

ELECTRICAL CIRCUIT THEORY

KRANEVO 18.5.2012. – 23.5.2012.

Task III_2

Two lossless transmission lines of the same characteristic $(Z_c = 96\sqrt{3} \Omega, \beta)$ are used for the power supply of two consumers with the impedance $Z_{p1} = R - jX$ and $Z_{p2} = R + jX$, Figure III_2. An independent sinusoidal voltage generator ems $e_g(t) = \sqrt{2}E_g \sin \omega t$ [V] and internal impedance Z_g is connected to the input port (3,3'). The current across generator is familiar: $i_g(t) = \sqrt{1.5} \sin \omega t$ [A].

Also is familiar:

- Active power: $P_{p1} = P_{p2} = P_p = 51$ [W],
- Reactive power; $|Q_{p1}| = Q_{p2} = Q_p = 34$ [VAr].

Determine:

Values (R, X) and reactive power for transmission line $(3,3') - (1,1')$.

Remark: In the case you determine two solutions, consider solution with higher resistance of R .

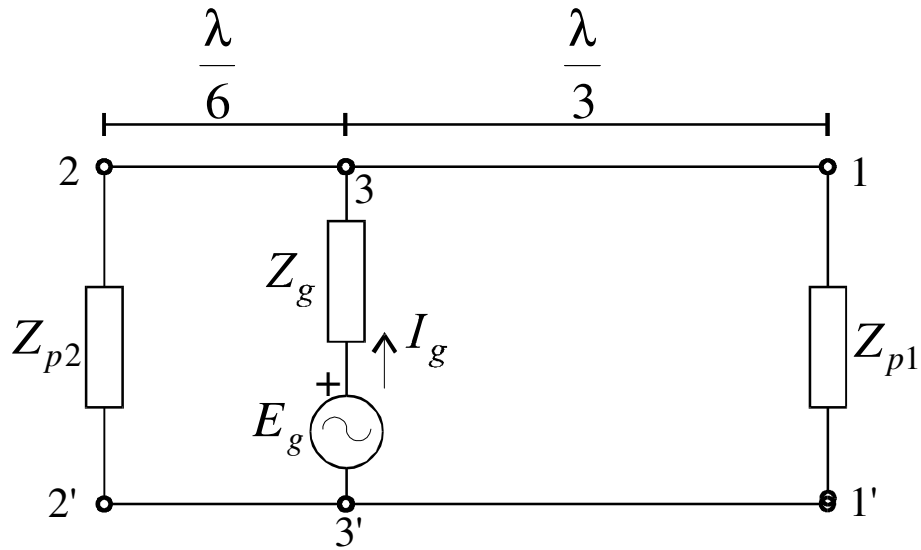


Fig. III_2