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

Snaga:

$$S = UI$$

$$P = UI\cos(\varphi) \quad Q = UI\sin(\varphi)$$

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

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

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

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

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

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

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

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

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

Prilagođenje:

$$\underline{Z_t} = \underline{Z_i}^*$$

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

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:

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

$$U_l = U_f$$

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

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

Efektivne i srednje vrijednosti:

$$Y_{ef} = \sqrt{\frac{1}{T}\int_0^T y(t)^2 dt}$$

$$Y_{sr} = \frac{1}{T}\int_0^T y(t) dt$$

$$\xi = \frac{Y_{ef}}{Y_{sr}} \qquad \sigma = \frac{Y_m}{Y_{ef}}$$

$$Y_{ef} = \sqrt{Y_0^2 + Y_{1ef}^2 + Y_{2ef}^2 + \dots}$$

$$Y_{sr} = Y_{sr0}\frac{T_i}{T}$$

$$Y_{ef} = Y_{ef0}\sqrt{\frac{T_i}{T}}$$

Nesinusoidne pobude u el. krugu:

$$P = P_0 + P_1 + P_2 + \ldots + P_{\mathbf{n}}$$

$$I_{ef} = \sqrt{I_0^2 + I_{1ef}^2 + I_{2ef}^2 + \ldots + I_{\mathbf{n}ef}^2}$$

$$U_{ef} = \sqrt{U_0^2 + U_{1ef}^2 + U_{2ef}^2 + \ldots + U_{\mathbf{n}ef}^2}$$

Prijelazne pojave–kondenzator:

$$\tau = RC$$

$$u_C(t) = U(1 - e^{-\frac{t}{\tau}})$$

$$i(t) = \frac{U}{R} e^{-\frac{t}{\tau}}$$

Prijelazne pojave–induktivitet:

$$\tau = \frac{L}{R}$$

$$u_L(t) = U e^{-\frac{t}{\tau}}$$

$$i(t) = \frac{U}{R}(1 - e^{-\frac{t}{\tau}})$$