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

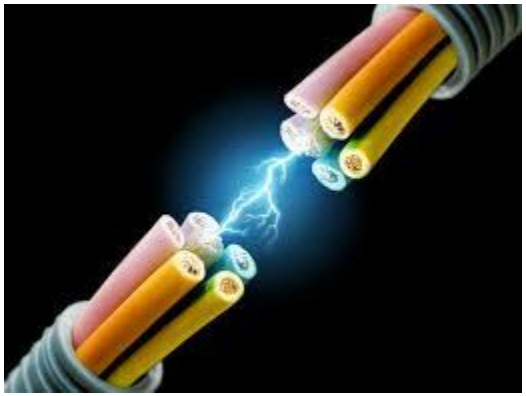
19EET103 / ELECTRIC CIRCUITS AND ELECTRON DEVICES
I YEAR / II SEMESTER

UNIT-I: DC CIRCUITS

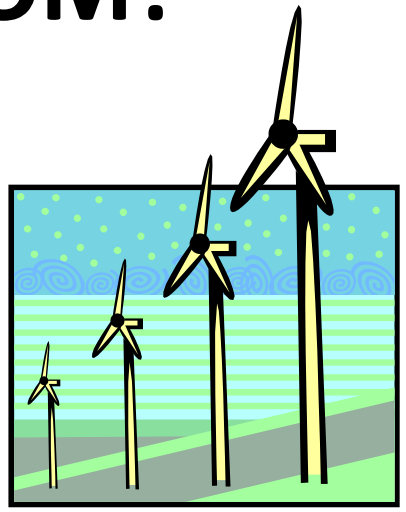
ELEMENTARY CONCEPTS OF ELECTRIC CIRCUITS

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 Ω
- It opposes an Electric Current

CHART

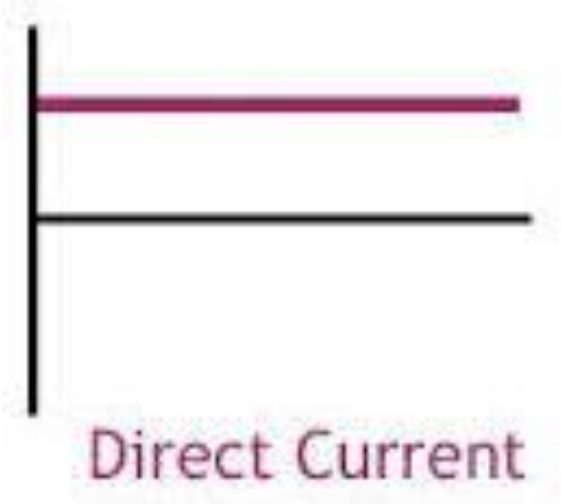
Quantity	Symbol	Unit of Measurement	Unit Abbreviation
Current	I	Ampere ("Amp")	A
Voltage	E *or* V	Volt	V
Resistance	R	Ohm	Ω

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

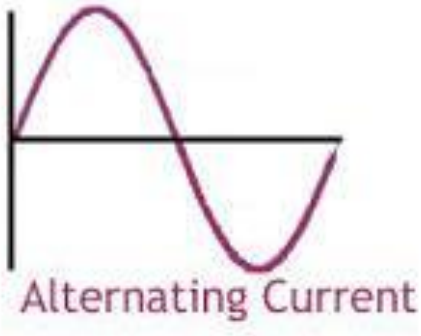
a. DC CURRENT

- 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

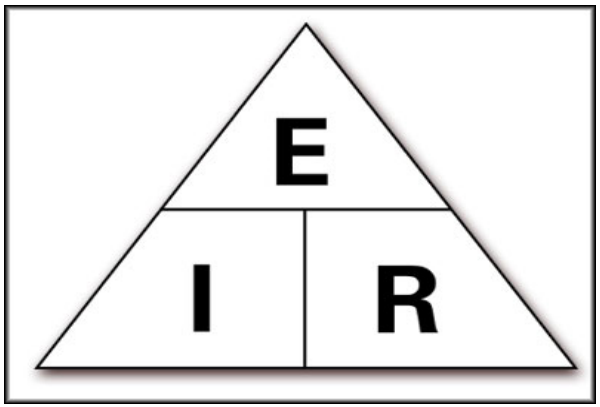
OHMS LAW

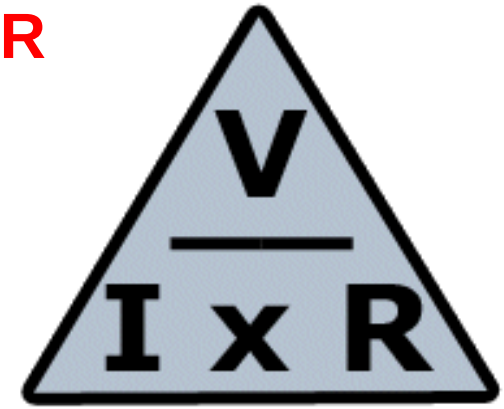
- Ohm's Law explains the relationship between Voltage (V), Current (I) and Resistance (R)

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 x R



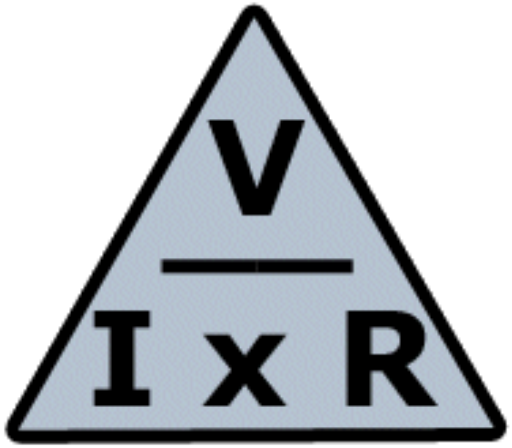


OHMS LAW TRIANGLE

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

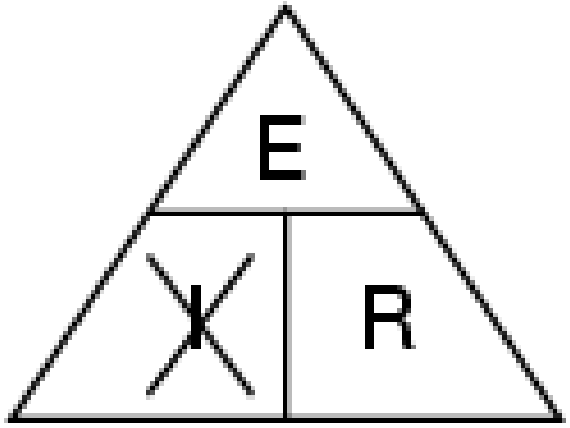
- $I = \frac{V}{R}$

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



How do calculate?

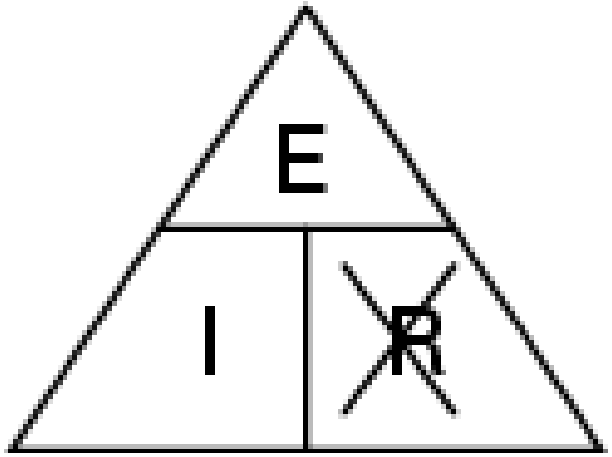
- Battery voltage is 12V
- Current is Amp ?
- Resistance 2 Ohm



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

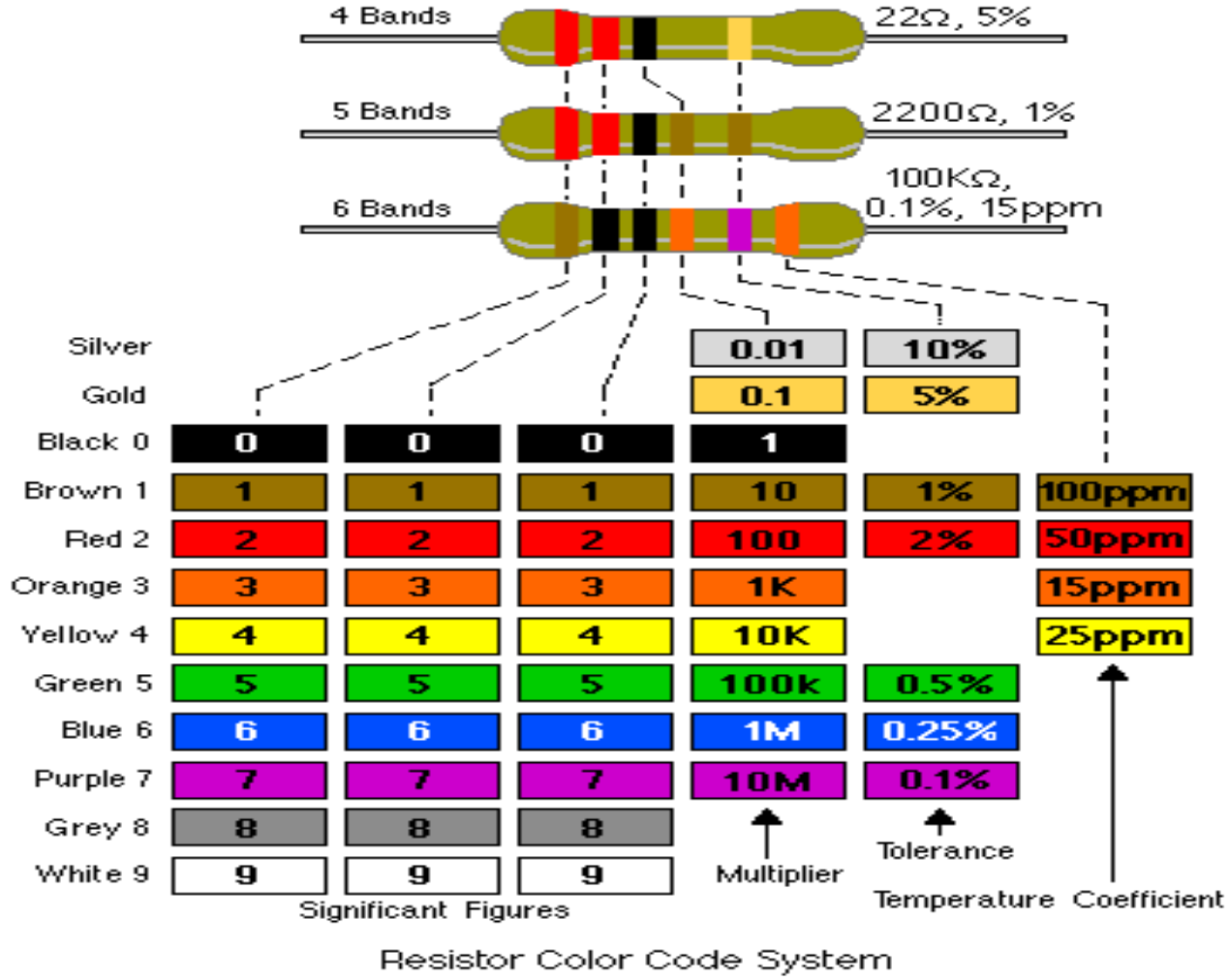
How to calculate?

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



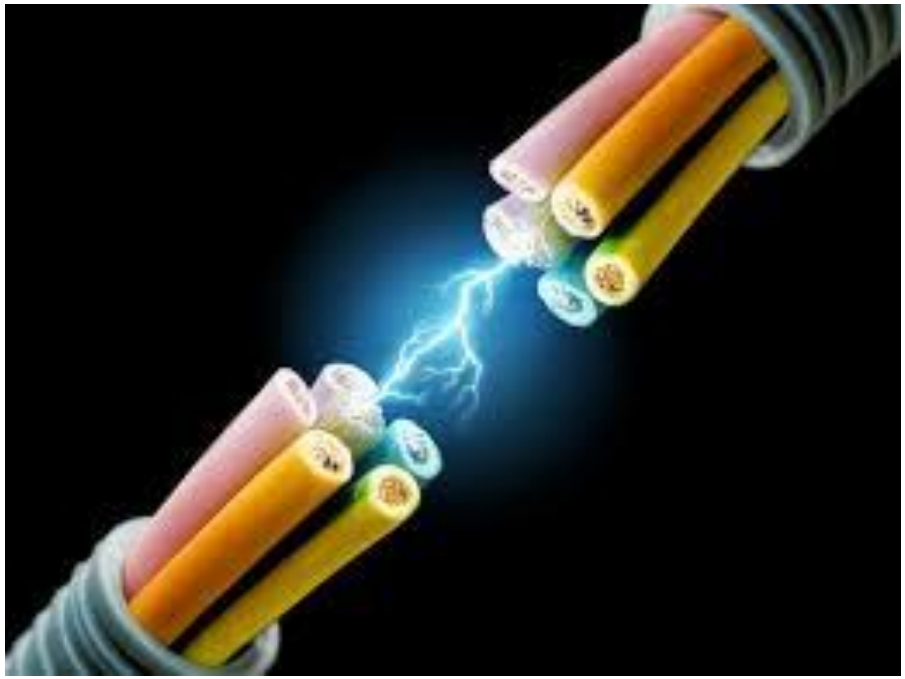
$$R = \frac{E}{I}$$

RESISTOR COLOR CHART



Resistor Color Code System

RECAP….



…THANK YOU