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Ch 2

$V = \frac{W}{Q}$ Voltage

V = volts (V)

W = Joules (J)

Q = Coulombs (C)

$I = \frac{Q}{t}$ current

I = amperes (A)

Q = coulombs (C)

t = time (S)

$\text{Life (hours)} = \frac{\text{ampere hour rating (Ah)}}{\text{ampere drawn (A)}}$

Ch 3

$R = \rho \frac{L}{A}$ Resistance

ρ = ohm-centimeters ($\Omega \cdot cm$)

L = centimeters (cm)

A = square centimeters (cm^2)

R = ohm (Ω)

$G = \frac{1}{R}$ conductance

G = siemens (S)

R = ohm (Ω)

Ch 4

OHM'S LAW

$\text{Current} = \frac{\text{potential difference}}{\text{resistance}}$

$I = \frac{E}{R}$ amperes (A) $R = \frac{E}{I}$ ohms (Ω)

$E = IR$ volts (V)

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Ch4

Power

$$P = \frac{W}{t} = \frac{QV}{t} = V\frac{Q}{t}$$

$$I = \frac{Q}{t} \rightarrow \boxed{P = VI} \text{ watts } (W)$$

$$P = VI = V\left(\frac{V}{R}\right) \rightarrow \boxed{P = \frac{V^2}{R}}$$

$$P = VI = (IR)I \rightarrow \boxed{P = I^2R}$$

1 watts = 1 joule/second (J/s)

Energy

$W = Pt$

↳ W.s or J

Wh = Power(w) x time(h) (Energy)

$$kWh = \frac{\text{Power}(w) \times \text{time}(h)}{1000} \quad \text{(Energy)}$$

Ch5

Series Resistors

$$R_T = R_1 + R_2 + \dots$$

Power Distribution

$P_E = E I_s$ watts W

$$P_1 = V_1 I_1 = I_1^2 R_1 = \frac{V_1^2}{R_1}$$

$$P_E = P_{R_1} + P_{R_2} + \dots$$

Source Current or Total Current

$$I_s = \frac{E}{R_T}$$

Kirchhoff's Voltage law

$$\sum_c V = 0 \qquad \sum_c V_{rises} = \sum_c V_{drops}$$

Voltage Divider Rule

$$V_x = R_x \frac{E}{R_T}$$

Single Subscript

~~Double Subscript~~

$V_{ab} = V_a - V_b$

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Ch 6

Parallel Resistors

$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \cdots$$

$$R_T = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \cdots}$$

$$G_T = G_1 + G_2 + \cdots$$

$$R_T = \frac{R}{N}$$

When Resistors are the same Value

$$R_T = \frac{R_1 R_2}{R_1 + R_2}$$

When you have Two Parallel Resistors

Kirchhoff's current law

$$\sum I_i = \sum I_o$$

Current Divider Rule: Two Parallel Resistors

$$I_1 = \left(\frac{R_2}{R_1 + R_2}\right) I_2$$