



ΠΡΟΤΕΙΝΟΜΕΝΕΣ
ΑΠΑΝΤΗΣΕΙΣ ΘΕΜΑΤΩΝ

ΘΕΜΑ Α

A1. α. Σ, β. Σ, γ. Λ, δ. Λ, ε. Λ

A2. 1. ε., 2. γ., 3. α., 4. στ., 5. δ.

ΘΕΜΑ Β

B1. Σχ. Βιβλίο σελ. 401 (Ατομική, Ομαδική και Κεντρική αντιστάθμιση)

B2. α) Σχ. Βιβλίο σελ. 458 (σχήμα)

$$\beta) U_{\mu\epsilon\sigma} = 0,45 * U = 0,45 * 100 = 45V$$

$$U_{\epsilon\nu} = 0,5 * U = 0,5 * 100 = 50V$$

B3. $\omega = 2\pi f = 2\pi * 50 = 100\pi \text{ rad/s}$

$$\phi = \omega t + \phi_0 = 100\pi * 0,01 + \pi/2 = \pi + \pi/2 = (3\pi/2) \text{ rad}$$

ΘΕΜΑ Γ

$$\mathbf{\Gamma 1.} \quad I_{\gamma\rho} = \sqrt{3} * I_{\tau\rho\iota\gamma} \rightarrow 20\sqrt{3} = \sqrt{3} * I_{\tau\rho\iota\gamma} \rightarrow I_{\tau\rho\iota\gamma} = 20A$$

$$\mathbf{\Gamma 2.} \quad R = \frac{R_1 * R_2}{R_1 + R_2} = \frac{30 * 60}{30 + 60} = \frac{1800}{90} = 20\Omega$$



Γ3.

$$I_{\text{τριγ}} = \frac{U_{\Phi}}{R} \rightarrow 20 = \frac{U_{\Phi}}{20} \rightarrow U_{\Phi} = 20 * 20 = 400V$$

$$U_{\text{Π}} = U_{\Phi} \rightarrow U_{\text{Π}} = 400V$$

Γ4.

$$P_{\Phi} = I_{\text{τριγ}}^2 * R = 20^2 * 20 = 400 * 20 = 8000W$$

$$P_{\text{ΟΛ}} = 3 * P_{\Phi} = 3 * 8000 = 24000W$$

ΘΕΜΑ Δ

Δ1.

$$Z^2 = X_L^2 + R^2 \rightarrow 25^2 = X_L^2 + 15^2 \rightarrow 625 = X_L^2 + 225$$

$$\rightarrow X_L^2 = 625 - 225 = 400 \rightarrow X_L = \sqrt{400} = 20\Omega$$

Δ2.

$$I_o = \frac{U_{R_o}}{R} = \frac{60\sqrt{2}}{15} = 4\sqrt{2}A$$

$$I_{\varepsilon v} = \frac{I_o}{\sqrt{2}} = \frac{4\sqrt{2}}{\sqrt{2}} = 4A$$

$$I_{\varepsilon v} = \frac{U_{\varepsilon v}}{Z} \rightarrow 4 = \frac{U_{\varepsilon v}}{25} \rightarrow U_{\varepsilon v} = 4 * 25 = 100V$$

Δ3.

$$\sigma v \nu \varphi = \frac{R}{Z} = \frac{15}{25} = 0,6$$

$$P = U_{\varepsilon v} I_{\varepsilon v} \sigma v \nu \varphi = 100 * 4 * 0,6 = 240W$$

$$\eta \mu \varphi = \frac{X_L}{Z} = \frac{20}{25} = 0,8$$

$$Q = U_{\varepsilon v} I_{\varepsilon v} \eta \mu \varphi = 100 * 4 * 0,8 = 320VAr$$

Δ4.

$$P = S' * \sigma v \nu \varphi' \rightarrow 240 = S' * 0,8 \rightarrow S' = \frac{240}{0,8} = \frac{2400}{8} = 300VA$$

$$Q' = S' * \eta \mu \varphi' = 300 * 0,6 = 180VAr$$



Δ5.

$$Q_c = Q - Q' = 320 - 180 = 140 \text{Var}$$

$$C = \frac{Q_c}{\omega \cdot U_{\epsilon v}^2} = \frac{140}{280 \cdot 100^2} = \frac{140}{280 \cdot 10000} = \frac{1}{2 \cdot 10000} = \frac{1}{2 \cdot 10^4} = \frac{5}{10 \cdot 10^4} = \frac{5}{10^5} = 5 \cdot 10^{-5} \text{F}$$