P12 - 0-0 - Formula Sheet

Circular Motion

$\vec{F}_c = m\vec{a}_c$ $\quad \vec{a}_c = \frac{\vec{v}^2}{r}$ $\quad \vec{F}_c = m\frac{\vec{v}^2}{r}$ $\quad \vec{v} = \frac{2\pi r}{T}$ $\quad \vec{F}_c = m\frac{4\pi^2 r}{T^2}$ $\quad \vec{a}_c = \frac{4\pi^2 r}{T^2}$

Rotational Motion AP

$a = \theta r$ $\quad \boldsymbol{\omega} = \frac{\theta}{t}$ $\quad \alpha = \frac{\boldsymbol{\omega}}{\mathbf{t}}$ $\quad V_T = r\boldsymbol{\omega}$ $\quad \boldsymbol{\omega_f^2} = \boldsymbol{\omega_i^2} + \mathbf{2}\alpha\theta$

Electrostatics

$\vec{F} = \frac{kQ_1Q_2}{r^2}$ $\quad \vec{E} = \frac{kQ}{r^2}$ $\quad E_p = \frac{kQ_1Q_2}{r}$ $\quad V = \frac{kQ}{r}$

$\vec{F} = \vec{E}Q$ $\quad \Delta E_p = \Delta VQ$ $\quad V = \vec{E}r$

Plates

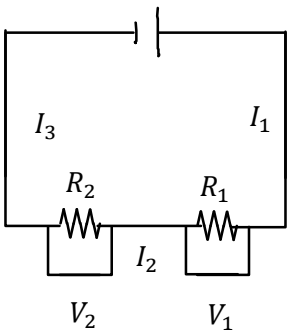
$\Delta E_p = \vec{F}d$

$\Delta V = \vec{E}d$

Electric Circuits

$V = IR$ $\quad I = \frac{Q}{t}$ $\quad P = IV$ $\quad v_{term} = \in -Ir_{int}$

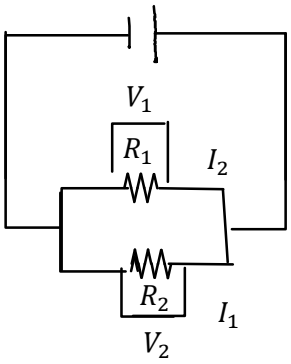
Series



$I_T = I_1 = I_2 = I_3 \ldots$
$V_T = V_1 + V_2 + V_3 \ldots$
$R_T = R_1 + R_2 + R_3 \ldots$

$R_1 = R_2^*$

Parallel



$V_T = V_1 = V_2 = V_3 \ldots$
$I_T = I_1 + I_2 + I_3 \ldots$
$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \ldots$

$R_T^* = \frac{R_1R_2}{R_2 + R_2}$

Two Resistors$_{||}$

Electromagnetism/Induction

$\vec{F} = \vec{B}IL$ $\quad \vec{B} = \mu_0 nI = \mu_o \frac{N}{L} I = \frac{\mu_0 I}{2\pi r}$ $\quad \in = \vec{B}Iv$ $\quad \Phi = \vec{B}A$

$\vec{F} = Qv\vec{B}$ $\quad n = \frac{N}{L}$ $\quad V_{back} = \in -Ir$ $\quad \frac{V_s}{V_p} = \frac{N_s}{N_p} = \frac{I_p}{I_s}$

$\in = -N\frac{\Delta\Phi}{\Delta t}$

$F = \vec{B}ILsin\theta$
$F = Qv\vec{B}sin\theta$
$\Phi = \vec{B}Asin\theta$

Relativity

$E = mc^2$ $\quad t = \frac{t_o}{\sqrt{1 - \frac{\vec{v}^2}{c^2}}}$ $\quad L = L_o\sqrt{1 - \frac{\vec{v}^2}{c^2}}$ $\quad m = \frac{m_o}{\sqrt{1 - \frac{\vec{v}^2}{c^2}}}$ $\quad \vec{v}' = \frac{u + \vec{v}}{1 + \frac{u\vec{v}}{c^2}}$

Heat $\quad Q = mc\Delta T$ $\quad Q = mH$ $\quad \Delta Q = -\Delta Q$