



# **SNS COLLEGE OF TECHNOLOGY**

(An Autonomous Institution)

COIMBATORE-35

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



## **19EET101 / BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**I YEAR / I SEMESTER**

### **UNIT-I: ELECTRICAL CIRCUITS AND MEASUREMENTS**

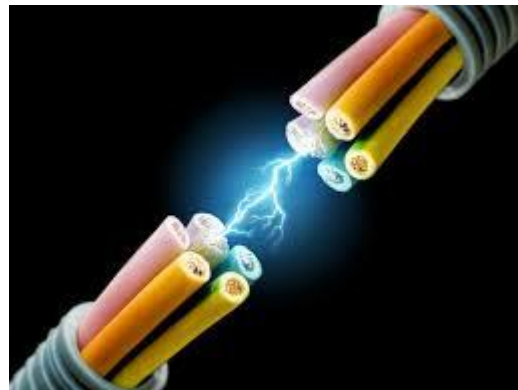
#### **ELEMENTARY CONCEPTS OF ELECTRIC CIRCUITS**





# TOPIC OUTLINE

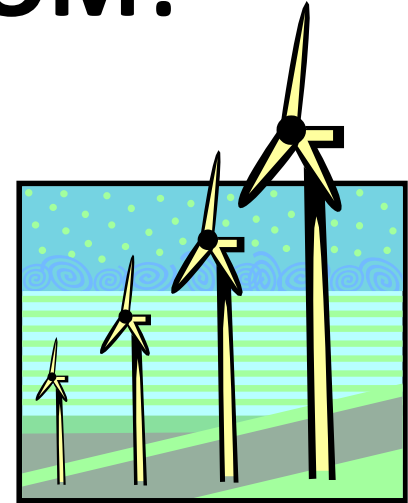
- Electricity?
- Voltage, Current, Resistance
- Nature of Current
  - Ohms Law





# ELECTRICITY COME FROM?

- We buy it from **Power Plants**
- We can generate it ourselves
  - **Diesel** or **gasoline** generators
  - Generated in our **Car**
  - Generated by home **Solar** or **wind power**
- We can get it from **Batteries**
- Sometimes we get it when we **don't want** it
  - **Lightning**





# VOLTAGE (V)

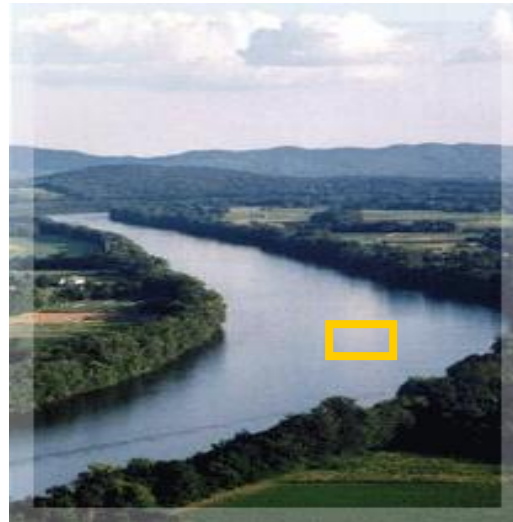
- It is the **push or pressure** behind current flow through a circuit, and is measured in **(V) volts**.
- **Quantitative** expression of the **potential difference** in charge between two points in an electrical field.





# CURRENT (I)

- Current refers to the **quantity/volume** of electrical **flow**. Measured in Amps (A)
- **Flow of Electrons**





# RESISTANCE (R)

- Resistance to the flow of the current. Measured in Ohms  $\Omega$
- It **opposes an Electric Current**





# CHART

Quantity	Symbol	Unit of Measurement	Unit Abbreviation
Current	I	Ampere ("Amp")	A
Voltage	E or V	Volt	V
Resistance	R	Ohm	$\Omega$



# NATURE OF CURRENT

- Most power generated is **Alternating Current (AC)** power where the current and voltage varies **Sinusoidal** with time
- **Direct Current (DC)** power **doesn't vary** with time
- Most **consumer** products **use** both **AC** and **DC**





## a. DC CURRENT

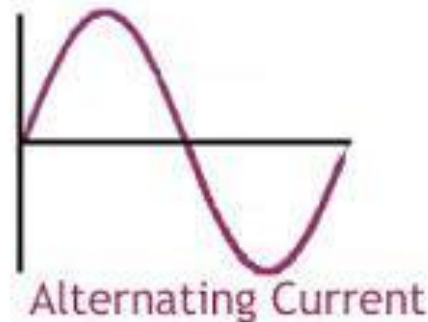
- DC current is used to **power electronics**
- DC current is easier to **store** (batteries)
- DC current is used in **mobile applications**
- **Inverters** convert **DC** to **AC**





## b. AC CURRENT

- AC current is easier to distribute
  - Higher voltage and smaller current yields same power distributed
  - **Transformers** make it easy to **change voltage levels** so smaller wire can used
- AC is used for most machinery, lights and appliances
- Power supplies convert **AC to DC**





# BASIC LAWS



- OHMS LAW
- KIRCHOFF'S LAW

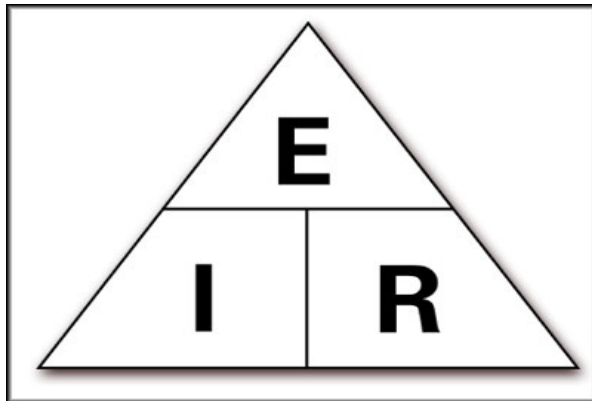


# OHMS LAW

- **Ohm's Law** explains the relationship between **Voltage** (V), **Current** (I) and **Resistance** (R)

## Definition:

States that at constant temperature, the current through a conductor between two points is directly proportional to the potential difference across the two points



$$V = I \times R$$



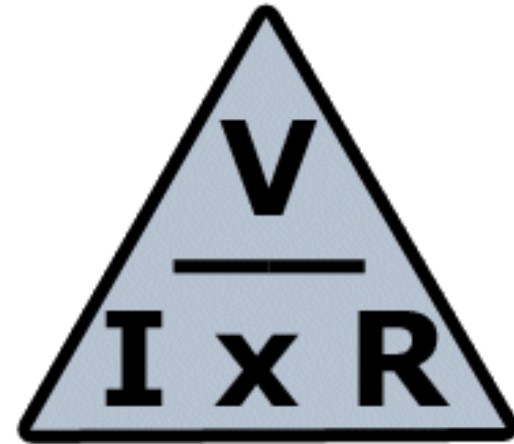


# OHMS LAW TRIANGLE

- $V (E) = I \times R$

- $I = \frac{V}{R}$

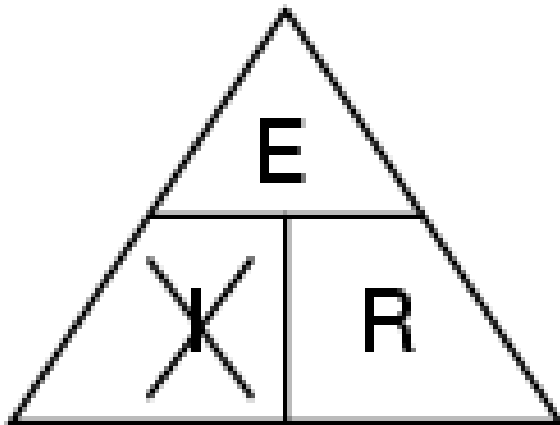
- $R = \frac{V}{I}$





# How do calculate?

- Battery voltage is **12V**
- Current is **Amp ?**
- Resistance **2 Ohm**

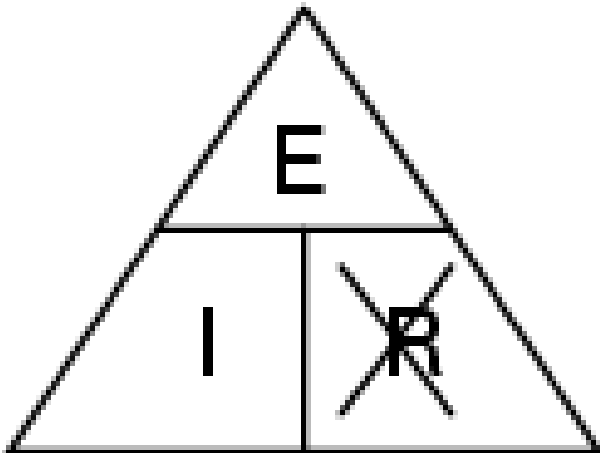


$$I = \frac{E}{R}$$



# How to calculate?

- Voltage is **12V**
- Current is **4 Amps**
- Resistance **Ohms ?**

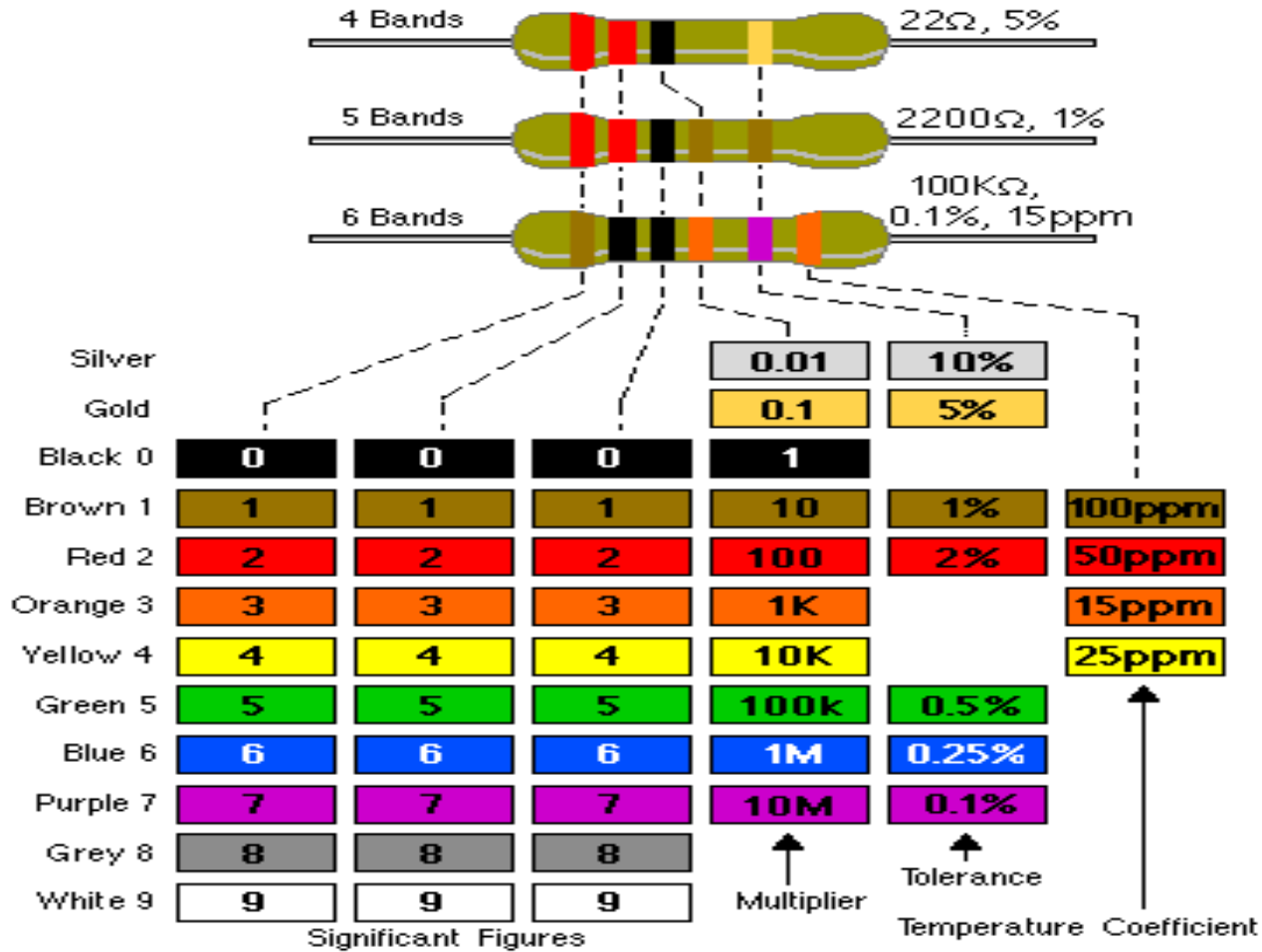


$$R = \frac{E}{I}$$





# RESISTOR COLOR CHART



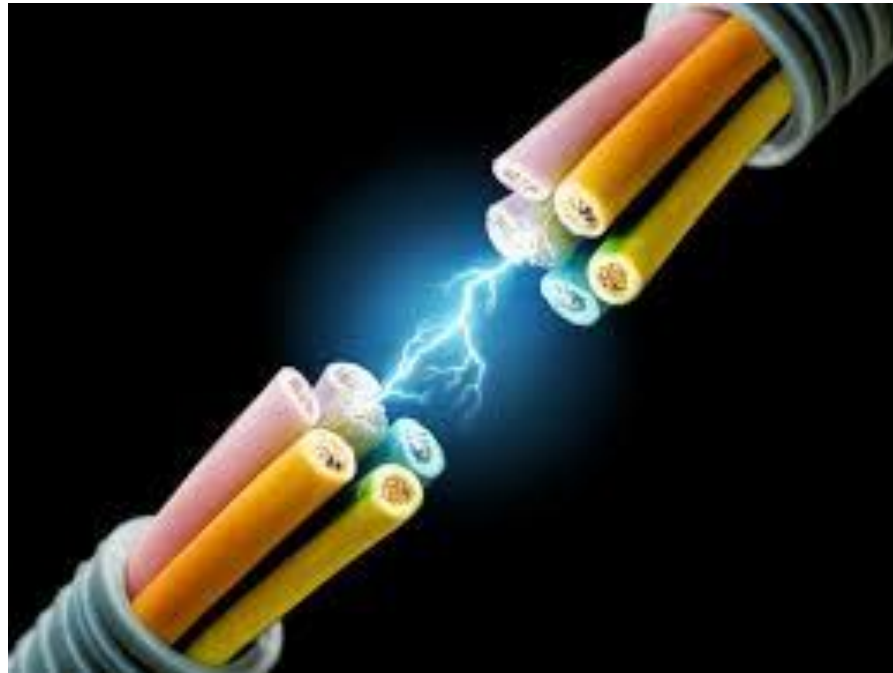
Resistor Color Code System







# RECAP...



# ...THANK YOU