Field Components of TE Mode waves in Field Components of TM Mode waves Rectargular wave guide. in Rectangular Waveguide. Ex= jwy Ho (nth ) Cos (mth ) x. Sin (nth )y. e.  $E_{x} = \frac{-jB}{h^{2}} E_{0} \left(\frac{m\pi}{a}\right) C_{0} \left(\frac{m\pi}{a}\right) \times Sin\left(\frac{n\pi}{b}\right) y = 2$ Ey= -jwy Ho. (mt) . Sin (mt) . Cor (nt) y.e.  $E_{y} = \frac{-jB}{h^{2}} \cdot E_{0} \cdot \left(\frac{n\pi}{b}\right) Sin\left(\frac{m\pi}{a}\right) \times \cdot Cos\left(\frac{n\pi}{b}\right) y \cdot \frac{-ky}{2}$  $E_{z} = E_{o}$ .  $Sin\left(\frac{m\pi}{a}\right) \times . Sin\left(\frac{n\pi}{b}\right) y . e^{-\chi^{2} z}$ .  $E_{7}=0.$   $H_{x}=\frac{j\beta}{h^{2}}H_{0}(\alpha)Sin(\frac{m\pi}{a})x.Gs(\frac{n\pi}{b})y.e^{-st_{7}}.$  $H_{\chi} = \frac{j\omega \mathcal{E}_{e}}{h^{2}} E_{o} \cdot \mathcal{B}_{o} \left(\frac{n\pi}{b}\right) Sin\left(\frac{m\pi}{a}\right) \times G_{o} \left(\frac{n\pi}{b}\right) y \cdot e^{-\frac{3}{2}y}$ Hy=-jwee Eo (mt) Cos (mt) x. Sin (nt) yer. Hy= jB Ho(nb). Cos(mt)x. Sin(nt)y= x7.  $H_{z}=0$ .  $\beta=\beta'\left[1-\left(\frac{t_{c}}{t}\right)^{2}\right]$ .  $H_{z} = H_{o} \cdot Cos\left(\frac{m\pi}{a}\right) \times \cdot Cos\left(\frac{n\pi}{b}\right) y \cdot e^{-kz}$  $\eta = \eta'$   $1 - \left(\frac{\dagger c}{\dagger}\right)^2$   $\beta' = \frac{\omega}{u'}; \quad u' = \frac{1}{\mu \epsilon_e}$  $t_{c} = \frac{u'}{2} \left[ \frac{m}{a} \right]^{2} + \left( \frac{n}{b} \right)^{2} \left[ \frac{\lambda_{c} - u'}{b} \right] \left[ \frac{\lambda_{c} - u'}{a} \right] + \left( \frac{n}{b} \right)^{2},$   $v_{c} = \frac{u'}{a} \cdot \left( \frac{n}{b} \right)^{2} + \left( \frac{n}{b} \right)^{2},$   $v_{c} = \frac{u'}{a} \cdot \left( \frac{n}{b} \right)^{2} + \left( \frac{n}{b} \right)^{2},$