

Area Of Study 1, Electric Power, Formula Sheet

Electronics Formulæ

Current: $I = \frac{q}{t}$

Voltage: $V = \frac{W}{q}$

Ohm's Law: $R = \frac{V}{I} \rightarrow V = IR \rightarrow I = \frac{V}{R}$

Total Series Resistance: $R_T = R_1 + R_2 + R_3 \dots + R_n$

Total Parallel Resistance: $R_T = (R_1^{-1} + R_2^{-1} + R_3^{-1} \dots + R_n^{-1})^{-1}$

Parallel Current: $I_T = I_1 + I_2 + I_3$

Parallel Voltage: $V_T = V_1 = V_2 = V_3$

Kirchoff's Current Law: $I_{in} = I_{out}$

Series Current: $I_T = I_1 = I_2 = I_3$

Series Voltage: $V_T = V_1 + V_2 + V_3$

Kirchoff's Voltage Law: $V_{supply} = V_{R_1} + V_{R_2} + V_{R_3}$

Power: $P = \frac{E}{t} = VI = I^2R = \frac{V^2}{R}$

Magnetism And Electromagnetism Formulæ

$$\phi_B = BA \cos \theta \rightarrow \phi_B = BA \text{ [if } \theta = 0]$$

$$F = BIl \sin \theta \rightarrow F = BIl \text{ [if } \theta = 90]$$

$$F = Bqv \sin \theta \rightarrow F = Bqv \text{ [if } \theta = 90]$$

Electromagnetic Induction Formulæ

$$\varepsilon = \frac{-\Delta\phi_B}{\Delta t}$$

$$\varepsilon = N \frac{-\Delta\phi_B}{\Delta t}$$

$$\varepsilon = -Blv$$

$$\varepsilon_{\max} = NBA2\pi f$$

Transformer Formulæ

$$\frac{N_S}{N_P} = \frac{V_S}{V_P}$$

$$\frac{N_S}{N_P} = \frac{I_P}{I_S}$$

$$P_P = P_S \rightarrow V_P I_P = V_S I_S$$

Power Transmission Formulæ

Peak & RMS Voltage

$$V_{RMS} = \frac{V_{peak}}{\sqrt{2}}$$

$$V_{peak} = \sqrt{2} \times V_{RMS}$$

Power Loss

$$P_{loss} = I_{line}^2 R_{line}$$
