

Formule iz Osnova Elektrotehnike (II dio)
koje se mogu koristiti na međuispitima (jesen 2009)

$$I_{ef} = \frac{I_m}{\sqrt{2}} \quad U_{ef} = \frac{U_m}{\sqrt{2}}$$

$$f = \frac{1}{T} \quad \omega = 2\pi f$$

$$\underline{a} = b + jc = Ae^{j\alpha} = A\angle\alpha$$

$$b = \Re\{\underline{a}\} = A \cos \alpha$$

$$c = \Im\{\underline{a}\} = A \sin \alpha$$

$$A = \sqrt{b^2 + c^2}$$

$$u(t) = U_m \sin(\omega t + \alpha)$$

$$\underline{u} = U_m e^{j(\omega t + \alpha)}$$

$$\underline{U}_m = U_m e^{j\alpha}$$

$$\underline{U} = U e^{j\alpha} = \dot{U}$$

$$u(t) = \Im\{\underline{u}\}$$

$$X_L = \omega L \quad B_L = \frac{1}{\omega L}$$

$$X_C = \frac{1}{\omega C} \quad B_C = \omega C$$

$$\underline{Z} = R \pm jX$$

$$\varphi = \arctan\left(\frac{X}{R}\right)$$

$$\underline{Y} = G \mp jB$$

$$\psi = \arctan\left(\frac{B}{G}\right)$$

$$\varphi = -\psi$$

Frekvencijske karakteristike:

$$\Im\{\underline{Z}\} = 0 \quad \Im\{\underline{Y}\} = 0$$

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

serija *RLC*:

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

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

$$\rho = \sqrt{\frac{L}{C}}$$

paralela *RLC*:

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

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

$$\gamma = \frac{1}{\rho} = \sqrt{\frac{C}{L}}$$

paralela *RL* i *RC*:

$$\omega_0 = \frac{1}{\sqrt{LC}} \sqrt{\frac{R_L^2 - \frac{L}{C}}{R_C^2 - \frac{L}{C}}}$$

Snaga:

$$S = UI$$

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

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

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

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

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

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

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

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

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

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

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

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

Prilagođenje:

$$\underline{Z}_t = \underline{Z}_i^* = R_i + jX_i$$

$$R_t = |Z_i| = |R_i + jX_i|$$