Aalto-yliopisto
Teknillinen korkeakoulu

Exercise Session 2

Power systems

Question 1

- A 220-kV overhead line has the following properties:
  - s=200 km
  - r=0.07 Ω/km
  - x=0.32 Ω/km
  - b=3.6 μS/km

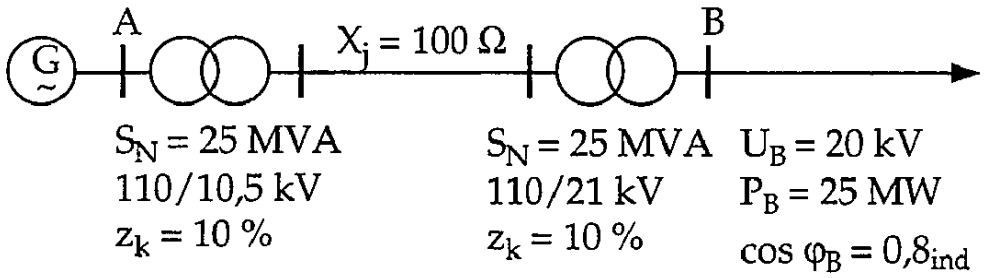
Define the parameters for medium-length line with the

a) Π-model

b) T-model

and calculate the open circuit voltage at the end of the line if the voltage at the beginning is 220 kV.

Question 2



- Calculate per-unit values for all the parameters in the picture above. Use base values: S_b=50 MVA and U_b=110 kV

Question 3

- Based on the results obtained from Question 2, calculate the voltage in busbar A (per-unit value and in volts).

Question 4

A 50-Hz, 50-MVA transformer with a 132-kV primary and a 33-kV secondary has a reactance of 0.1pu per phase. What is the reactance in ohms per phase:

(a) referred to the primary;

(b) referred to the secondary.