Electric Current/Electricity

- The flow of electrons through a conductor
- *Direction:* always opposite the electron flow
- It is measured in *Amperes (A)*
- *1 A:* 1 C/s or 1 electric charge/second

Electric Potential

- It is measured in *volts (V)*
- *1 V:* 1 J/C or 1 potential energy/unit charge

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Page 5 of 15

Electric Resistance

- It is measured in *ohms (Ω)*

Ohm's Law

- The voltage across the total circuit or any portion of the circuit is equal to the current times the resistance
- *Formulas:* V = IR; R = V/I; I = V/R

Two Basic Types of Electric Circuits

- Series & Parallel Circuits

Series Circuit

- All circuit elements are connected in a line along the same conductor

Rules for Series Circuit

- *DC:* induces no current in the secondary coil

Induction Motor

- A type of motor used with x-rays tubes
- It powers the rotating anode of an x-ray tube

Transformer Law

- The change in voltage is directly proportional to the ratio of the number of turns (*windings*) in the secondary coil (N_s) to the number of turns in the primary coil (N_p)
- *Formula:* $V_s/V_p = N_s/N_p$

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Page 14 of 15

Step-up Transformer

- Turns ratio greater than 1
- *Primary Side:* low voltage, high current
- *Secondary Side:* high voltage, low current

Step-down Transformer

- Turns ratio less than 1
- *Primary Side:* high voltage, low current
- *Secondary Side:* low voltage, high current

Transformer Law Effect on Current

- A change in current & a change in voltage are inversely related
- Formula: $I_s/I_p = N_p/N_s = V_p/V_s$

Types of Transformer