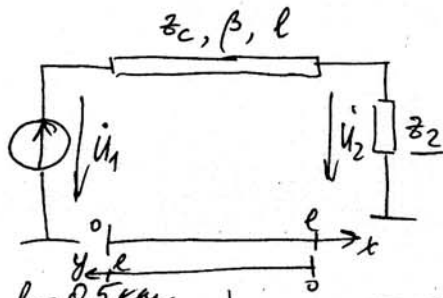


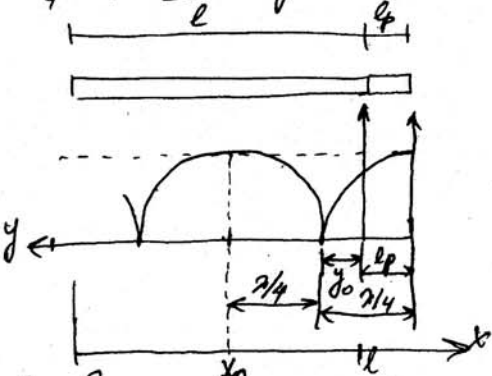
①



$l = 0,5 \text{ km}$
 $L_0 = 1 \frac{\text{H}}{\text{km}}$
 $C_0 = 1 \frac{\text{F}}{\text{km}}$
 $\omega = 10 \frac{\text{rad}}{\text{s}}$
 $U_1 = 10 \text{ V}$
 $y_0 = 0,02 \text{ km}$

- 1) $\underline{z}_2 = ?$
- 2) $u(x) = ?$

$\underline{z}_c = \sqrt{\frac{L_0}{C_0}} = \sqrt{\frac{1}{1}} = 1 (\Omega)$
 $\beta = \omega \sqrt{L_0 C_0} = 10 \sqrt{1 \cdot 1} = 10 \left(\frac{\text{rad}}{\text{km}}\right)$
 $\lambda = \frac{2\pi}{\beta} = \frac{2\pi}{10} = \frac{6,28}{10} = 0,628 (\text{km})$
 $\frac{\lambda}{4} = 0,157 (\text{km})$
 $y_0 < \frac{\lambda}{4} \Rightarrow \underline{z}_2 = -jx_c$



$l_p = \frac{\lambda}{4} - y_0 = 0,157 - 0,02 = 0,087 (\text{km})$

$\underline{z}_{in} = -jz_c \operatorname{ctg} \beta l_p = -j \cdot 1 \operatorname{ctg} (10 \cdot 0,087)$
 $= -j \frac{1}{\operatorname{tg} 0,87} = -j 0,8437 (\Omega)$
 $\underline{z}_2 = -jx_c$

$x_c = 0,8437 (\Omega)$
 $\underline{z}_2 = -j0,8437 (\Omega)$

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Jeejas pretestro vaoa krita sokumb:

1. variantas

$$\underline{Z_{in}} = Z_c \frac{Z_c + j Z_c \operatorname{tg} \beta l}{Z_c + j Z_c \operatorname{tg} \beta l} =$$

$$= 1 \frac{-j 0,8437 + j \cdot 1 \cdot \operatorname{tg}(10 \cdot 0,5)}{1 + j(-j 0,8437) \operatorname{tg}(10 \cdot 0,5)} =$$

$$= \frac{-j 0,8437 + j(-3,3805)}{1 + 0,8437(-3,3805)} = \frac{-j 4,2242}{1 - 2,8521} =$$

$$= \frac{-j 4,2242}{-1,8521} = j 2,2808 (\Omega)$$

2. variant

(3)

$$\begin{aligned} \underline{Z}_i &= -j Z_c \operatorname{ctg} \beta(l + l_p) = \\ &= -j 1 \frac{1}{\operatorname{tg}(\omega(0,5 + 0,087))} = \\ &= -j \frac{1}{\operatorname{tg} 5,87} = j 2,2809 \text{ (}\Omega\text{)} \end{aligned}$$

$$\underline{I}_1 = \frac{U_1}{Z_i} = \frac{10 e^{j0^\circ}}{j 2,2809} = -j 4,3842 \text{ (A)}$$

$U(x_0)$ = maksimuma srednjega efektivnog napona

$$x_0 = l - \frac{\lambda}{4} - y_0 = 0,5 - 0,157 - 0,07 = 0,273 \text{ (km)}$$

$$\underline{U}(x_0) = U_1 \cos \beta x_0 - j I_1 Z_c \sin \beta x_0 =$$

$$= 10 \cos(10 \cdot 0,273) - j(-j 4,3842) \cdot 1 \sin(10 \cdot 0,273) =$$

$$= 10(-0,9165) - 4,3842 \cdot 0,4001 =$$

$$= -9,165 - 1,7541 = -10,9191 =$$

$$= 10,9191 e^{j180^\circ} \text{ (V)}$$

