Basic Components

Muhammad Adeel

M.Sc. Electronics (KU)

M.Phil. ISPA (KU)

Passive Components

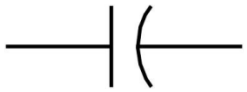
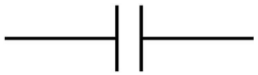
➢A passive component is a module that does not require energy to operate, except for the available alternating current (AC) circuit that it is connected to.

➢ A passive module is not capable of power gain and is not a source of energy.

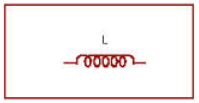
➢A typical passive component would be a:

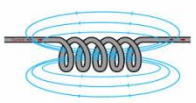
•Resistor


•Capacitor

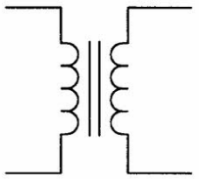
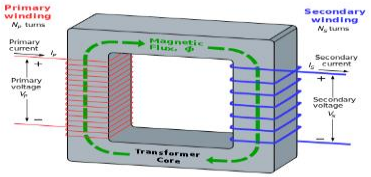



•Inductor



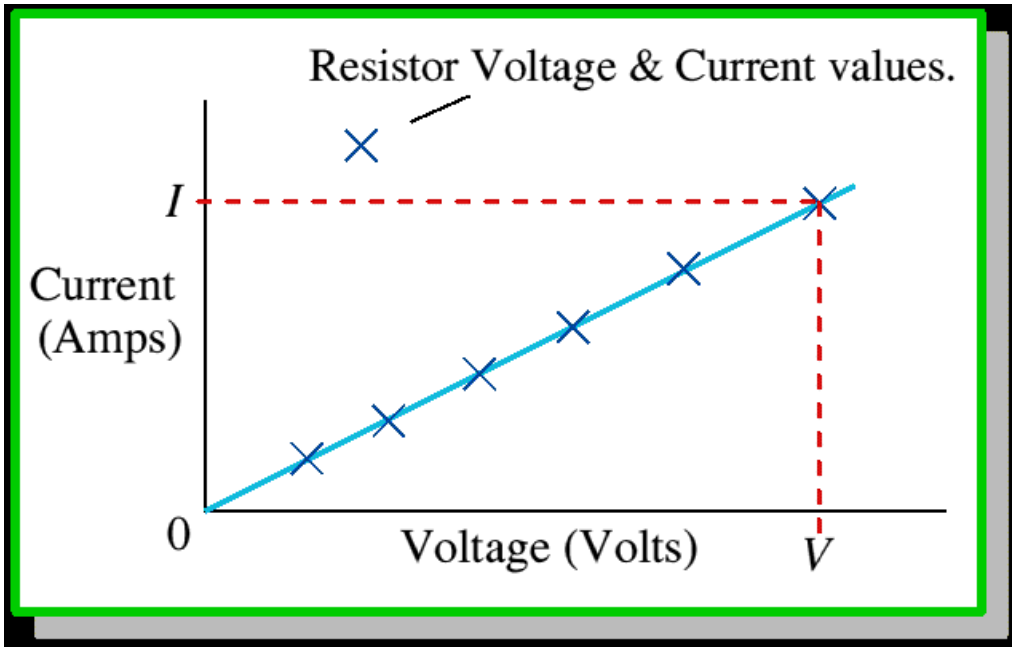

•Transformer

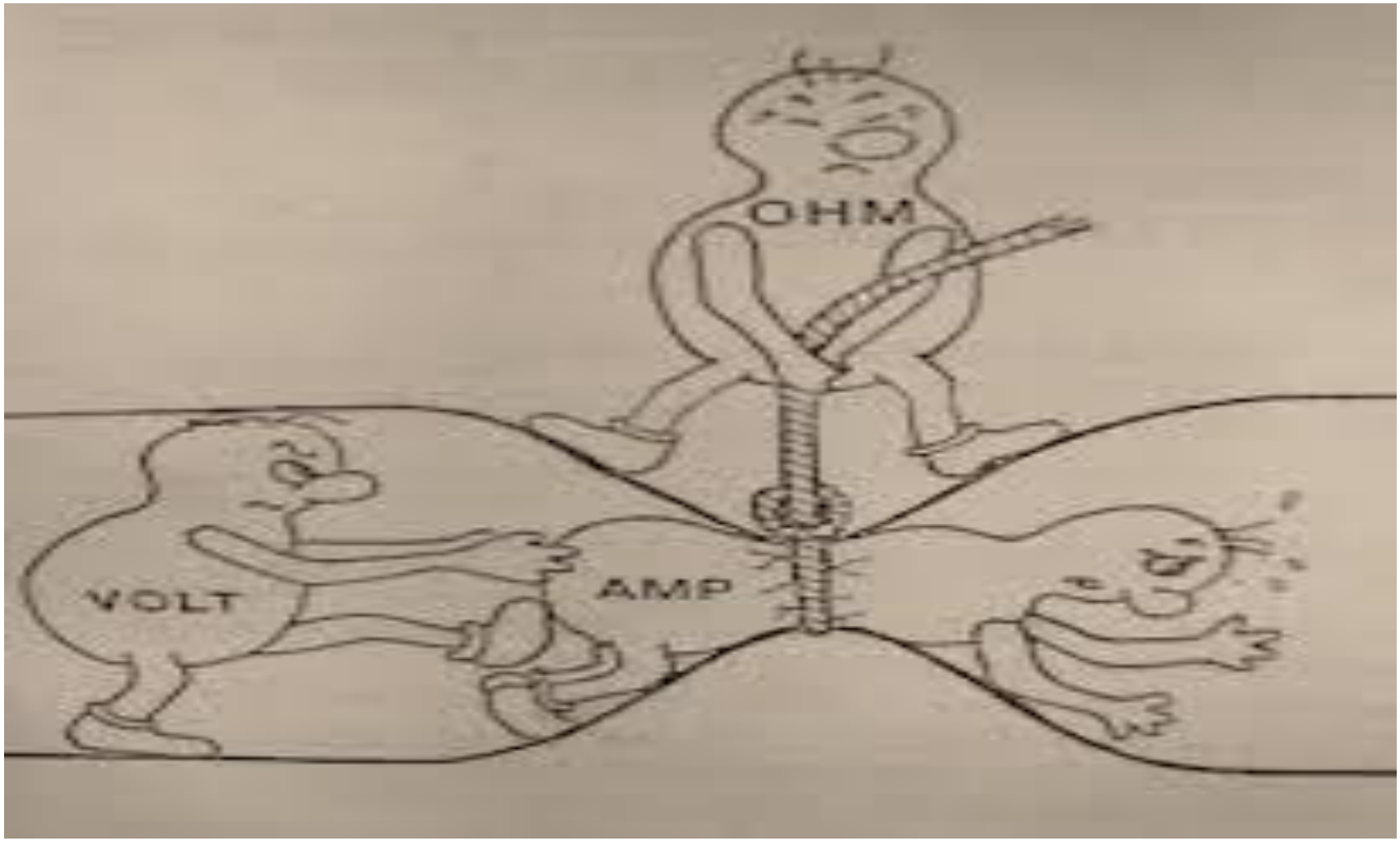



Ohm's Law

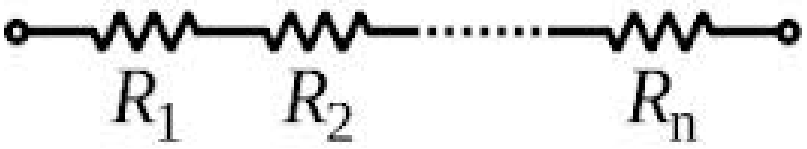
Ohm's law states that the **current** through a conductor between two points is directly proportional to the **potential difference** across the two points.

Introducing the constant of proportionality, the resistance, one arrives at the usual mathematical equation that describes this relationship.



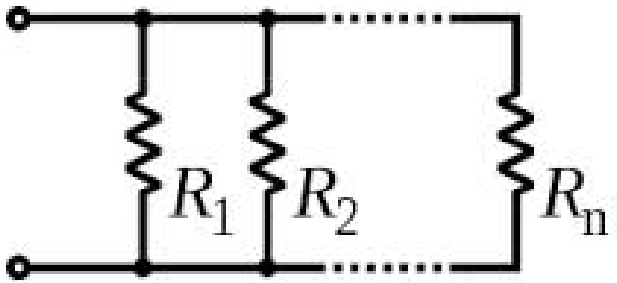

OHM
VOLT
AMP

Resistors in Series



$$R_{TOT} = R_1 + R_2 + R_3 \ldots \text{etc.}$$

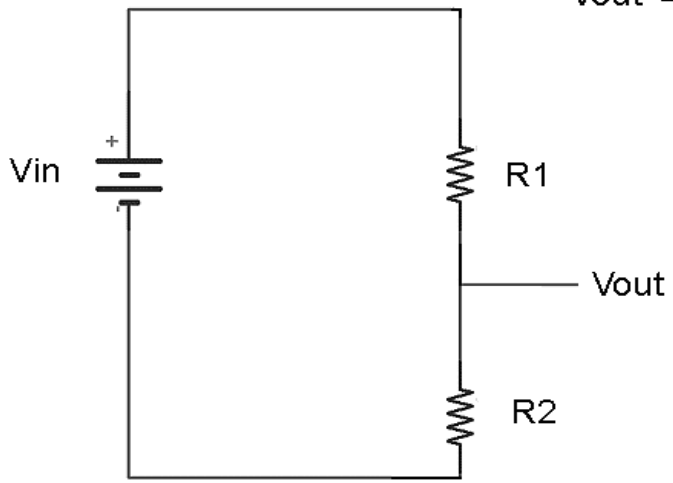
Resistors in Parallel



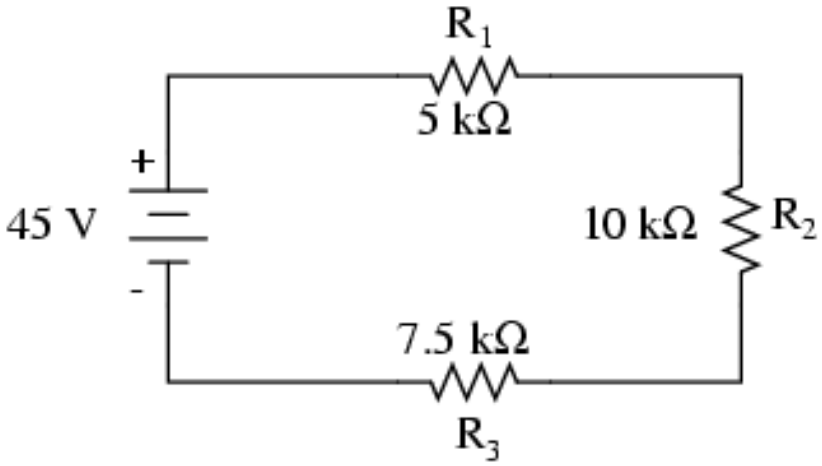
$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \ldots$$

Voltage Divider Rule

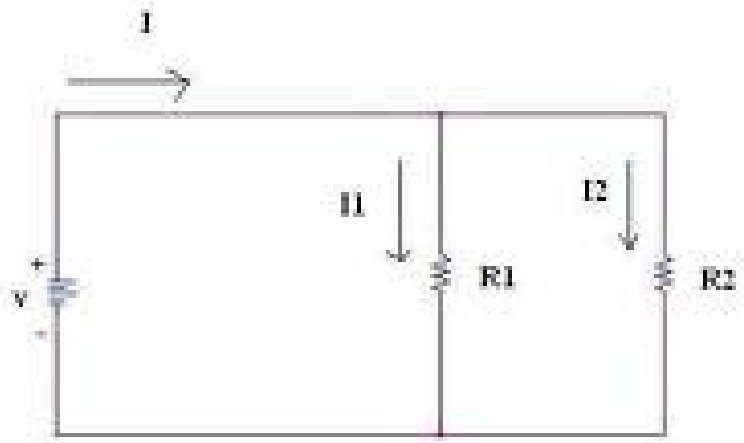
$$V_{out} = V_{in} \times \frac{R2}{R1+R2}$$



Solve this



Current Divider Rule



$$I_{output} = \frac{R_1}{R_1 + R_2} I_{input}$$