

ΕΠΑΝΑΛΗΠΤΙΚΑ ΘΕΜΑΤΑ 2012

E_3.Ηλ3Τ(α)

ΤΑΞΗ: Γ' ΓΕΝΙΚΟΥ ΛΥΚΕΙΟΥ
ΚΑΤΕΥΘΥΝΣΗ: ΤΕΧΝΟΛΟΓΙΚΗ (1ος Κύκλος)
ΜΑΘΗΜΑ: ΗΛΕΚΤΡΟΛΟΓΙΑ

Ημερομηνία: Κυριακή 22 Απριλίου 2012

ΑΠΑΝΤΗΣΕΙΣ

ΟΜΑΔΑ Α

- A.1. δ
A.2. α
A.3. γ
A.4. γ

- A.5. α. Λ
β. Λ
γ. Σ
δ. Σ
ε. Σ

A.6.

$$P_{\Sigma} = \frac{V_{\Sigma}^2}{R_{\Sigma}} \Rightarrow R_{\Sigma} = \frac{V_{\Sigma}^2}{P_{\Sigma}} = \frac{400}{100} \Rightarrow R_{\Sigma} = 4\Omega$$

$$I_{\Sigma} = \frac{V_{\Sigma}}{R_{\Sigma}} = \frac{20}{4} \Rightarrow I_{\Sigma} = 5A$$

$$I_{\Sigma} = \frac{1}{\frac{1}{R_1} + \frac{1}{\frac{1}{R_2} + \frac{1}{R_{\Sigma}}}} \cdot I = \frac{1}{\frac{1}{4} + \frac{1}{2} + \frac{1}{4}} \cdot 20 \Rightarrow I_{\Sigma} = 5A$$

Άρα λειτουργεί κανονικά.

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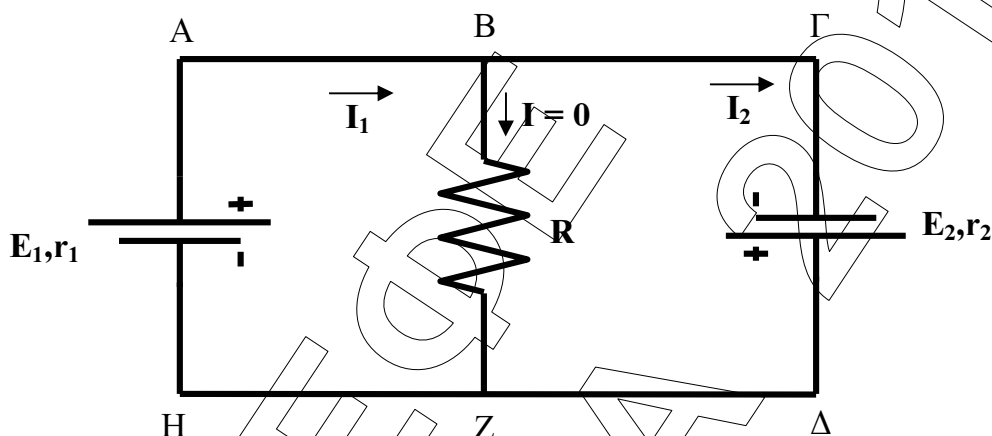
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A.7. α. 2ος Ν.Κ.(ΑΒΖΗ): $-E_1 + I_1 r_1 = 0 \Rightarrow I_1 = \frac{E_1}{r_1}$

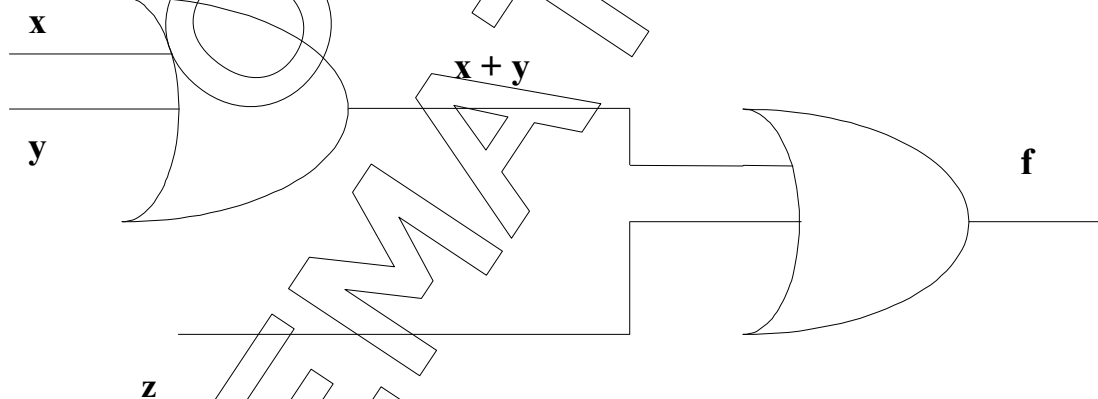
2ος Ν.Κ.(ΒΓΖΔ): $-E_2 + I_2 r_2 = 0 \Rightarrow I_2 = \frac{E_2}{r_2}$

Εφόσον $I_R = 0$ θα έχω: $I_1 = I_2$.

$$\frac{E_1}{r_1} = \frac{E_2}{r_2} \Rightarrow E_2 = E_1 \cdot \frac{r_2}{r_1} = 20 \cdot \frac{3}{1} = 60V$$



β.



x	y	z	f
0	1	0	1
1	0	0	1
1	1	0	1
0	0	0	0
0	1	1	1
1	0	1	1
1	1	1	1
0	0	1	1

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ΟΜΑΔΑ Β

B.1. α.

$$V_0 = N\omega BA = 500 \cdot 400 \cdot 0,02 \cdot 0,04 = 160V$$

$$Z = \sqrt{R^2 + (L\omega)^2} = \sqrt{40^2 + 40^2} = 40\sqrt{2}\Omega$$

$$I_0 = \frac{V_0}{Z} = \frac{160}{40\sqrt{2}} = \frac{40\sqrt{2}}{2} = 20\sqrt{2}A$$

β.

$$\varepsilon\phi\theta = \frac{X_L}{R} = \frac{\omega \cdot L}{R} = 1$$

$$I = I_0 \eta \mu \omega t \Rightarrow I = 20\sqrt{2} \eta \mu(400t - \frac{\pi}{4})$$

γ.

$$Z' = \sqrt{R^2 + (2L\omega)^2} = \sqrt{40^2 + 4 \cdot 40^2} = 40\sqrt{5} \Omega$$

δ.

$$V_0' = N \cdot 2\omega \cdot B \cdot A = 320V$$

$$I_0' = \frac{V_0'}{Z'} = \frac{320}{40\sqrt{5}} = \frac{8\sqrt{5}}{5} = 1,6\sqrt{5}A$$

$$\varepsilon\phi\theta' = \frac{X_L'}{R} = \frac{\omega' \cdot L}{R} = 2$$

$$I' = 1,6\sqrt{5} \eta \mu(800t - \theta') (S.I.)$$

$$V' = 320 \eta \mu 800t (S.I.)$$

B.2. α..

$$P_\Lambda = \frac{V_\Lambda^2}{R_\Lambda} \Rightarrow R_\Lambda = \frac{V_\Lambda^2}{P_\Lambda} = \frac{625}{125} = 5 \Omega$$

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E_3.Ηλ3Τ(α)

β.

$$E_{o\lambda} = E_1 + E_2 - E_3 + E_4 = 40 + 30 - 25 + 40 = 85V$$

$$r_{o\lambda} = \frac{r_1 + r_2 + r_3 + r_4}{3} = \frac{6}{3} = 2\Omega$$

$$I = \frac{E_{o\lambda}}{N \cdot R_{\Lambda} + r_{o\lambda}}$$

$$I = I_{\Lambda} = \frac{V_{\Lambda}}{R_{\Lambda}} = 5A$$

$$5 = \frac{85}{N \cdot 5 + 2} \Rightarrow N = 3$$

γ.

$$I_{\text{ΚΛΑΔΟΥ}} = \frac{I_{\Lambda}}{3}$$

$$V_{AB} = -V_{\Pi E_3} = -E_3 + \frac{I_{\Lambda}}{3} \cdot r_3 = -25 + \frac{5}{3} \cdot 1 = -\frac{70}{3}V$$

δ.

$$V_{\Pi E_1} = E_1 - \frac{I_{\Lambda}}{3} \cdot r_1 = 40 - \frac{5}{3} \cdot 2 = \frac{110}{3}V$$