

FORMULARIO FISICA DOS

$$\begin{aligned} k &= \frac{1}{4\pi\epsilon_0} = 9 \times 10^9 N \frac{m^2}{C^2} & N_A &= 6.022141 \times 10^{23} \text{átomos/mol} \\ \epsilon_0 &= 8.8542 \times 10^{-12} \frac{C^2}{Nm^2} & e &= 1.6022 \times 10^{-19} C \\ m_e &= 9.1094 \times 10^{-31} Kg & m_p &= 1.6726 \times 10^{-27} Kg \\ m_n &= 1.67491 \times 10^{-27} Kg & eV &= 1.6022 \times 10^{-19} J \end{aligned}$$

$$\mu_o = 4\pi \times 10^{-7} Tm/A$$

Campo Eléctrico y Fuerza Eléctrica

$$\begin{aligned} \vec{F} &= \frac{kq_1q_2}{r^2} \hat{r} & \vec{F}_T &= \sum \vec{F} \\ \vec{E} &= \frac{\vec{F}}{q_o} & \vec{E} &= \frac{kq}{r^2} \hat{r} & \vec{E} &= \int \frac{k dq}{r^2} \hat{r} \\ dq &= \lambda dl & dq &= \sigma dA & dq &= \rho dV \end{aligned}$$

$$E = \frac{\sigma}{\epsilon_0} \quad E = \frac{\sigma}{2\epsilon_0}$$

Dipolo eléctrico

$$p = lq \quad \tau = pE \sin \theta \quad \vec{\tau} = \vec{p} \times \vec{E} \quad U = -\vec{p} \cdot \vec{E} = -pE \cos \theta$$

Flujo eléctrico

$$\Phi_E = \vec{E} \cdot \vec{A} = EA \cos \theta \quad \Phi_E = \oint \vec{E} \cdot d\vec{A} \quad \oint \vec{E} \cdot d\vec{A} = \frac{q_{encerrada}}{\epsilon_0}$$

Energía Potencial Eléctrica

$$U = \frac{kq_1q_2}{r} \quad U_{sistema} = \sum U \quad W = -\Delta U$$

Potencial Eléctrico

$$\begin{aligned} V &= \frac{U}{q} & V &= \int \frac{k dq}{r} & V &= \frac{kq}{r} & V_T &= \sum V \\ \Delta V &= -\int \vec{E} \cdot d\vec{l} \\ E_x &= -\frac{dV}{dx} & E_r &= -\frac{dV}{dr} & \vec{E} &= -\nabla V \end{aligned}$$

CAPACITANCIA

$$\begin{aligned} C &= \frac{Q}{\Delta V} & \text{placas paralelas } C &= \frac{\epsilon_0 A}{d} \\ \text{esférico } C &= \frac{ab}{k(b-a)} & \text{cilíndrico } C &= \frac{l}{2k \ln(\frac{b}{a})} \\ \text{Serie } \frac{1}{C_{eq}} &= \frac{1}{C_1} + \frac{1}{C_2} + \dots + \frac{1}{C_n} \\ \text{Paralelo } C_{eq} &= C_1 + C_2 + \dots + C_n \\ U &= \frac{Q^2}{2C} = \frac{1}{2} C \Delta V^2 \end{aligned}$$

$$\begin{aligned} \text{dieléctricos } C &= KC_o & C &= \frac{K\epsilon_0 A}{d} & \Delta V &= \frac{\Delta V_o}{K} \\ \int \int \vec{E} \cdot d\vec{A} &= \frac{q_{encerrada}}{\epsilon} & \epsilon &= K\epsilon_0 \end{aligned}$$

CORRIENTE, RESISTENCIA

$$\begin{aligned} I &= \frac{\Delta Q}{\Delta t} & I &= \frac{dq}{dt} & I &= nqA\vec{v} \\ J &= \frac{I}{A} & \vec{J} &= nq\vec{v}_d & V &= IR \\ R &= \frac{\rho L}{A} & \rho &= \frac{E}{J} \\ \rho(T) &= \rho_o [1 + \alpha(T - T_o)] \\ P &= VI & P &= Ri^2 & P &= \frac{V^2}{R} \\ \text{resistencias en serie} & R_{eq} = R_1 + R_2 + \dots + R_n \\ \text{resistencias en paralelo} & \frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \dots + \frac{1}{R_n} \end{aligned}$$

CIRCUITOS DE CORRIENTE CONTINUA

$$\begin{aligned} \text{Leyes de Kirchhoff} & \sum_{nodo} I_{entran} = 0 & \sum_{malla} \Delta V &= 0 \\ \text{circuito simple RC carga} & q(t) = CV(1 - e^{-\frac{t}{RC}}) \\ i &= \frac{V}{R}e^{-\frac{t}{RC}} = I_o e^{-\frac{t}{RC}} & V_C &= V(1 - e^{-\frac{t}{RC}}) \\ \text{Descarga} & i = \frac{V_o}{R}e^{-\frac{t}{RC}} & q(t) &= Q_o e^{-\frac{t}{RC}} \end{aligned}$$

MAGNETISMO

$$\begin{aligned} \vec{F} &= q\vec{v} \times \vec{B} \\ \text{Fuerza de Lorentz} & \vec{F} = q\vec{E} + q\vec{v} \times \vec{B} \\ F &= I\vec{l} \times \vec{B} & \sum F &= m\frac{v^2}{R} \\ \vec{\tau} &= \vec{\mu} \times \vec{B} & \vec{\mu} &= NiA\hat{n} & \tau &= \mu B \sin\theta \\ U &= -\vec{\mu} \cdot \vec{B} = -\mu B \cos\theta \end{aligned}$$

FUENTES DE CAMPO MAGNÉTICO

$$\begin{aligned} \text{Ley de Biot-Savart} & \vec{B} = \frac{\mu_o I}{4\pi} \int \frac{d\vec{l} \times \vec{r}}{r^2} \\ \text{Ley de Ampere} & \oint \vec{B} \cdot d\vec{l} = \mu_o i_{enc} \\ \mu_o &= 4\pi \times 10^{-7} Tm/A & \text{Conductor largo} & B = \frac{\mu_o I}{2\pi r} \\ \text{Solenoides} & B = \mu_o nI & n &= \frac{\#vueltas}{Longitud} \\ \text{Ley de Gauss} & \oint \vec{B} \cdot \hat{n} dA = 0 & \varepsilon &= -N \frac{d\Phi_B}{dt} & \Phi_B &= \oint \vec{B} \cdot \hat{n} dA \\ \varepsilon &= \oint \vec{E} \cdot d\vec{l} \\ \text{INDUCTANCIA} & \varepsilon = -L \frac{di}{dt} & L &= \frac{N\Phi_B}{i} & U &= \frac{1}{2} LI^2 \end{aligned}$$