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1. $\lambda = 25\ cm = 0{,}25$ $\quad \sigma = 0$

$A_0 = 50\ V/m$ $\quad \mu = \mu_0$

$v = 2 \times 10^8\ m/s$

$$f = \frac{v}{\lambda} = \frac{2 \times 10^8}{0{,}25} = 8 \times 10^8\ Hz = 800\ MHz$$

$$v = \frac{c}{\sqrt{\mu_r \varepsilon_r}} \qquad \beta = \frac{\omega}{v}$$

$$2 \times 10^8 = \frac{3 \times 10^8}{\sqrt{1 \cdot \varepsilon_r}} \qquad \beta = \frac{2\pi f}{8 \times 10^8}$$

$$\sqrt{\varepsilon_r} = \frac{3}{2} \qquad \beta = \frac{\pi \cdot 8 \times 10^8}{10^8} = 8\pi$$

$$\varepsilon_r = \frac{9}{4} = 2{,}25 \qquad \hat{a}_z \times -\hat{a}_y = \hat{a}_x$$

$$E(x,t) = A_0 \cos(\omega t - \beta x)\ \hat{a}_z\ V/m$$

$$E(x,t) = 50 \cos(2\pi \cdot 8 \times 10^8 t - 8\pi x)\ \hat{a}_z\ V/m$$

$$\eta = 377\sqrt{\frac{\mu_r}{\varepsilon_r}} = 377\sqrt{\frac{1}{\frac{9}{4}}} = 377 \cdot \frac{2}{3} = 251{,}33$$

$$H(x,t) = \frac{A_0}{\eta} \cos(\omega t - \beta x)\ (-\hat{a}_y)\ A/m$$

$$= \frac{50}{251{,}33} \cos(2\pi \cdot 8 \times 10^8 t - 8\pi x)\ (-\hat{a}_y)\ A/m$$

$$= -0{,}199 \cos(16\pi \times 10^8 t - 8\pi x)\ \hat{a}_y\ A/m$$