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EUROPEAN UNION
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THEORY OF TRANSMISSION AND DISTRIBUTION OF ELECTRIC ENERGY (KEE/TPDE)

Tasks for practice

to 3rd, 5th and 6th lectures

2

Determination of the two-winding transformer passive parameters (see Example 3-1)

Task:

- Create an equivalent circuit of the transformer in the form of T-cell type two-port and determine the specific values of the passive parameters, i.e. series impedance of the primary and secondary windings and shunt admittance:
  - a) in the named units, i.e. in [Ω] and the [S]
  - b) in relative units [r.u.]
- Values on the label of solved transformer are:

S_n= 4 MVA	$p=U_1/U_2$=22/6,3 kV
ΔP_0=13,5 kW	ΔP_k=49 kW
u_k=6 %	i_0=3 %

3

Determination of the voltage and currect conditions on line (see Example 5-2)

Task:

- Calculate volatage and current at the beginning of transmisson line and draw phase diagram (for check your results), if you know conditions at the end of line.

Transmission line 400 kV:
R = 0,027 Ω/km, X = 0,30 Ω/km, B = 3,71 . 10^{-6} S/km
l = 200 km, P_2 = 350 MW, cos φ = 0,98

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Solution of the simple LV network by the method of gradual simplification (see Example 6-9) (1)

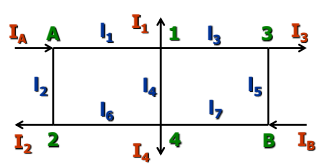
Task:

- The DC network according to the Fig. (see next page) is supplied at points A, B with voltage U_A = 220 V and U_B = 221 V. Determine I_A, I_B and current distribution in branches if the cross-section of aluminum (ρ = 0,0359 μΩm) conductors is S = 10 mm^2.
- Next, identify the points of greatest voltage drop and check that the voltage drop at these points does not exceed the permitted voltage drop of 5%.

5

Solution of the simple LV network by the method of gradual simplification (see Example 6-9) (2)

- **Fig.:**



- Current values in [A] and length values in [m]:

I_1	I_2	I_3	I_4	l_1	l_2	l_3	l_4	l_5	l_6	l_7
12	10	12	15	10	20	25	15	35	40	30

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