Física 3 – Engenharia de Telecomunicações - Formulário 1

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$|e|=1{,}6.10^{-19}\,C$ $\quad Q=n.e$ $\quad (Q_{total})_{antes}=(Q_{total})_{depois}$ $\quad |\vec{F}|=\frac{k.|Q_1|.|Q_2|}{r^2}$ $\quad E_p=\frac{k.Q_1.Q_2}{r^2}$

$U_{total}=U_{12}\pm U_{12}\pm U_{21}\pm\ldots$ $\quad \vec{F}_r=\vec{F}_1+\vec{F}_2+\ldots$ $\quad k=\frac{1}{4\pi\varepsilon_0}$ $\quad K_0=9.10^9\,Nm^2/C^2$ $\quad \varepsilon_0=8{,}85.10^{-12}\,C^2/Nm^2$

$\vec{F}=q.\vec{E}$ $\quad |\vec{E}|=\frac{k.Q}{r^2}$ $\quad \vec{E}_r=\vec{E}_1+\vec{E}_2+\ldots$ $\quad \vec{F}_r=m.\vec{a}$ $\quad a=\frac{\Delta v}{\Delta t}$ $\quad V=V_0+a.t$ $\quad V^2=V_0^2+2.a.\Delta x$

$X=X_0+V_0t+\frac{at^2}{2}$ $\quad v=\frac{\Delta x}{\Delta t}$ $\quad \lambda=\frac{Q}{L}$ $\quad \sigma=\frac{Q}{A}$ $\quad \rho=\frac{Q}{V}$ $\quad V_{esfera}=\frac{4}{3}\pi R^2$ $\quad A_{esfera}=4\pi R^2$

$V_{cilindro}=\pi R^2 L$ $\quad A_{lateralCilindro}=2\pi R L$ $\quad A_{circulo}=\pi R^2$ $\quad E=\frac{k.Q}{d^2-\frac{L^2}{4}}$ $\quad E=\frac{2k\lambda}{r}$ $\quad E=\frac{k.Q.x}{(x^2+R^2)^{\frac{3}{2}}}$

$E_y=-\frac{k.\lambda}{R}(\cos(\theta_1)-\cos(\theta_2))$ $\quad E_y=\frac{k.Q}{L.y}(\mathrm{sen}(\theta_2)-\mathrm{sen}(\theta_1))$ $\quad E=2\pi k\sigma\left(1-\frac{1}{\sqrt{1+\frac{R^2}{x^2}}}\right)$

$E_x=-\frac{k.\lambda}{R}(\mathrm{sen}(\theta_2)-\mathrm{sen}(\theta_1))$ $\quad E_x=-\frac{k.Q}{L.y}(\cos(\theta_1)-\cos(\theta_2))$

$E=2\pi k\sigma\left(\frac{1}{\sqrt{1+\left(\frac{R_1}{x}\right)^2}}-\frac{1}{\sqrt{1+\left(\frac{R_2}{x}\right)^2}}\right)$ $\quad \phi_E=\int_S \vec{E}\,d\vec{A}$ $\quad \phi_E=E.A.\cos(\theta)$ $\quad E=2\pi k\sigma$ $\quad E=4\pi k\sigma$

$\Delta E=4\pi k\sigma$ $\quad E_{prox}=4\pi k\sigma$ $\quad \phi_E=\vec{E}.\vec{A}$ $\quad \oint \vec{E}.d\vec{A}=\frac{q_{int}}{\varepsilon_0}$

$\vec{E}.d\vec{A}=E.dA.\cos(\theta)$ $\quad \vec{E}.d\vec{A}=E_x dA_x+E_y dA_y+E_z dA_z$ $\quad V=\frac{k.Q}{r}$ $\quad W_{el}=-\Delta E_{pe}=-(E_{pf}-E_{pi})$

$E=\frac{2kp}{x^3}.\left(\frac{1}{\left(1-\left(\frac{d}{2x}\right)^2\right)^2}\right)$ $\quad p=g.d$ $\quad E_{pe}=q.V$ $\quad W_{ef}=-q.\Delta V$ $\quad \Delta V=V_f-V_i$ $\quad V_{total}=V_1+V_2+V_3+\ldots$

$E\approx\frac{2kp}{x^3}$ $\quad E\approx\frac{kp}{y^3}$ $\quad E=\frac{k.p}{\left(\frac{d^2}{4}+y^2\right)^{\frac{3}{2}}}$ $\quad V\approx\frac{k.p.\cos(\theta)}{r^2}$ $\quad \vec{\tau}=\vec{p}\times\vec{E}$ $\quad |\vec{\tau}|=p.E\,\mathrm{sen}(\theta)$

$E_{pe}=-\vec{p}.\vec{E}$ $\quad E_{pe}=-p.E.\cos(\theta)$ $\quad \Delta V=-\int\vec{E}.d\vec{x}$ $\quad \Delta V=-\int\vec{E}.d\vec{r}$ $\quad \Delta V=-\left[\int E_x dx+\int E_y dy+\int E_z dz\right]$

$\vec{E}=-\frac{dv}{dx}\hat{i}$ $\quad \vec{E}=-\frac{dv}{dr}\hat{r}$ $\quad \vec{E}=-\left(\frac{dv}{dx}\hat{i}+\frac{dv}{dy}\hat{j}+\frac{dv}{dz}\hat{k}\right)=-\vec{\nabla}v$ $\quad \Delta v=-E.\Delta x$

$$V=-\frac{k.Q}{L}.\ln\left(\frac{x-\frac{L}{2}}{x+\frac{L}{2}}\right) \quad V=2.k.\lambda.\ln\left(\frac{r_{ref}}{r}\right) \quad v=k.\lambda.\ln\left(\frac{\sec(\theta_2)+tg(\theta_2)}{\sec(\theta_1)+tg(\theta_1)}\right) \quad V=k.\lambda.(\theta_2-\theta_1)$$

$$V=\frac{k.\lambda R.\alpha}{\sqrt{x^2+R^2}} \quad V=\frac{k.Q}{\sqrt{x^2+R^2}} \quad V=2k\pi\sigma.\left(\sqrt{x^2+R_2^2}-\sqrt{x^2+R_1^2}\right) \quad V=\frac{2kQ}{R^2}.\left(\sqrt{x^2+R^2}-x\right)$$

$$tg(\theta)=\frac{sen(\theta)}{\cos(\theta)} \quad \cos(\theta)=\frac{C.A.}{hipotenusa} \quad sen(\theta)=\frac{C.O.}{hipotenusa}$$

$$cotg(\theta)=\frac{1}{tg(\theta)} \quad \sec(\theta)=\frac{1}{\cos(\theta)} \quad cossec(\theta)=\frac{1}{sen(\theta)}$$

$$E=\frac{\rho.r}{3\varepsilon_0} \quad E=\frac{\rho.r}{2\varepsilon_0} \quad V=\frac{\rho}{2\varepsilon_0}\left[\frac{R^2-r^2}{2}+R^2.\ln\left(\frac{r_{ref}}{R}\right)\right] \quad E=\frac{\rho}{3\varepsilon_0}.\frac{(r^3-R_1^3)}{r^2} \quad V=\frac{\rho}{3\varepsilon_0}.\left(\frac{R^2-r^2}{2}\right)+\frac{k.Q}{R}$$

$$E=\frac{\rho}{2\varepsilon_0}.\frac{(r^2-R_1^2)}{r} \quad V=\frac{\rho}{3\varepsilon_0}.\left[\frac{1}{2}.(R_2^2-r^2)-R_1^3.\left(\frac{1}{r}-\frac{1}{R_2}\right)+\frac{1}{R_2}.(R_2^3-R_1^3)\right]$$

$$V=\frac{\rho}{2\varepsilon_0}.\left[\frac{(R_2^2-r^2)}{2}-R_1^2\ln\left(\frac{R_2}{r}\right)+(R_2^2-R_1^2).\ln\left(\frac{r_{ref}}{R_2}\right)\right]$$