

ΑΣΚΗΣΗ 4 (Σελ. 73)

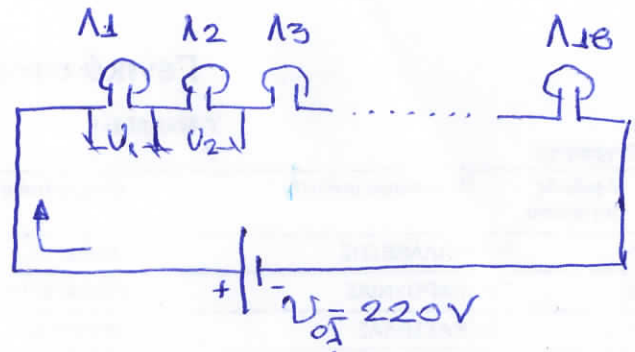
18 όμοια λαμπάκια (σε σειρά)

$$V_{ολ} = 220V$$

α) $V_{κάθε\ λαμπάκι} = ;$

β) $R_{κάθε\ λαμπάκι} = ;$

$$I = 0,3A$$



α) $V_{ολ} = 18$

$$\left. \begin{array}{l} V_1 + V_2 + V_3 + \dots + V_{18} = V_{ολ} \\ V_1 = V_2 = V_3 = \dots = V_{18} = V \end{array} \right\} \text{ Άρα } \frac{U + U + U + \dots + U}{18 \text{ λαμπάκια}} = V_{ολ}$$

$$18V = V_{ολ} \Rightarrow$$

$$V_{ολ} = 18V \Rightarrow V = \frac{V_{ολ}}{18} = \frac{220V}{18} \Rightarrow$$

$$\boxed{V = 12,2V}$$

β) Ξέρουμε ότι η τάση σε κάθε λαμπτήρα είναι $V = 12,2V$. Εφαρμόζουμε νόμο του ΟΗΜ

$$I = \frac{U_{λαμπ}}{R_{λαμπ}} \Rightarrow R_{λαμπ} = \frac{U_{λαμπ}}{I} = \frac{12,2V}{0,3A} \Rightarrow$$

$$\boxed{R_{λαμπ} = 40,7\Omega}$$

ΑΣΚΗΣΗ 5 (Σελ. 43)

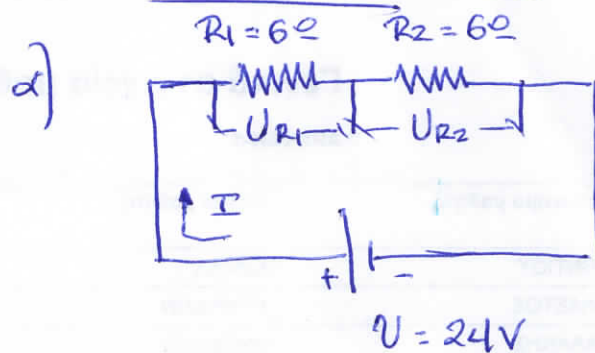
$$R_1 = R_2 = 6\Omega$$

$$U = 24V$$

A) Σωσ. Σε Σειρά.

B) Σωσ. Παράλ.

A) Σωσ. Σε Σειρά



$$R_{ολ} = R_1 + R_2 = 6\Omega + 6\Omega \Rightarrow$$

$$R_{ολ} = 12\Omega$$

$$\beta) I = \frac{U}{R} = \frac{24V}{12\Omega} \Rightarrow I = 2A$$

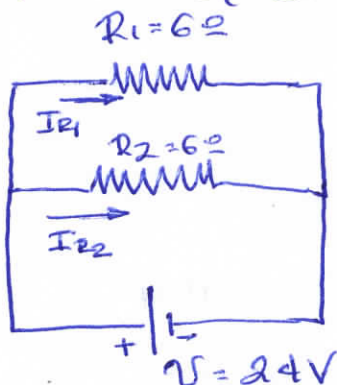
$$\gamma) U_{R1} = I_1 \cdot R_1 \Rightarrow U_{R1} = 2A \cdot 6\Omega \Rightarrow$$
$$U_{R2} = I_2 \cdot R_2 \Rightarrow U_{R2} = 2A \cdot 6\Omega \Rightarrow$$

$$I_1 = I_2 = I = 2A$$

$$\Rightarrow U_{R1} = 12V$$
$$\Rightarrow U_{R2} = 12V$$

$$\delta) I_{R1} = I_{R2} = I = 2A$$

B) Σωσ. Παράλληλα



$$\alpha) \frac{1}{R_{ολ}} = \frac{1}{R_1} + \frac{1}{R_2} \Rightarrow \frac{1}{R_{ολ}} = \frac{1}{6} + \frac{1}{6} \Rightarrow$$

$$\frac{1}{R_{ολ}} = \frac{1}{6} + \frac{1}{6} \Rightarrow \frac{1}{R_{ολ}} = \frac{2}{6} \Rightarrow$$

$$\frac{R_{ολ}}{1} = \frac{6}{2} \Rightarrow R_{ολ} = 3\Omega$$

$$b) I_{01} = \frac{V_{01}}{R_{01}} = \frac{24V}{3\Omega} \Rightarrow \boxed{I_{01} = 8A}$$

δ) Παράδοση συνδεσμολογία

$$\boxed{V_{01} = V_{R1} = V_{R2} = 24V}$$

$$δ) I_{R1} = \frac{V_{R1}}{R_1} = \frac{24V}{6\Omega} \Rightarrow \boxed{I_{R1} = 4A}$$

$$I_{R2} = \frac{V_{R2}}{R_2} = \frac{24V}{6\Omega} \Rightarrow \boxed{I_{R2} = 4A}$$

$$I_{01} = I_{R1} + I_{R2} \Rightarrow I_{01} = 4A + 4A \Rightarrow$$

$$I_{01} = 8A \quad (\text{Αρα λoxyα})$$

ΑΣΚΗΣΗ 6 (2x2 4A)

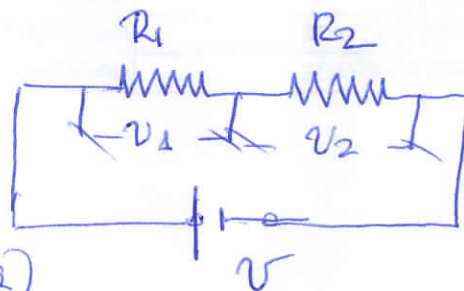
$$R_1 = 5\Omega \quad (\text{Συν. Σε σειρά})$$

$$R_2 = 50\Omega$$

$$V = 220V$$

$$V_1 = ?$$

$$V_2 = ?$$



(1ος ΤΡΟΠΟΣ)

$$\left. \begin{array}{l} V_1 = I \cdot R_1 \\ V_2 = I \cdot R_2 \end{array} \right\} \frac{V_1}{V_2} = \frac{I \cdot R_1}{I \cdot R_2} \Rightarrow$$

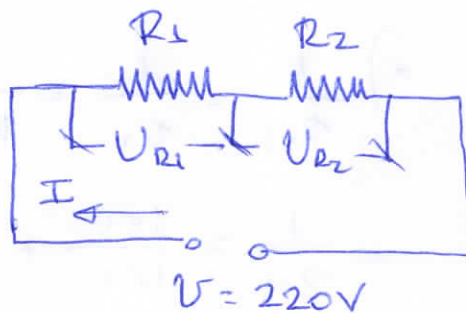
$$\boxed{V_1 + V_2 = V} \Rightarrow \frac{V_1}{V_2} = \frac{R_1}{R_2} \Rightarrow$$

$$\frac{V_1}{V_2} = \frac{5}{50} \Rightarrow \frac{V_1}{V_2} \times \frac{1}{10} \Rightarrow \boxed{V_2 = 10V_1}$$

$$\left. \begin{array}{l} U_1 + U_2 = U \\ U_2 = 10U_1 \end{array} \right\} \begin{array}{l} U_1 + 10U_1 = U \Rightarrow 11U_1 = U \Rightarrow \\ 11U_1 = 220 \Rightarrow U_1 = \frac{220}{11} \Rightarrow \boxed{U_1 = 20V} \end{array}$$

$$U_1 + U_2 = U \Rightarrow U_2 = U - U_1 = 220V - 20V \\ \Rightarrow \boxed{U_2 = 200V}$$

2^o Тренировка



$$R_{\text{ол}} = R_1 + R_2 \Rightarrow R_{\text{ол}} = 5\Omega + 50\Omega \Rightarrow \\ \boxed{R_{\text{ол}} = 55\Omega}$$

$$I_{\text{ол}} = \frac{U_{\text{ол}}}{R_{\text{ол}}} = \frac{220V}{55\Omega} \Rightarrow \boxed{I_{\text{ол}} = 4A}$$

$$U_{R1} = I_{\text{ол}} \cdot R_1 = 4A \cdot 5\Omega \Rightarrow \boxed{U_{R1} = 20V}$$

$$U_{R2} = I_{\text{ол}} \cdot R_2 = 4A \cdot 50\Omega \Rightarrow \\ \boxed{U_{R2} = 200V}$$

$$U_{R1} + U_{R2} = U \Rightarrow \\ 20 + 200 = 220V$$

АзКНШН № (201. 74)

$$\left. \begin{array}{l} R_1 = 10 \\ R_2 = 1000 \end{array} \right\} \text{Двѐ. Пѐрѐдѐдѐ}$$

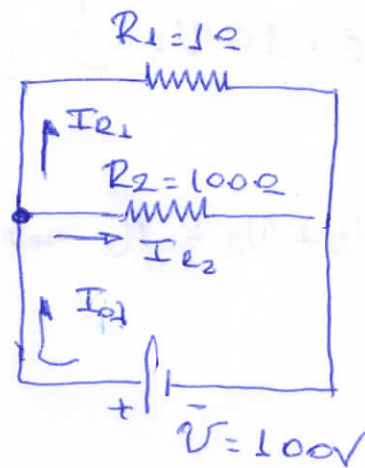
$$U = 100 \text{ V}$$

$$a) R_{01} = ;$$

$$b) I = ;$$

$$c) I_{R1} = ;$$

$$I_{R2} = ;$$



$$a) \frac{1}{R_{01}} = \frac{1}{R_1} + \frac{1}{R_2} \Rightarrow \frac{1}{R_{01}} = \frac{1}{10} + \frac{1}{1000}$$

$$\Rightarrow \frac{1}{R_{01}} = \frac{100}{1000} + \frac{1}{1000} \Rightarrow \frac{1}{R_{01}} = \frac{101}{1000}$$

$$\Rightarrow \frac{R_{01}}{1} = \frac{1000}{101} \Rightarrow \boxed{R_{01} = 9.901 \Omega}$$

$$b) I_{01} = \frac{U}{R_{01}} \Rightarrow I_{01} = \frac{100 \text{ V}}{9.901 \Omega} \Rightarrow$$

$$\boxed{I_{01} = 10.1 \text{ A}}$$

$$c) I_{R1} = \frac{U_{R1}}{R_1}$$

$$I_{R2} = \frac{U_{R2}}{R_2}$$

$$I_{01} = I_{R1} + I_{R2}$$

$$U_{R1} = U_{R2} = U$$

$$I_{R1} = \frac{U}{R_1} \Rightarrow I_{R1} = \frac{100 \text{ V}}{10} \Rightarrow$$

$$\boxed{I_{R1} = 10 \text{ A}}$$

$$I_{R2} = \frac{U}{R_2} \Rightarrow I_{R2} = \frac{100 \text{ V}}{1000}$$

$$\Rightarrow \boxed{I_{R2} = 0.1 \text{ A}}$$

$$I_{01} = I_{R1} + I_{R2} = 10 \text{ A} + 0.1 \text{ A} \Rightarrow$$

$$\boxed{I_{01} = 10.1 \text{ A}}$$