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 COMPUTER SCIENCE AND DESIGN

COURSE NAME : 19EE01 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

I YEAR /II SEMESTER - COMPUTER SCIENCE AND DESIGN

Unit 1 – Electrical Circuits and Measurements

Topic 2 : Ohms' Law

DEFINITION

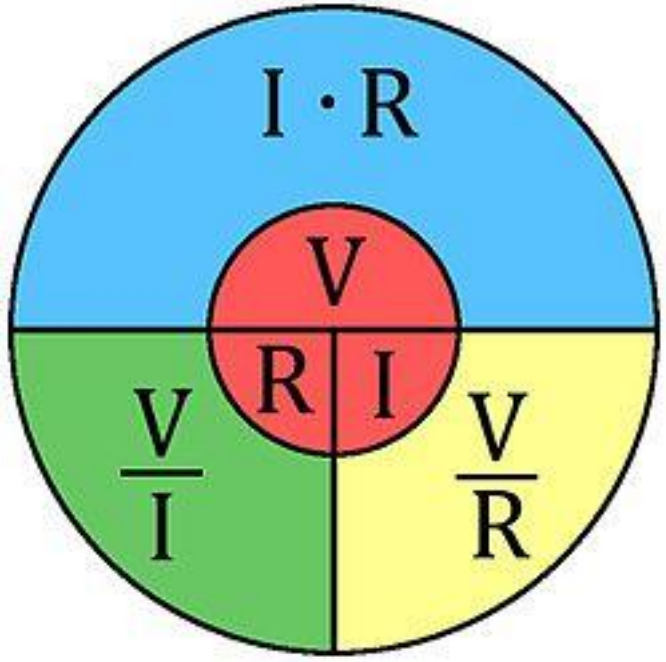
- The potential difference (voltage) across an ideal conductor is proportional to the current through it. The constant of proportionality is called the "resistance", R.

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

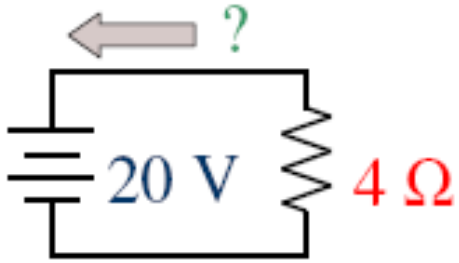
I = Current

V = Voltage

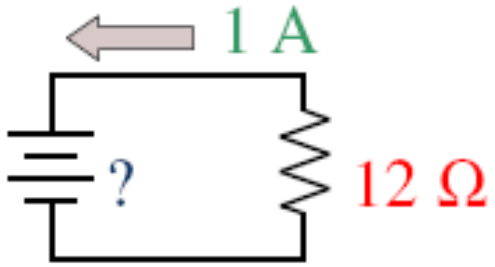
R = Resistance



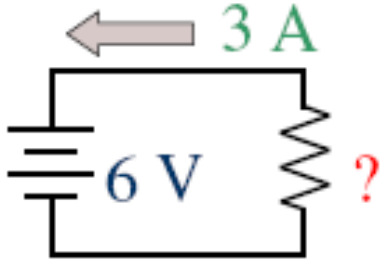
Simple Circuits with Ohm's Law



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



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

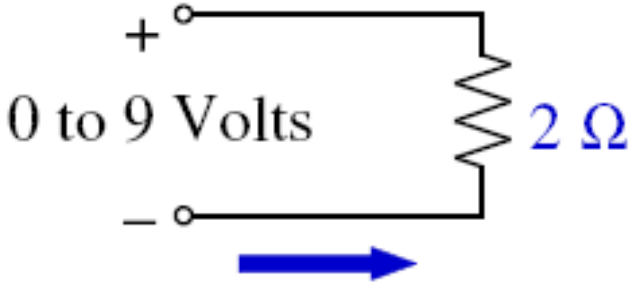


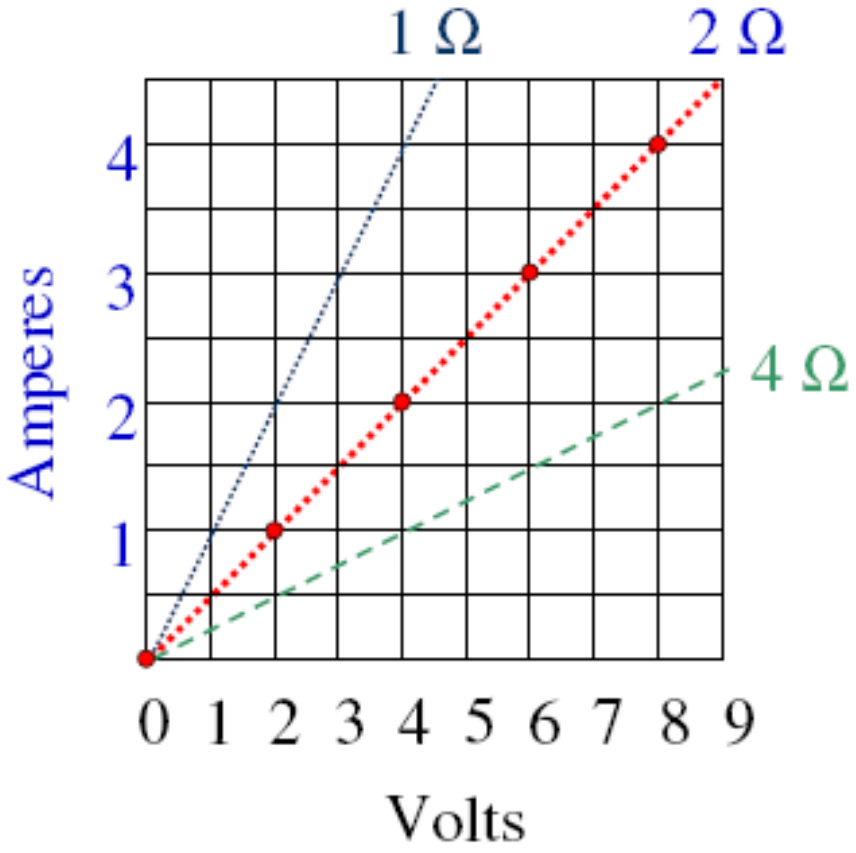
$R = (6/3) = 2\ \text{ohms}$

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

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2. Muthu Subramanian R, Salivahanan S,“ Basic Electrical and Electronics Engineering”, Tata McGraw Hill Publishers, (2009)
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4. Nagrath. I.J, “Electronics: Analog and Digital”, Prentice Hall India Pvt. Ltd., (2013)

THANK YOU