Physics Lab 2

Experiment no.3
Ohms Law

Objective:
In this experiment you will learn to use the multi-meter to measure voltage, current and resistance
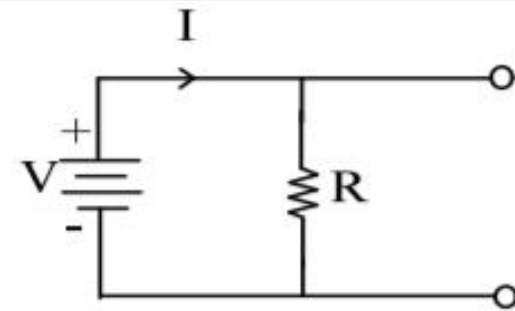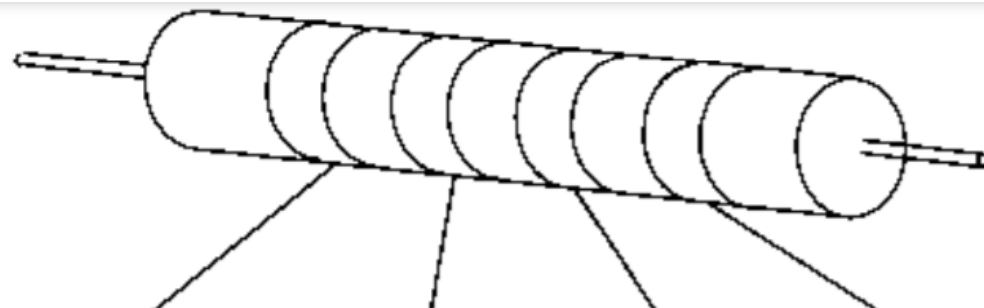
$$V = IR$$

Figure 1: Diagram showing a voltage forcing a current to flow through a resistor.

Color	First Color Band Significant Digit	Second Color Band Significant Digit	Third Color Band Significant Digit	Tolerance Band
Black	0	0	1	--
Brown	1	1	10	--
Red	2	2	100	--
Orange	3	3	1,000	--
Yellow	4	4	10,000	--
Green	5	5	100,000	--
Blue	6	6	1,000,000	--
Violet	7	7	--	—
Gray	8	8	--	--
White	9	9	--	--
Gold	--	--	0.10	±5%
Silver	--	--	0.01	±10%
No color	--	--	--	±20%

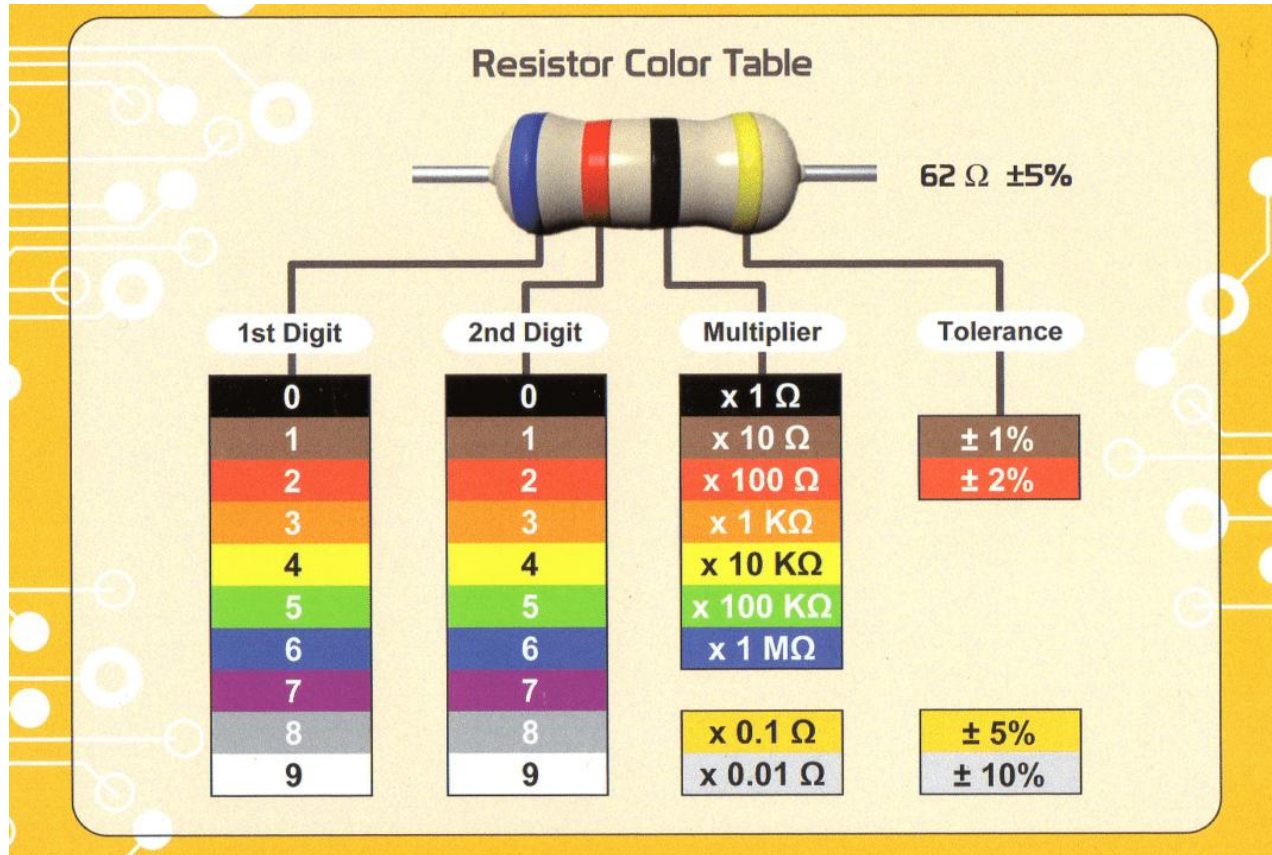
EXAMPLE

Yellow / Violet / Orange / Silver   (resistor colors)

4   /   7   / ×1,000 / ±10%

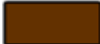47,000 Ω ± 10% or (using engineering notation) 47 KΩ = 10%

Example:

Resistor Color Table

62 Ω ±5%

1st Digit	2nd Digit	Multiplier	Tolerance
0	0	x 1 Ω	
1	1	x 10 Ω	± 1%
2	2	x 100 Ω	± 2%
3	3	x 1 KΩ	
4	4	x 10 KΩ	
5	5	x 100 KΩ	
6	6	x 1 MΩ	
7	7		
8	8	x 0.1 Ω	± 5%
9	9	x 0.01 Ω	± 10%

6   2   X 10^0 ± 5%

Example 2
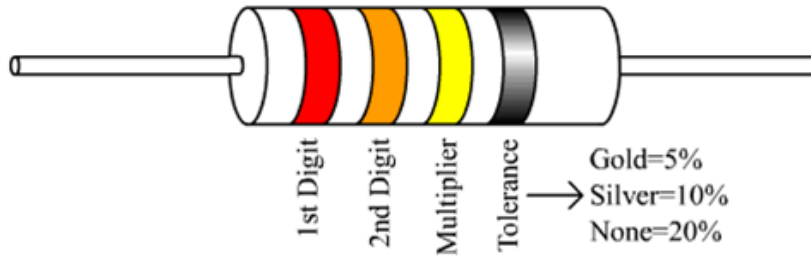
Color	Digit	Multiplier	Tolerance (%)
Black	0	10^0 (1)	
Brown	1	10^1	1
Red	2	10^2	2
Orange	3	10^3	
Yellow	4	10^4	
Green	5	10^5	0.5
Blue	6	10^6	0.25
Violet	7	10^7	0.1
Grey	8	10^8	
White	9	10^9	
Gold		10^{-1}	5
Silver		10^{-2}	10
(none)			20

1st Digit 2nd Digit Multiplier Tolerance

Gold=5%
Silver=10%
None=20%

Experiment Part :

Part 1: measure resistance in series
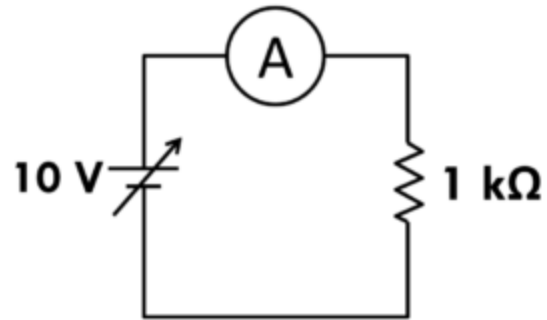
Voltage (V)	Current (mA)
0 V	0 V
1 V	1 mA
2 V	2 mA
3 V	2.99 mA
4 V	4 mA
5 V	5 mA
6 V	6 mA
7 V	6.99 mA
8 V	8 mA
9 V	9 mA
10 V	10 mA

Slope = R=
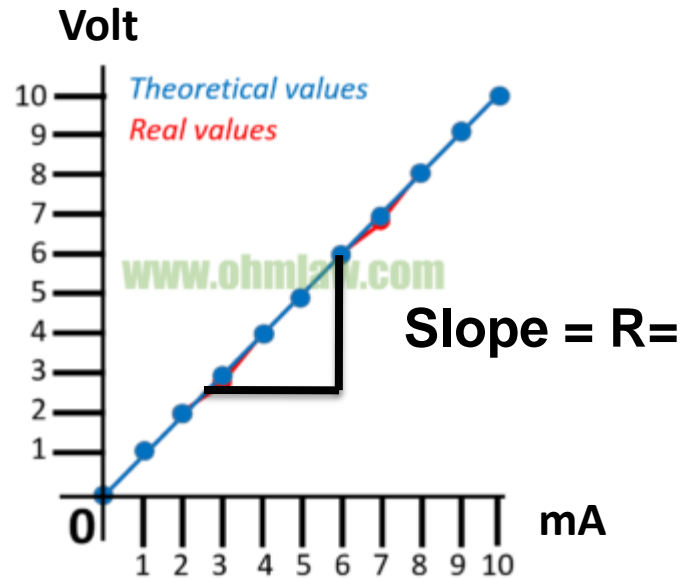
Experiment Part :

Part 1: measure resistance in parallel
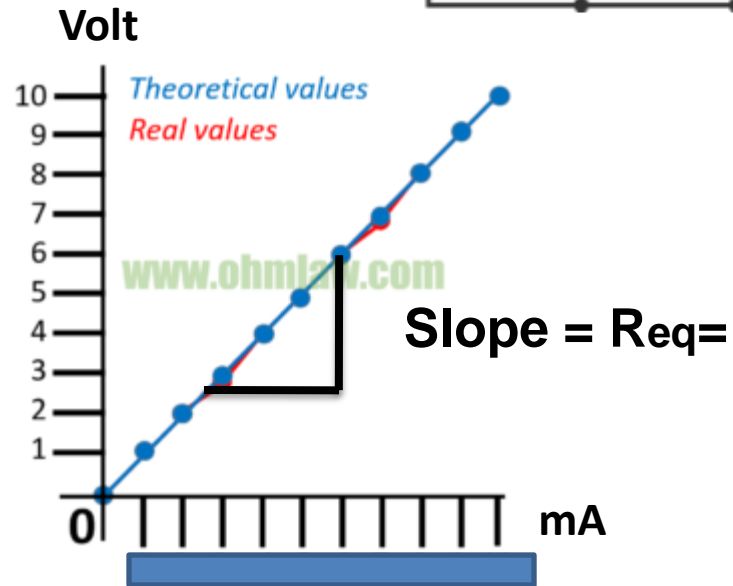
$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2}$$
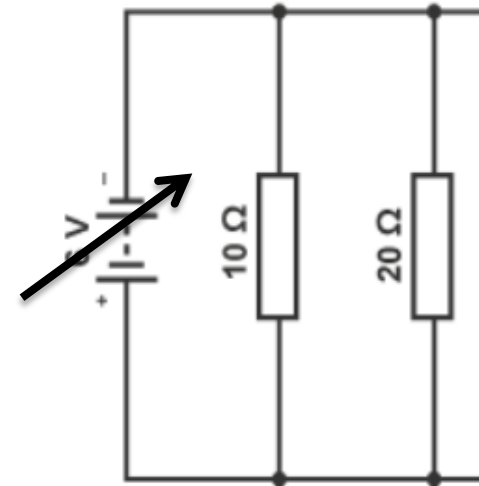
Voltage (V)	Current (mA)
0 V	
1 V	
2 V	
3 V	
4 V	
5 V	
6 V	
7 V	
8 V	
9 V	
10 V	

Volt

Theoretical values
Real values

www.ohmlaw.com

Slope = R_eq=

mA

Report :

1- Fill the data in the link attached in (LMS) of experiment in the table

for both series and parallel

2- plot the voltage versus current

3- calculate the resistance from the slope

4- calculate the percentage errors between

R experiment and R theoretical (from colour code)

يتم تسليم التقرير على
LMS