

ΘΕΜΑ Α.

A1 α. Σ β. Λ γ. Σ δ. Λ ε. Σ

A2. 1. στ 2. δ 3. α 4. ε 5. β

ΘΕΜΑ Β

B1. Η νέα συχνότητα θα υποδιπλασιαστεί

$$T = \frac{1}{f} \quad \text{Διπλάσια περίοδος} \quad \frac{T}{2T} = \frac{\frac{1}{f}}{\frac{1}{f'}} \Leftrightarrow \frac{1}{2} = \frac{f'}{f} \Leftrightarrow$$
$$2T = \frac{1}{f'}$$

$$\boxed{f' = \frac{f}{2}}$$

B2 α) περί 336 ορίστος.  
β) περί 340 ορίστος.

B3.  $U_0 = U_{\text{eff}} \cdot \sqrt{2} = 230\sqrt{2}$   
 $\omega = 2\pi f = 2\pi \cdot 50 = 100\pi$   
 $u = 230\sqrt{2} \sin(100\pi t + 30^\circ) \text{ V}$

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ΘΕΜΑ Γ

$$\Gamma_1. I_R = \frac{U}{R} = \frac{240}{3} = 80 \text{ A}$$

$$I_R = 80 \text{ A}$$

$$\Gamma_2. I_{0\lambda} = \sqrt{I_R^2 + I_C^2} \Leftrightarrow I_C = \sqrt{I_{0\lambda}^2 - I_R^2} = \sqrt{100^2 - 80^2} =$$

$$= \sqrt{10.000 - 6400} = \sqrt{3600} = 60$$

$$I_C = 60 \text{ A}$$

$$\Gamma_3. X_C = \frac{U}{I_C} = \frac{240}{60} = 4 \Omega$$

$$X_C = 4 \Omega$$

$$\Gamma_4. Z = \frac{U}{I_{0\lambda}} = \frac{240}{100} = 2,4 \Omega$$

$$Z = 2,4 \Omega$$

$$\Gamma_5. S = U \cdot I = 240 \cdot I = 240 \cdot 100 = 24000 \text{ VA} = 24 \text{ kVA}$$

$$S = 24 \text{ kVA}$$

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$$\Delta_1. Z = \sqrt{R^2 + X_L^2} = \sqrt{3^2 + 4^2} = \sqrt{9 + 16} = \sqrt{25} = 5 \Omega$$

$$\boxed{Z = 5 \Omega}$$

$$\Delta_2. I_{\gamma p} = \sqrt{3} I_{\phi} \Leftrightarrow I_{\phi} = \frac{I_{\gamma p}}{\sqrt{3}} = \frac{50\sqrt{3}}{\sqrt{3}} = 50 \text{ A.}$$

$$\boxed{I_{\phi} = 50 \text{ A.}}$$

$$\Delta_3. I_{\phi} = \frac{U_{\phi}}{Z} \Leftrightarrow U_{\phi} = Z \cdot I_{\phi} = 50 \cdot 5 = 250 \text{ V.}$$

$$\text{Για } \delta \mu \quad U_{\eta} = U_{\phi}$$

$$\boxed{U_{\eta} = 250 \text{ V}}$$

$$\Delta_4. P = \sqrt{3} U_{\eta} I_{\gamma p} \cdot \cos \varphi.$$

$$\cos \varphi = \frac{R}{Z} = \frac{3}{5} = 0,6.$$

$$P = \sqrt{3} \cdot 250 \cdot 50\sqrt{3} \cdot 0,6 = 3 \cdot 250 \cdot 50 \cdot 0,6 = 22.500 \text{ W}$$

$$\boxed{P = 22.500 \text{ W}}$$

ΜΑΥΡΟΝΤΗΣ ΝΙΒΟΛΑΟΣ 1782