no difference

Answer to the question no:5

For measurement of voltage, the multimeter must be connected in parallel to the circuit element whose voltage is to be measured. Then the knob of the multimeter must be turned to show the reading of voltage and thus the voltage is measured. For measurement of current, the

multimeter must be connected in series with the circuit element whose current is to be measured. The knob of the multimeter must be turned to show the reading of the current and thus the current is measured. As we are stimulating in online, so we don't need to use that.

Result

After comparing the theoretical & measured values of I, V, R, we found that there is no change between the values.

Conclusions

At the end of the experiment, we have practical knowledge that how to work with circuits and the relation between voltages and currents.

Answer(s) to the Pre-Lab Question(s):

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Pre-lab Report

Question: Theoretically calculate the values of I for the circuit of figure 3 for E = 5, 6, 7, 8, 9, 10 V and R = 1000 Ω

Ans: We know,

$$I = \frac{V}{R}$$

$$\therefore I = \frac{E}{R}$$

So for, $E = 5V$, $I = \frac{5}{1000} = 5mA$

for, $E = 6V$, $I = \frac{6}{1000} = 6mA$

for, $E = 7V$, $I = \frac{7}{1000} = 7mA$

for, $E = 8V$, $I = \frac{8}{1000} = 8mA$

for, $E = 9V$, $I = \frac{9}{1000} = 9mA$

for $E = 10V$, $I = \frac{10}{1000} = 10mA$