

① $U_n = 110 \text{ kV}$ $f = 50 \text{ Hz}$ $l_v = 50 \text{ km}$

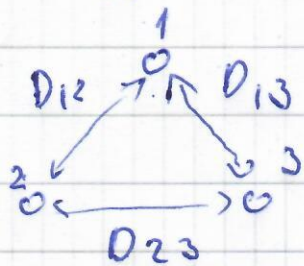
ALIFE 240/40

$a = 10,8 \text{ mm}$

$r_s = 9 \text{ mm}$

$R_1 = 0,06 \text{ } \Omega/\text{km}$

$D_{12} = 4 \text{ m} = D_{13} = D_{23}$



⊗ ZA VOD SA SLIKE
ODREDITI:

a) impedansa

b) admittansa

c) konstanta prost.

d) karakteristična
impedansa

$L_1 = 2 \cdot 10^{-4} \ln \frac{D_m}{r_m}$

$D_m = \sqrt[3]{D_{12} D_{13} D_{23}} = \sqrt[3]{4 \cdot 4 \cdot 4} = 4 \text{ m}$

$Z_1 = 2 \cdot 10^{-9} \ln \frac{4}{9 \cdot 10^{-3}} = 12,19 \cdot 10^{-9} \text{ H/km}$

$L = L_1 \cdot l_v = 12,19 \cdot 10^{-9} \cdot 50 = 0,0609 \text{ H}$

$Z_1 = R_1 + j\omega L_1 = 0,06 + j \cdot 314 \cdot 12,19 \cdot 10^{-9}$

$Z_1 = 0,06 + j \cdot 0,382 \text{ } \Omega/\text{km}$

$Z = Z_1 \cdot l_v = 50(0,06 + j \cdot 0,382) = 3 + j \cdot 19,138 \text{ } \Omega$

$C_1 = \frac{55,5 \cdot 10^{-9}}{\ln \frac{D_m}{a_m}} = \frac{55,5 \cdot 10^{-9}}{\ln \frac{4}{10,8 \cdot 10^{-3}}} = 9,38 \cdot 10^{-9} \text{ F/km}$

$C = l_v \cdot C_1 = 50 \cdot 9,38 \cdot 10^{-9} = 469,18 \cdot 10^{-9} \text{ F}$

$Y_1 = j\omega C_1 = j \cdot 314 \cdot 9,38 \cdot 10^{-9} = j \cdot 2,945 \cdot 10^{-6} \text{ S/km}$

$Y = l_v Y_1 = 50 \cdot j \cdot 2,945 \cdot 10^{-6} = j \cdot 147,266 \cdot 10^{-6} \text{ S}$

c) $Y_c = \sqrt{Z_1 Y_1} = \sqrt{0,3867 \angle 81^\circ \cdot 2,945 \cdot 10^{-6} \angle 90^\circ} = 1,067 \cdot 10^{-3} \angle 85,5^\circ$
[1/km]

d) $Z_c = \sqrt{\frac{Z_1}{Y_1}} = \sqrt{\frac{0,06 + j0,382}{j \cdot 2,945 \cdot 10^{-6}}} = \sqrt{\frac{0,3867 \angle 81^\circ}{2,945 \cdot 10^{-6} \angle 90^\circ}} = 362 \angle -4,5^\circ$
(Ω)