①

| Depto | : | INGENIERÍA EN ELECTRONICA |
|---|---|---|
| Materia | : | MEDIOS DE ENLACE |
| Alumno | : | Cáceres Mendoza, Elías Ariel | Curso: |
| Tema | : | | Legajo: | Fecha: 25/08/2014 |

1) $V = I\left(\frac{z_R + z_0}{2}\right)e^{\gamma d} + I\left(\frac{z_R - z_0}{2}\right)e^{-\gamma d}$

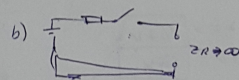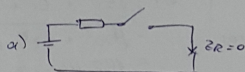$I = \frac{I}{z_0}\left(\frac{z_R + z_0}{2}\right)e^{\gamma d} - I\left(\frac{z_R - z_0}{2}\right)e^{-\gamma d}$

$z_i = \frac{V}{I} = \frac{I\left(\frac{z_R + z_0}{2}\right)e^{\gamma d} + I\left(\frac{z_R - z_0}{2}\right)e^{-\gamma d}}{\frac{I}{z_0}\left(\frac{z_R + z_0}{2}\right)e^{\gamma d} + \frac{I}{z_0}\left(\frac{z_R - z_0}{2}\right)e^{-\gamma d}} =$

$= z_0 \cdot \frac{z_R\left(e^{\gamma d} + e^{-\gamma d}\right) + z_0\left(e^{\gamma d} - e^{-\gamma d}\right)}{z_R\left(e^{\gamma d} - e^{-\gamma d}\right) + z_0\left(e^{\gamma d} + e^{-\gamma d}\right)} \Rightarrow$

$\boxed{\begin{array}{l} \text{Por } \alpha = 0 \\ \gamma = j\beta \end{array}}$

$= z_0 \cdot \frac{z_R \cdot 2\cos(\beta d) + j2\, z_0\,\text{sen}(\beta d)}{j2 z_R\,\text{sen}(\beta d) + z_0\, 2\cos\beta d} = z_0 \cdot \frac{z_R + j\, z_0\, tg(\beta d)}{z_0 + j\, z_R\, tg(\beta d)}$

$z_R - z_0$

$V = A_1\, e^{-\gamma L} + A_2\, e^{\gamma L}$

$I = \frac{A_1}{z_0}\, e^{-\gamma L} + \frac{A_2}{z_0}\, e^{\gamma L}$

$I_R\, z_R = A_1 + A_2\, e^{\gamma L}$
$I_R\, z_0 = A_1 - A_2\, e^{\gamma L}$

$I_R z_R - I_R z_0 = 2A_2\, e^{\gamma L}$
$I_R z_R + I_R z_0 = 2A_1\, e^{-\gamma L}$

$A_1 = \left(\frac{z_R + z_0}{2}\right)e^{\gamma L} \qquad L - x = d$

$A_2 = \left(\frac{z_R - z_0}{2}\right)e^{-\gamma L} \quad -(L-x) = -d$

Línea en cc : $z_R = 0$
Línea en CA : $z_R = \infty$

a) 

b)  $z_R \to \infty$

a) $z_i\Big|_{cc} = \frac{z_0 + j\, z_0\, tg\,\beta d}{z_0} = j\, z_0\, tg(\beta d) \qquad z_{in} = \frac{z_i}{z_0} = j\, tg(\beta d)$

$z_{in}\Big|_{0.130\lambda} = j\, tg\left(\frac{2\pi}{\lambda}\, 0.130\lambda\right) = \boxed{j\, 1.06}$

b) $z_{in}\Big|_{CA} = z_0 \cdot \frac{z_0}{j\, z_0\, tg(\beta d)} = -j\, \frac{1}{tg(\beta d)}$

$z_{in}\Big|_{CA} = -j\, \frac{1}{tg\left(\frac{2\pi}{\lambda}\, 0.155\lambda\right)} \approx \boxed{-j\, 0.68}$

$\lambda_{CA} = 0.25 + 0.155\lambda = \underline{\underline{0.405\,\lambda}}$