

ΑΠΑΝΤΗΣΕΙΣ
ΠΑΝΕΛΛΑΔΙΚΩΝ ΕΞΕΤΑΣΕΩΝ 2023

ΜΑΘΗΜΑ

ΗΛΕΚΤΡΟΤΕΧΝΙΑ ΙΙ

ΩΡΑ ΑΝΑΡΤΗΣΗΣ

11:25



φροντιστήρια
ΠΟΥΚΑΜΙΣΟΣ

Ο ΜΕΓΑΛΥΤΕΡΟΣ ΦΡΟΝΤΙΣΤΗΡΙΑΚΟΣ ΟΜΙΛΟΣ ΣΤΗΝ ΕΛΛΑΔΑ

ΠΑΝΕΛΛΑΔΙΚΕΣ ΕΞΕΤΑΣΕΙΣ Γ' ΤΑΞΗΣ
ΗΜΕΡΗΣΙΩΝ ΛΥΚΕΙΩΝ

ΗΜΕΡΟΜΗΝΙΑ ΕΞΕΤΑΣΗΣ: 9/6/2023

ΕΞΕΤΑΖΟΜΕΝΟ ΜΑΘΗΜΑ: ΗΛΕΚΤΡΟΔΕΧΝΙΑ

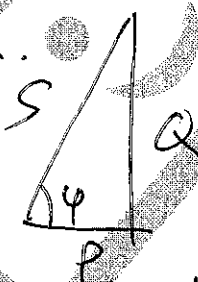
ΠΡΟΤΕΙΝΟΜΕΝΕΣ
ΑΠΑΝΤΗΣΕΙΣ ΘΕΜΑΤΩΝ

ΘΕΜΑ Α

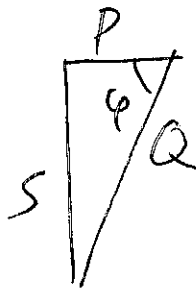
Α1. α. Σ β. Λ γ. Λ δ. Σ ε. Λ
Α2. 1. γ 2. στ 3. α 4. β 5. ε

ΘΕΜΑ Β

Β1. α.



Εφαρμογή
συμπεριφορά



Χωριστή
συμπεριφορά

B2. $u_1 = 230\sqrt{2} \mu\text{m}(314t + 20^\circ)$
 $u_2 = 230\sqrt{2} \mu\text{m}(314t - 100^\circ)$
 $u_3 = 230\sqrt{2} \mu\text{m}(314t - 220^\circ)$

B3. $u = \frac{30}{\sqrt{2}} \mu\text{m}(20\pi t + 45^\circ)$

a) $\varphi_0 = 45^\circ$

b) $U_{\text{eff}} = \frac{U_0}{\sqrt{2}} = \frac{\frac{30}{\sqrt{2}}}{\sqrt{2}} = \frac{30}{\sqrt{2}^2} = \frac{30}{2} = 15\text{V}$

γ) $t=0 \Rightarrow u = \frac{30}{\sqrt{2}} \mu\text{m}45^\circ = \frac{30}{\sqrt{2}} \frac{\sqrt{2}}{2} = 15\text{V}$

δ) $U'_{\text{eff}} = 0,5 U_{\text{eff}} = 0,5 \cdot 15 = 7,5\text{V}$

ΘΕΜΑ Γ

$C = \frac{1}{3} \mu\text{F}$

$U_{\text{eff}} = 100\text{V}$

$I = 10\sqrt{2} \mu\text{m}(500t)$

$X_L = 2X_C$

Γ1. $I_{\text{eff}} = \frac{I_0}{\sqrt{2}} = \frac{10\sqrt{2}}{\sqrt{2}} = 10\text{A}$

$Z = \frac{U_{\text{eff}}}{I_{\text{eff}}} = \frac{100}{10} = 10\Omega$

$$\Gamma 2. X_C = \frac{1}{C\omega} = \frac{1}{\frac{1}{3} \cdot 10^{-3} \cdot 500} = \frac{3}{0,5} = 6 \Omega$$

$$X_L = 2 \cdot X_C = 2 \cdot 6 = 12 \Omega$$

$$Z^2 = (X_L - X_C)^2 + R^2 \rightarrow 10^2 = (12 - 6)^2 + R^2$$

$$\Rightarrow 100 = 36 + R^2 \Rightarrow R^2 = 100 - 36$$

$$\rightarrow R^2 = 64 \Rightarrow R = \sqrt{64} = 8 \Omega$$

$$\Gamma 3. U_{L\varepsilon} = I_{\varepsilon} \cdot X_L = 10 \cdot 12 = 120 \text{ V}$$

$$\Gamma 4. S = U_{\varepsilon} \cdot I_{\varepsilon} = 100 \cdot 10 = 1000 \text{ VA}$$

$$\cos \varphi = \frac{R}{Z} = \frac{8}{10} = 0,8$$

$$P = S \cos \varphi = 1000 \cdot 0,8 = 800 \text{ W}$$

$$\sin \varphi = \frac{X_L - X_C}{Z} = \frac{12 - 6}{10} = \frac{6}{10} = 0,6$$

$$Q = S \sin \varphi = 1000 \cdot 0,6 = 600 \text{ Var}$$

DEMA Δ

$$R = 2\Omega$$

$$L = \frac{40}{n} \text{ mH}$$

$$C = \frac{100}{n} \mu\text{F}$$

$$U = 240\sqrt{2} \text{ V} \text{ } \mu\text{m} (500\text{Hz} + 30^\circ)$$

$$\Delta 1. \quad X_L = L\omega = \frac{40}{n} \cdot 10^3 \cdot 500\text{Hz} = \frac{20000}{1000} = 20\Omega$$

$$X_C = \frac{1}{C\omega} = \frac{1}{\frac{100}{n} \cdot 10^{-6} \cdot 500\text{Hz}} = \frac{1000000}{50000} = 20\Omega$$

ήρα συντονισμός

$$\Delta 2. \quad Z = R = 2\Omega$$

$$U_{\text{eff}} = \frac{U_0}{\sqrt{2}} = \frac{240\sqrt{2}}{\sqrt{2}} = 240\text{V}$$

$$I_{\text{eff}} = \frac{U_{\text{eff}}}{Z} = \frac{240}{2} = 120\text{A}$$

$$\Delta 3. \quad I_{\text{eff}} = \frac{U_0}{\sqrt{2}} = \frac{240\sqrt{2}}{\sqrt{2}} = 240\sqrt{2}\text{A}$$

$$\begin{aligned} \Delta \mu. \quad f_0 &= \frac{1}{2\pi\sqrt{LC}} = \frac{1}{2\pi\sqrt{\frac{40}{n} 10^{-3} \cdot \frac{100}{n} \cdot 10^{-6}}} \\ &= \frac{1}{2\pi\sqrt{\frac{4000}{n^2} 10^{-9}}} = \frac{1}{2\pi\sqrt{\frac{4 \cdot 10^3}{n^2} \cdot 10^{-9}}} = \frac{1}{2\pi\sqrt{\frac{4}{n^2} 10^{-6}}} \\ &= \frac{1}{2\pi \frac{2}{n} 10^{-3}} = \frac{1}{4 \cdot 10^{-3}} = \frac{1000}{4} = 250 \text{ Hz} \end{aligned}$$

$$Q_n = \frac{U_L}{U} = \frac{I_{\varepsilon} \cdot X_L}{I_{\varepsilon} \cdot 2} = \frac{X_L}{2} = \frac{20}{2} = 10$$

