SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME : 19EE101 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

I YEAR /I SEMESTER Artificial Intelligence and Datascience

Unit 1 – Electrical Circuits and Measurements

Terminologies

Current: Current is just the rate of flow of electric charge (A)

Voltage: Voltage is the difference in electric potential between two points (V)

Power: The rate at which work is done is transformed into an electrical circuit (W)

Resistance: Is a measure of the opposition to current flow in an electrical circuit.

Inductance: Stores electrical energy in the form of magnetic field

Capacitance: Stores electrical energy in the form of electric field.

Circuit: A circuit is a path that starts and stops at the same place

DEFINITION

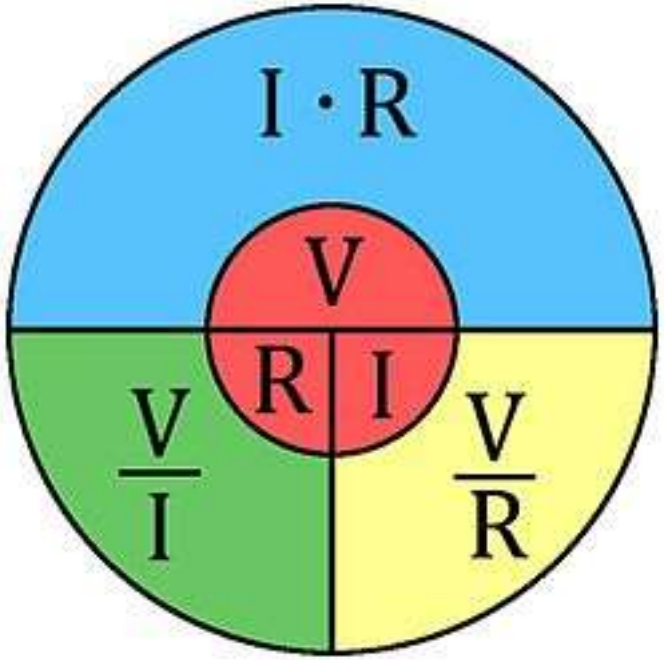
- The potential difference (voltage) across an ideal conductor is proportional to the current through it. The constant of proportionality is called the "resistance", R.

- $I = V/R$
- $V = IR$
- $R = V/I$

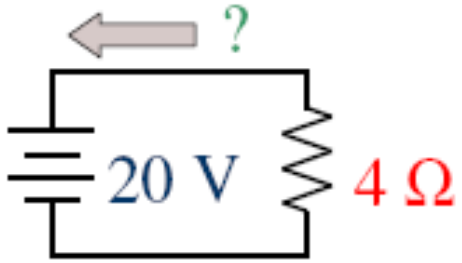
I = Current

V = Voltage

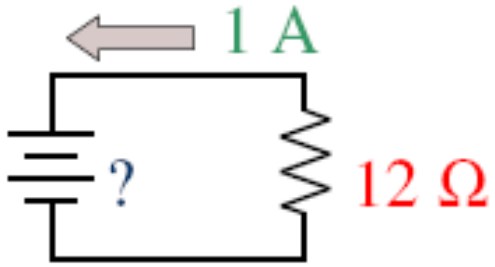
R = Resistance



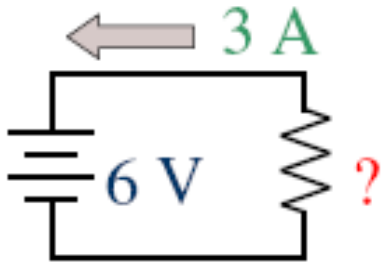
Simple Circuits with Ohm's Law



$I = (20/4) = 5\ A$



$V = 1 \times 12 = 12\ V$

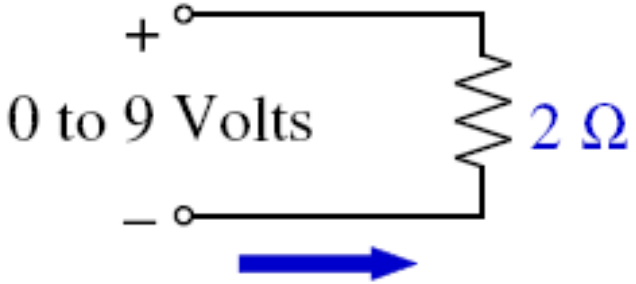


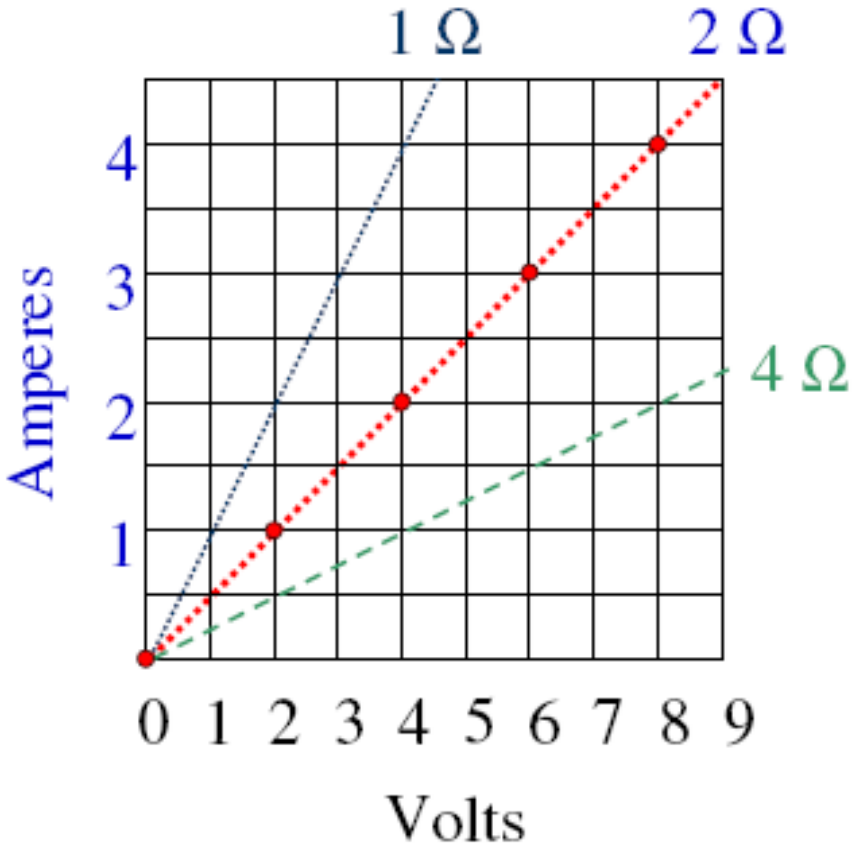
$R = (6/3) = 2\ ohms$

Can you solve?

1. V = 14 V, I = 2 A, R = ?
2. V = 25 V, I = 5 A, R = ?
3. V = 6 V, I = 1.5 A, R = ?
4. V = 24 V, I = 4 A, R = ?

LINEAR PROPORTION BETWEEN V & I





Power Dissipation in Resistance

- The amount of power dissipated in a resistance may be calculated using any one of three formulas, depending on which factors are known
- $P = I2 \times R$
- $P = V2 / R$
- $P = V \times I$

Assessment 2

1.Solve for the power, P, dissipated by the resistance, R

a. I = 1 A, R = 100Ω , P = ?

b. I = 20 mA, R = 1Ω , P = ?

c. V = 5 V, R = 150Ω , P = ?

d. V = 22.36 V, R = 1Ω , P = ?

2. How much power is dissipated by an 8Ω load if the current in the load is 200 mA?

Limitations of Ohm's Law

1) This law cannot be applied to unilateral networks.
2) Ohm's law is also not applicable for non – linear elements.

REFERENCES

1. Bhattacharya. S.K, “Basic Electrical and Electronics Engineering”, Pearson Education , (2017)
2. Muthu subramanian R, SalivahananS,“ Basic Electrical and Electronics Engineering”, Tata McGraw Hill Publishers, (2009)
3. V.Mittle“ Basic Electrical Engineering”, Tata McGraw Hill Publishers, (2017)
4. Nagrath. I.J, “Electronics: Analog and Digital”, Prentice Hall India Pvt. Ltd., (2013)
5. Black & Decker , “The complete guide to Electrical Wiring” , S.Chand & Company Ltd,(2012)

THANK YOU