Formule iz Osnova Elektrotehnike
koje se mogu koristiti na međuispitima i završnom ispitu – III dio

Frekvencijske karakteristike:

$$Z(\omega) = \sqrt{R^2 + (\omega L - \frac{1}{\omega C})^2}$$

$$\varphi(\omega) = \arctan \frac{\omega L - \frac{1}{\omega C}}{R}$$

$$Q = \frac{\omega_0 L}{R} = \frac{1}{\omega_0 RC}$$

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$$Y(\omega) = \sqrt{(\frac{1}{R})^2 + (\omega C - \frac{1}{\omega L})^2}$$

$$\varphi(\omega) = \arctan \frac{\omega C - \frac{1}{\omega L}}{R}$$

$$Q = \frac{R}{\omega_0 L} = \omega_0 RC$$

$$\omega_0 = \frac{1}{\sqrt{LC}}$$

Snaga:

$$S = UI$$

$$P = UI\cos(\varphi)$$

$$Q = UI\sin(\varphi)$$

$$S^2 = P^2 + Q^2$$

$$S = |\dot{U}\dot{I}^*|$$

$$P = \mathfrak{Re}\{\dot{U}\dot{I}^*\}$$

$$Q = \mathfrak{Im}\{\dot{U}\dot{I}^*\}$$

$$P_R = I_R^2 R = \frac{U_R^2}{R}$$

$$Q_X = I_X^2 X = \frac{U_X^2}{X}$$

$$S_Z = I_Z^2 Z = \frac{U_Z^2}{Z}$$

$$P_{uk} = \sum P_R$$

$$Q_{uk} = \sum Q_L - \sum Q_C$$

$$S_{uk} = \sqrt{P_{uk}^2 + Q_{uk}^2}$$

$$\underline{Z_t} = \underline{Z_i}^* = R_i + jX_i$$

Teoremi:

$$\dot{U}_{12} = \frac{\sum_{i=1}^{n} (\dot{E}_i \underline{Y_i} + \dot{I}_i)}{\sum_{i=1}^{n} \underline{Y_i}}$$

$$\dot{E}_T = \underline{Z_T}\dot{I}_N$$

$$\underline{Z_T} = \underline{Z_N}$$

Trofazni sustav:

spoj u zvijezdu:

$$U_l = \sqrt{3}U_f$$

$$I_l = I_f$$

spoj u trokut:

$$I_l = \sqrt{3}I_f$$

$$U_l = U_f$$

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$$P_{uk} = 3P_f = 3U_f I_f \cos(\varphi) = \sqrt{3}U_l I_l \cos(\varphi)$$

$$\dot{U}_{0'0} = \frac{\dot{U}_{R0}\underline{Y_R} + \dot{U}_{S0}\underline{Y_S} + \dot{U}_{T0}\underline{Y_T}}{\underline{Y_R} + \underline{Y_S} + \underline{Y_T}}$$