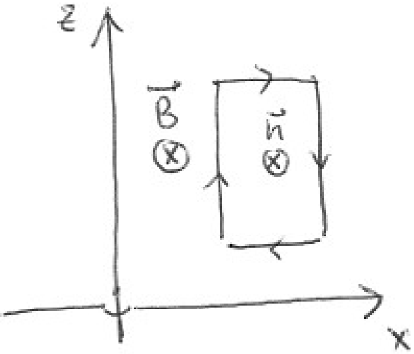
3º Teste E e O 8/6/2007

VERSÃO A Soluções

I

a) $\boxed{\vec{B} = \frac{\mu_0}{2\pi} I_0 \cos\omega t \, \frac{1}{x} \, \vec{e}_y}$

b) $\vec{n} \parallel \vec{B} \Rightarrow \boxed{\Phi(t) = \frac{\mu_0}{2\pi} I_0 \cos(\omega t) \, 2a \ln(2)}$

c) 

$$\mathcal{E} = -\frac{d\Phi}{dt} = \frac{\mu_0}{2\pi} I_0 \omega \sin(\omega t) \, 2a \ln(2)$$

$$IR = \mathcal{E} \Rightarrow \boxed{I = \frac{\mu_0}{2\pi} \frac{I_0}{R} \omega \sin(\omega t) \, 2a \ln 2}$$

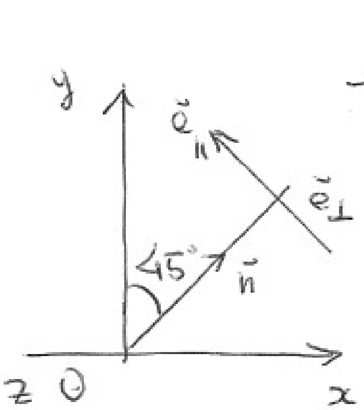
$0 < \omega t < \pi/2 \Rightarrow \sin \omega t > 0 \Rightarrow I > 0 \Rightarrow$ sentido indicado.

II

a) $\vec{k} = \alpha \vec{e}_x + \beta \vec{e}_y \Rightarrow \vec{k} \cdot \vec{E} = 0 \Rightarrow E_0 \cos[\cdot\cdot](-\alpha + \beta) = 0$

Logo $\boxed{\alpha = \beta = \sqrt{2} \times 10^{-2} \, m^{-1}}$

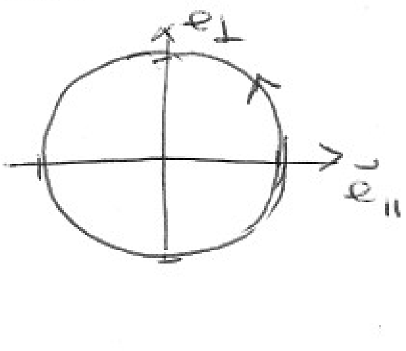
b) $\vec{n} = \frac{1}{\sqrt{2}} \vec{e}_x + \frac{1}{\sqrt{2}} \vec{e}_y$

c) 

& $\vec{e}_\perp = \vec{e}_z$; $\vec{e}_\parallel = -\frac{1}{\sqrt{2}} \vec{e}_x + \frac{1}{\sqrt{2}} \vec{e}_y$

$\vec{E} = E_\perp \vec{e}_\perp + E_\parallel \vec{e}_\parallel$ com

$$\begin{cases} E_\perp = \sqrt{2} E_0 \sin[\cdot\cdot] \\ E_\parallel = \sqrt{2} E_0 \cos[\cdot\cdot] \end{cases}$$



$\boxed{\text{polarização circular esquerda}}$