

ΗΛΕΚΤΡΟΛΟΓΙΑ

ΟΜΑΔΑ Α

A1. β

A2. δ

A3. γ

A4. β

A5. α

A6. α. Λ

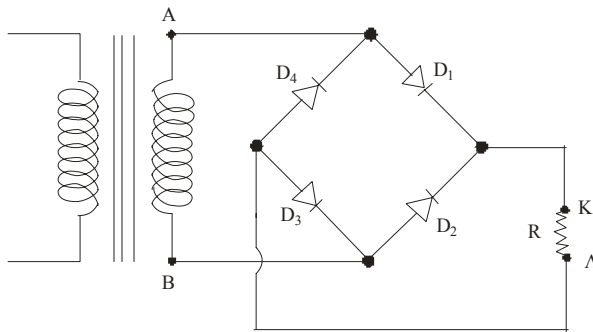
β. Σ

γ. Λ

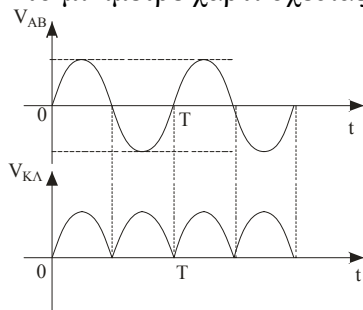
δ. Λ

ε. Σ

A7.



Στο μιλιμετρέ χαρτί σχεδιάζουμε

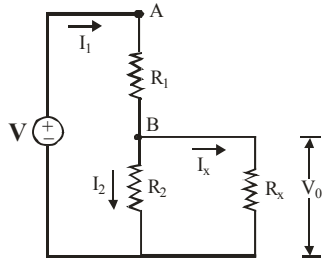


A8. Με τη βοήθεια των θεωρημάτων της άλγεβρας Boole έχουμε:

$$\overline{(\overline{x} \cdot \overline{y})} + (x + \overline{y}) \cdot y = \overline{(\overline{x + y})} + xy + \overline{y} \cdot y = x + y + xy + 0 = (x + xy) + y = x + y$$

ΟΜΑΔΑ Β

B1.



$$V = I_1 \cdot R_{\text{ολ}} \quad \left. \begin{array}{l} \text{Διαιρείτε κατά} \\ \text{μέλη} \end{array} \right\} \Rightarrow \frac{V}{V_0} = \frac{R_{\text{ολ}}}{R_{2,x}} \Rightarrow \frac{100}{50} = \frac{R_{\text{ολ}}}{R_{2,x}} \Rightarrow R_{\text{ολ}} = 2R_{2,x} \Rightarrow$$

$$R_1 + R_{2,x} = 2R_{2,x} \Rightarrow R = R_{2,x} = \frac{R_2 \cdot R_x}{R_2 + R_x} \quad \begin{array}{l} \text{αντικατάσταση} \\ \text{στο S.I.} \end{array} \Rightarrow \boxed{R_x = 30 \Omega}$$

B2.

$$\alpha. A_V = \frac{V_{0 \text{ εξ}}}{V_{0 \text{ εισ}}} \Rightarrow V_{0 \text{ εισ}} = \frac{V_{0 \text{ εξ}}}{A_V} \Rightarrow V_{0 \text{ εισ}} = \frac{1}{6} \text{ V}$$

$$\beta. A_P = A_I \cdot A_V \Rightarrow A_P = 300 \text{ dB}$$

B3.

Από τη δεδομένη εξίσωση $v = 80\eta\mu 200t$ βρίσκουμε ότι:

$$V_0 = 80 \text{ Volt} \quad \text{και} \quad \omega = 200 \text{ rad/s}$$

$$\alpha. X_L = L \cdot \omega \Rightarrow L = \frac{X_L}{\omega} \Rightarrow \boxed{L = 0,04 \text{ H}}$$

$$\beta. X_{\Pi} = \sqrt{R_{\Pi}^2 + X_L^2} \Rightarrow \boxed{X_{\Pi} = 10 \Omega}$$

$$\gamma. Z = \sqrt{(R_1 + R_{\Pi})^2 + X_L^2} \Rightarrow \boxed{Z = 8\sqrt{2} \Omega}$$

$$\delta. I_0 = \frac{V_0}{Z} \Rightarrow \boxed{I_0 = 5\sqrt{2} \text{ A}}$$

$$\epsilon. \sigma_{\text{υν}\phi} = \frac{R_{\text{ολ}}}{Z} = \frac{R_1 + R_{\Pi}}{Z} \Rightarrow \boxed{\sigma_{\text{υν}\phi} = \frac{\sqrt{2}}{2}}$$

$$\sigma\tau. \text{ ΠΡΑΓΜΑΤΙΚΗ ΙΣΧΥΣ: } P_{\mu} = V_{\text{ε}\nu} \cdot I_{\text{ε}\nu} \cdot \sigma_{\text{υν}\phi} = \frac{V_0}{\sqrt{2}} \cdot \frac{I_0}{\sqrt{2}} \cdot \sigma_{\text{υν}\phi} \Rightarrow \boxed{P_{\mu} = 200 \text{ W}}$$

$$\text{ ΑΕΡΓΗ ΙΣΧΥΣ: } Q = V_{\text{ε}\nu} \cdot I_{\text{ε}\nu} \cdot \eta\mu\phi = \frac{V_0}{\sqrt{2}} \cdot \frac{I_0}{\sqrt{2}} \cdot \eta\mu\phi \Rightarrow \boxed{Q = 200 \text{ VAR}}$$

$$\text{ ΦΑΙΝΟΜΕΝΗ ΙΣΧΥΣ: } S = V_{\text{ε}\nu} \cdot I_{\text{ε}\nu} = \frac{V_0}{\sqrt{2}} \cdot \frac{I_0}{\sqrt{2}} \Rightarrow \boxed{S = 200\sqrt{2} \text{ VA}}$$