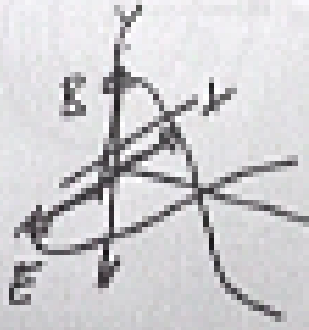
220

12:35 - 1:50

TEM

$$\begin{bmatrix} \vec{E} \\ \vec{B} \end{bmatrix} = \begin{bmatrix} E_m \\ B_m \end{bmatrix} \cos(kz - \omega t) \begin{bmatrix} \hat{x} \\ \hat{y} \end{bmatrix}$$



$$\frac{E}{B} = c$$

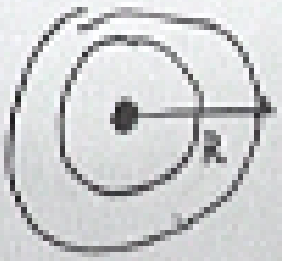
$$c = \frac{1}{\sqrt{\varepsilon_0 \mu_0}}$$

$$\langle u \rangle = \frac{1}{2}\varepsilon_0 E_m^2 = \frac{B_m^2}{2\mu_0}$$

$$\vec{S} = \frac{1}{\mu_0} \vec{E} \times \vec{B}$$

$$\langle S \rangle = \frac{E_m B_m}{2\mu_0} \hat{r}$$

$$I = \langle S \rangle \cdot \hat{n} = c \langle u \rangle$$



$$I = \frac{\langle \text{Power} \rangle}{4\pi R^2}$$

P

$B = -\mu_0 \frac{J_0}{2}$

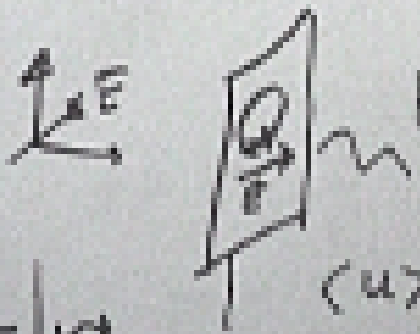
$J_s = J_0 \cos(\omega t)$

$B = -\mu_0 \frac{J_0}{2} \cos(\omega t)$

$\cos(kz - \omega t)$

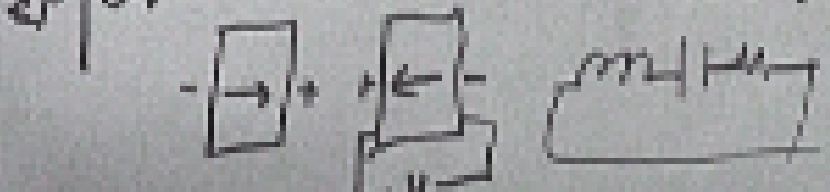
$\frac{E}{B} = c$

$E = -c\mu_0 \frac{J_0}{2} \cos(\omega t)$

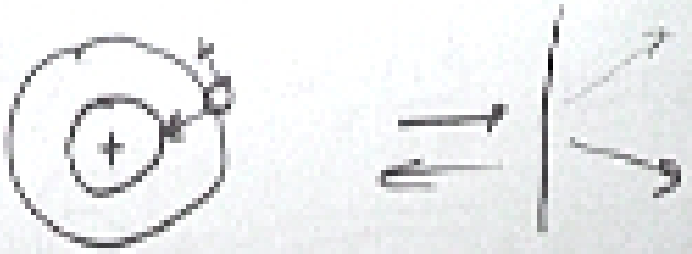


$F = qE$

$\langle u \rangle = \frac{1}{2} \langle u \rangle_{max}$



$$\frac{1}{\lambda} = R_\infty \left[\frac{1}{n^2} - \frac{1}{n^2}\right]$$



$$F = k\frac{q_1 q_2}{r^2} = k\frac{e^2}{r^2}$$

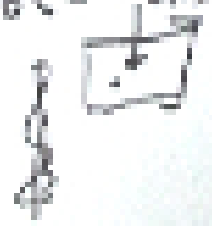
$$F = m_e\frac{v^2}{r} < \frac{mr^2}{mr^2}$$

$$\vec{L} = \vec{R}\times\vec{p} \quad L = rp = r m_e v$$

$$F = \frac{L^2}{m_e r^3}$$

$$k\frac{e^2}{r^2} = \frac{L^2}{m_e r^3} \leftarrow$$

a_0 ($L = \frac{h}{2\pi}$)



L, r : $L = \frac{nh}{2\pi}$ $n = 1, 2, \ldots$

$K = \frac{1}{2} m_e v^2$

$E_n = K + U$ $\quad U = -k\frac{e^2}{r}$

$$\Delta E = hf = \frac{hc}{\lambda} = E_{n=\infty} - E_n$$

$$E_n = -\frac{h^2}{8\pi^2 m_e n^2 a_0^2} \propto \frac{1}{n^2}$$

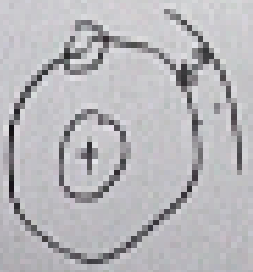
$$E_n = -\frac{E_\infty}{n^2}$$

$$\Delta E_{n\to 2} = E_\infty \left[\frac{1}{2^2} - \frac{1}{n^2}\right] = \frac{hc}{\lambda}$$

$$\frac{1}{\lambda} = \frac{E_\infty}{hc}\left[\frac{1}{2^2} - \frac{1}{n^2}\right] \quad R_\infty = 1.097 \times 10^7 \text{ m}^{-1}$$

q

R_∞



$a_c = \frac{v^2}{R}$