

**EXPERIMENT 2: OHM'S LAW****Course Learning Outcome:**

Solve problems of **electric current**, electronics, magnetism, optics, quantization of light, wave properties of particles and nuclear physics.

(C4, PLO 4, CTPS 3, MQF LOD 6)

**Learning Outcomes:**

At the end of this lesson, students will able to explain the experiment to:

- verify Ohm's Law.
- determine effective resistance of resistors in series and parallel by graphing method

**Student Learning Time:**

Face-to-face	Non face-to-face
1 hour	1 hour

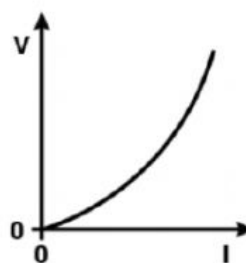
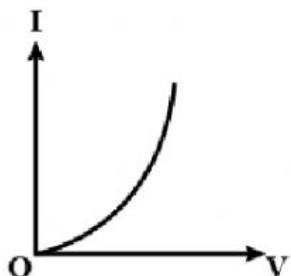
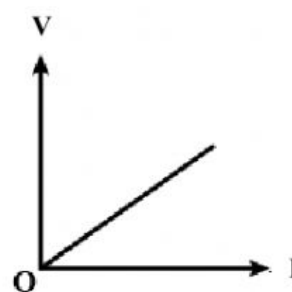
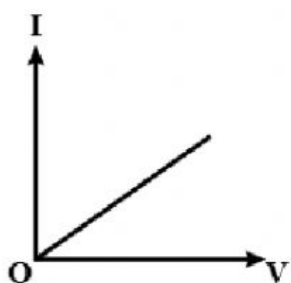
**Direction:** Read over the lab manual and then answer the following question.

**Introduction**

- Define Ohm's Law

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- Select which of the following is the **CORRECT** graph of Voltage against current for an Ohmic's conductor at a constant temperature  $T$  (K).



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3. What is the quantity which represent the gradient of the Graph 1 Above

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4. Name the configuration for the following resistors arrangement

Configuration A	Configuration B
<p>Figure 1</p>	<p>Figure 2</p>

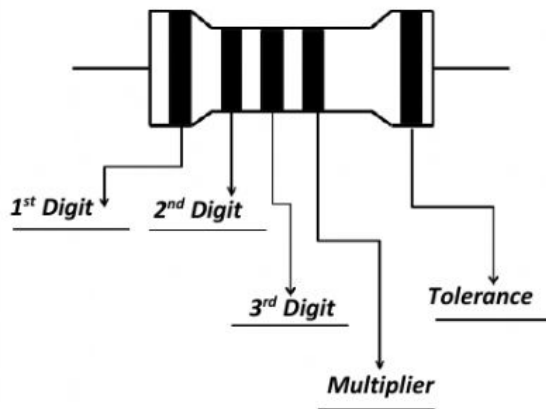
5. If each of the resistors has a resistance of  $27\ \Omega$ , determine the effective resistance for

i. Configuration A : .....

ii. Configuration B : .....

6. What does each of the band on the resistor represent and determine the resistance for each of the resistor.

4 Band Resistor	
	<p>a. Determine the resistance of the resistor if</p> <p>1<sup>st</sup> band : .....</p> <p>2<sup>nd</sup> band : .....</p> <p>Multiplier : .....</p> <p>Tolerance : .....</p> <p>Resistance : .....</p>

**5 band Resistor**

b. Determine the resistance of the resistor if

1<sup>st</sup> band : .....

2<sup>nd</sup> band : .....

3<sup>rd</sup> band : .....

Multiplier : .....

Tolerance : .....

Resistance: .....

7. What does the tolerance band of the resistor tells you?

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 .....

**Experiment**

8. What is the used of the miliammeter/ammeter and voltmeter in the circuit and how they are connected with the resistors?

Miliammeter/Ammeter: .....

Voltmeter: .....

9. In the step three of the experimental procedure, you were asked to find the minimum current and voltage in the circuit, explain the relevant of this particular step.

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10. In the experiment, milliammeter is used to measure current in a series circuit and ammeter is used for the parallel circuit. Explain.

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 .....

11. Explain why only voltmeter is provided instead of milivoltmeter in the experiment to measure the voltage.

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12. How do you determine the sensitivity of the measuring instruments (Voltmeter/Miliammeter/Ammeter).

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### **Data Analysis**

13. The equation use to plot the graph is

$$V = IR$$

Sort the quantities from the equation according to its component below

Component	Quantity
Y-Axis	
X-axis	
m, gradient	
c ,Y-Intercept	

14. What is the unit for the gradient

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15. Which of the graph is expected to have a bigger gradient, the series or the parallel circuit?

Explain your answer.

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