

Respostas dos Exercícios - Lista XI

Física III

1º Semestre de 2017

1. a) $\vec{B}(\rho < r_1) = \vec{B}(\rho > r_2) = 0$; $\vec{B}(r_1 < \rho < r_2) = \frac{\mu_o I}{2\pi\rho} \hat{\theta}$

b) $u_m = \frac{\mu_o I^2}{8\pi^2 \rho^2}$ c) $U_\ell = \frac{\mu_o I^2}{4\pi} \ln\left(\frac{r_2}{r_1}\right)$

d) $\mathcal{L} = \frac{\mu_o}{2\pi} \ln\left(\frac{r_2}{r_1}\right)$

2. a) $M = \frac{\mu_o b}{2\pi} \ln\left(\frac{2L+a}{2L-a}\right)$ b) $M = \frac{\mu_o b}{\pi} \ln\left(\frac{d+a}{d-a}\right)$

3. a) Nos dois casos o sinal $\ddot{u}_{\frac{1}{2}}$ negativo. (ERRATA: Desconsiderar o “por quê?” entre parênteses)

b) $L' = L_1 + L_2 + 2M$ c) $L'' = L_1 + L_2 - 2M$

4. a) $\epsilon = \omega AB \sin(\omega t)$ b) $I = \frac{\omega AB \sin(\omega t - \varphi)}{\sqrt{R^2 + (\omega L)^2}}$, $\tan \varphi = \frac{\omega L}{R}$

5. a) $\text{Pot}(R) = \frac{1}{R\epsilon^2} \left[\epsilon^2 - R_1 \left(\frac{R(R_1 + R_2) + R_1 R_2}{R + R_2} \right) \right]^2$; $R = 15\Omega$

b) A energia fornecida pela bateria $\ddot{u}_{\frac{1}{2}}$: $\epsilon^2 C$

c) $V_c(t) = \frac{\epsilon}{2} (1 - e^{-\frac{2}{RC}t})$