

ΘΕΜΑ Α:

- A1 → δ
- A2 → α
- A3 → γ
- A4 → δ
- A5 → α

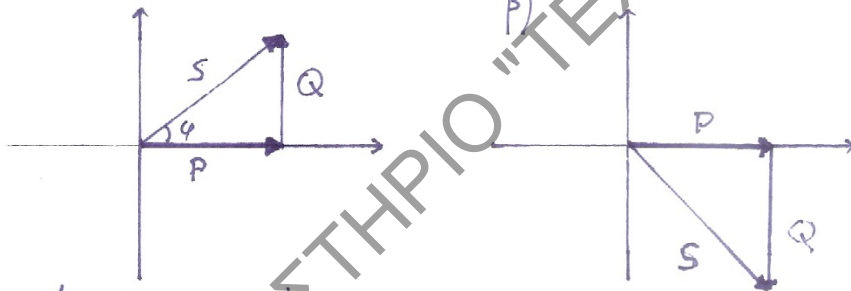
ΘΕΜΑ Β:

B1.

- 1 → δ
- 2 → α
- 3 → β
- 4 → ε

B2.

a)



(για  $V_L > V_C$  επαγωγική συμπεριφορά)

(για  $V_L < V_C$  χωρητική συμπεριφορά)

B3.

Γεωμετρική μορφή επαγωγόμενου Ρεύματος  $\leadsto i = I_{max} \cdot \sin(\omega t + \varphi)$  (\*)

$\omega = 2\pi f \Rightarrow \omega = 2 \cdot 3,14 \cdot 50 \Rightarrow \boxed{\omega = 314 \text{ rad/sec}}$

$(\omega t + \varphi) = (314 \cdot 0,01 + \frac{\pi}{4}) = 3,14 + \frac{\pi}{4} = \pi + \frac{\pi}{4} \Rightarrow$

$\Rightarrow \varphi = \frac{5\pi}{4} \quad \eta \quad \varphi = 225^\circ$

ΘΕΜΑ Γ:

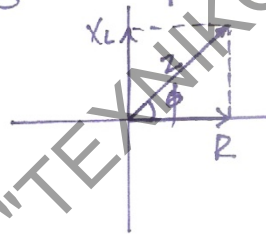
Γ1.  $V_R = I \cdot R \Rightarrow V_R = 2 \cdot 3 \Rightarrow V_R = 6V$

Γ2.  $R_{\sigma} = R + R_0 \Rightarrow R_{\sigma} = 3 + 1 \Rightarrow R_{\sigma} = 4\Omega$

Γ3.  $Z = \sqrt{R_{\sigma}^2 + X_L^2} \Rightarrow Z = \sqrt{4^2 + 3^2} \Rightarrow Z = \sqrt{25} \Rightarrow$   
 $\Rightarrow Z = 5\Omega$

Γ4.

$\cos\varphi = \frac{R_{\sigma}}{Z} \Rightarrow \cos\varphi = \frac{4}{5} \Rightarrow \cos\varphi = 0,8$



Γ5.

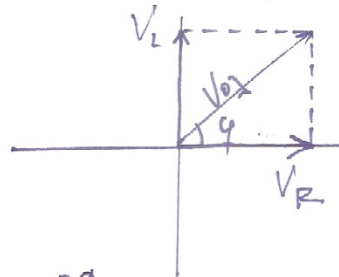
$V_L = I \cdot (X_L + R_0) \Rightarrow V_L = 2 \cdot 4 \Rightarrow V_L = 8V$

$V_{\sigma} = \sqrt{V_R^2 + V_L^2}$

$V_{\sigma} = \sqrt{6^2 + 8^2}$

$V_{\sigma} = \sqrt{100}$

$V_{\sigma} = 10V$



$P = V_{\sigma} \cdot I_{\sigma} \cdot \cos\varphi$  (W)

$P = 10 \cdot 2 \cdot 0,8 \Rightarrow P = 16W$

ΘΕΜΑ 4:

$$\Delta 1. \quad V_{q_{\Delta}} = V_{\eta_{\Delta}} = 660V$$

$$\Delta 2. \quad I_{q_{\Delta}} = \frac{V_{q_{\Delta}}}{R} = \frac{660}{3\phi} \Rightarrow I_{q_{\Delta}} = 22A$$

$$\Delta 3. \quad I_{\phi_{\Delta}} = I_{\eta_{\Delta}} = \sqrt{3} I_{q_{\Delta}} = 1,73 \cdot 22 \Rightarrow I_{\phi_{\Delta}} \approx 38A$$

$\eta (I_{\phi_{\Delta}} = \sqrt{3} \cdot 22 A)$

$$\Delta 4. \quad P_{\Sigma} = \sqrt{3} U_{\eta_{\Delta}} \cdot I_{\eta_{\Delta}} \cdot \cos \varphi = \sqrt{3} \cdot 660 \cdot \sqrt{3} \cdot 22 \Rightarrow$$
$$\Rightarrow P_{\Sigma} = 43,560W \quad \eta (43,56KW)$$

$$\Delta 5. \quad P_{\Sigma} = P_{L_1} + P_{L_3} \quad \textcircled{1}$$

$$P_{L_1} = I_{q_{L_1}} \cdot U_{q_{L_1}} = 22 \cdot 660 \Rightarrow P_{L_1} = 14,520W$$

$$P_{L_3} = I_{q_{L_3}} \cdot U_{q_{L_3}} = 22 \cdot 600 \Rightarrow P_{L_3} = 14,520W$$

$$\textcircled{1} \Rightarrow P_{\Sigma} = 14,520 + 14,520 \Rightarrow$$

$$\Rightarrow P_{\Sigma} = 29,040W \quad \eta \quad P_{\Sigma} \approx 29KW$$