



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade

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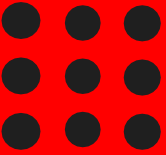
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**COURSE NAME : 19EE101 BASIC ELECTRICAL AND ELECTRONICS
ENGINEERING**

I YEAR /II SEMESTER INFORMATION TECHNOLOGY

Unit 1 – Electrical Circuits and Measurements

Ohms' Law





DEFINITION

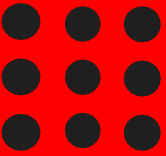
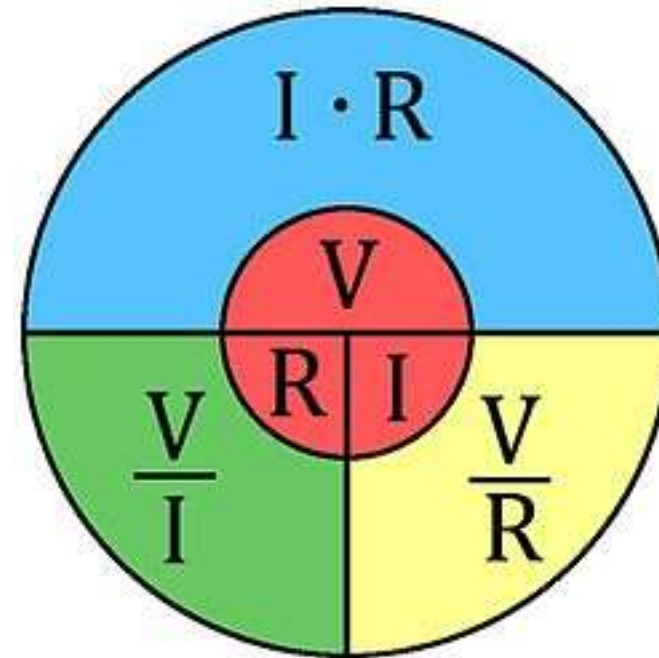
- The potential difference (voltage) across an ideal conductor is proportional to the current through it. The constant of proportionality is called the "resistance", R .

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

$I =$ Current

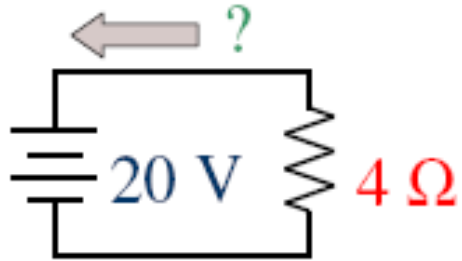
$V =$ Voltage

$R =$ Resistance

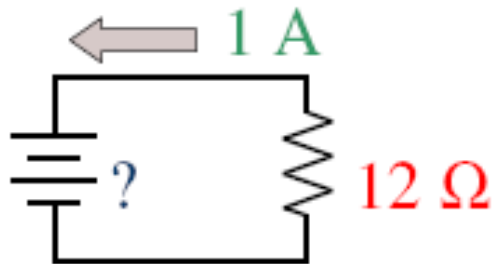




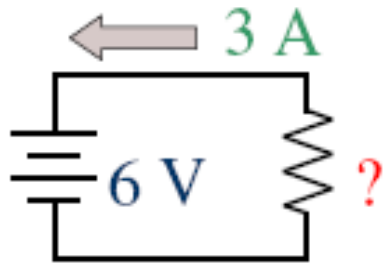
Simple Circuits with Ohm's Law



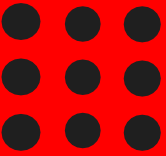
$$I = (20/4) = 5 \text{ A}$$



$$V = 1 \times 12 = 12 \text{ V}$$



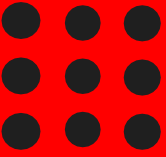
$$R = (6 / 3) = 2 \text{ ohms}$$





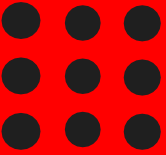
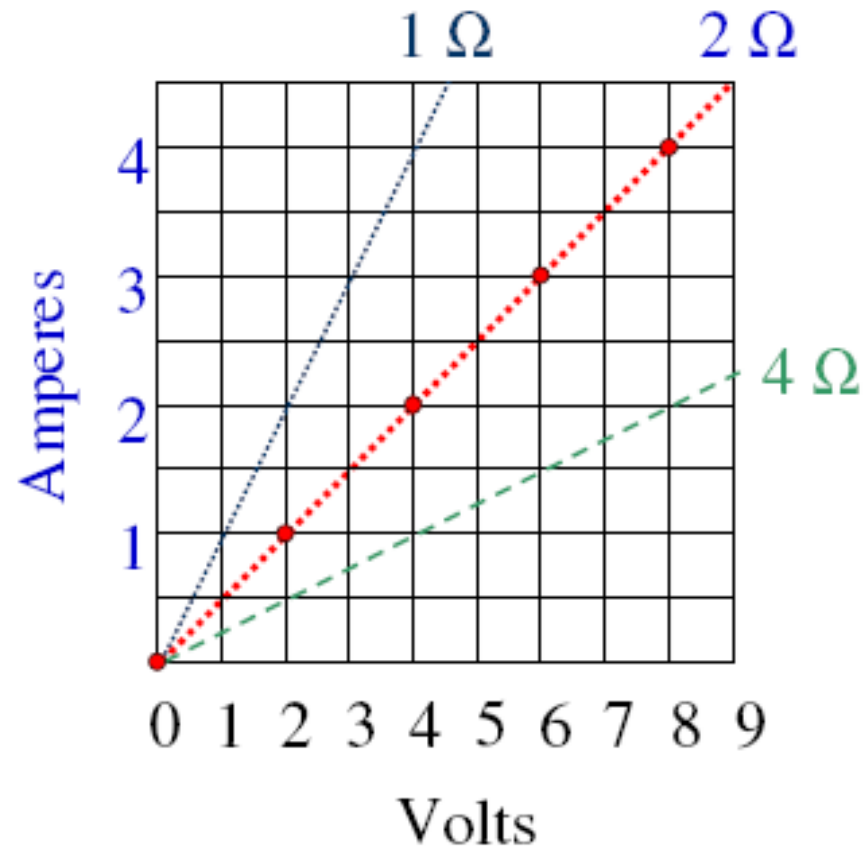
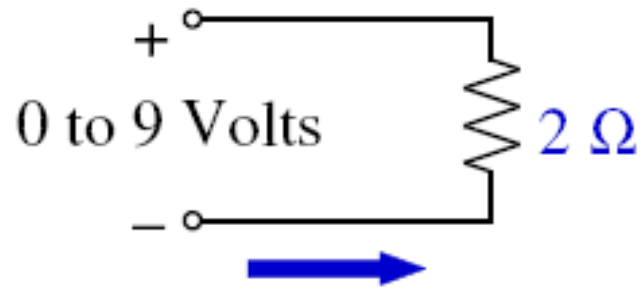
Can you solve?

1. $V = 14 \text{ V}, I = 2 \text{ A}, R = ?$
2. $V = 25 \text{ V}, I = 5 \text{ A}, R = ?$
3. $V = 6 \text{ V}, I = 1.5 \text{ A}, R = ?$
4. $V = 24 \text{ V}, I = 4 \text{ A}, R = ?$





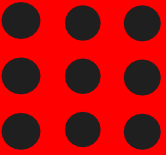
LINEAR PROPORTION BETWEEN V & I





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
- $P = I^2 \times R$
- $P = V^2 / R$
- $P = V \times I$





Assessment 2

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

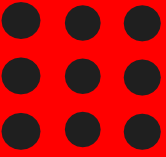
a. $I = 1 \text{ A}$, $R = 100\Omega$, $P = ?$

b. $I = 20 \text{ mA}$, $R = 1\Omega$, $P = ?$

c. $V = 5 \text{ V}$, $R = 150\Omega$, $P = ?$

d. $V = 22.36 \text{ V}$, $R = 1\Omega$, $P = ?$

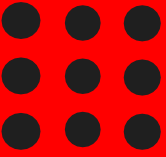
2. How much power is dissipated by an 8Ω load if the current in the load is 200 mA ?





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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THANK YOU

