ΑΠΟΛΥΤΗΡΙΕΣ ΕΞΕΤΑΣΕΙΣ Δ΄ ΤΑΞΗΣ
ΕΣΠΕΡΙΝΟΥ ΓΕΝΙΚΟΥ ΛΥΚΕΙΟΥ
ΠΑΡΑΣΚΕΥΗ 23 ΜΑΪΟΥ 2008
ΑΠΑΝΤΗΣΕΙΣ ΣΤΗΝ ΗΛΕΚΤΡΟΛΟΓΙΑ ΤΕΧΝΟΛΟΓΙΚΗΣ ΚΑΤΕΥΘΥΝΣΗΣ

ΟΜΑΔΑ Α

Α.1. β
Α.2. α
Α.3. δ
Α.4. γ
Α.5. α
Α.6. α) Σ, **β)** Λ, **γ)** Σ, **δ)** Λ, **ε)** Σ.
Α.7. 1^{ος} τρόπος

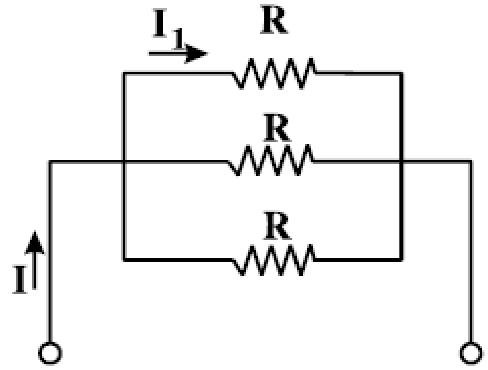
x	y	$\overline{x}$	$\overline{y}$	$x+\overline{y}$	$y+\overline{x}$	$x(y+\overline{x})$	$y(x+\overline{y})$	$x(y+\overline{x})+y(x+\overline{y})$	$\overline{x(y+\overline{x})+y(x+\overline{y})}$	$\overline{x}+\overline{y}$
0	0	1	1	1	1	0	0	0	1	1
0	1	1	0	0	1	0	0	0	1	1
1	0	0	1	1	0	0	0	0	1	1
1	1	0	0	1	1	1	1	1	0	0

2^{ος} τρόπος

$$\overline{x\cdot(y+\overline{x})+y\cdot(x+\overline{y})} = \overline{x\cdot(y+\overline{x})}\cdot\overline{y\cdot(x+\overline{y})}$$
$$= \left(\overline{x}+\overline{(y+\overline{x})}\right)\cdot\left(\overline{y}+\overline{(x+\overline{y})}\right)$$
$$= \left(\overline{x}+\overline{y}\cdot x\right)\cdot\left(\overline{y}+\overline{x}\cdot y\right)$$
$$= \left(\overline{x}+\overline{y}\right)\left(\overline{x}+x\right)\cdot\left(\overline{y}+\overline{x}\right)\left(\overline{y}+y\right)$$
$$= \left(\overline{x}+\overline{y}\right)\cdot\left(\overline{y}+\overline{x}\right) = \overline{x}+\overline{y}$$

ΟΜΑΔΑ Β

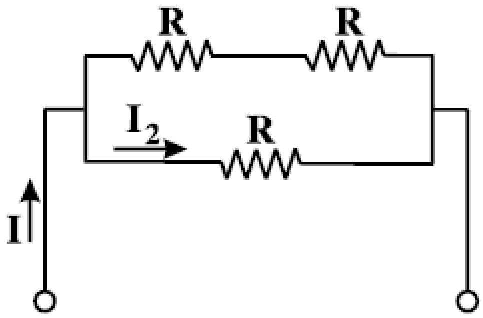
Β.1.



$$R_{ολ} = \frac{R}{3}$$

$$\left.\begin{aligned} V_1 &= I\cdot R_{ολ} \\ V_1 &= I_1\cdot R \end{aligned}\right\} \text{άρα } I\cdot R_{ολ} = I_1\cdot R \Leftrightarrow$$

$$I\cdot\frac{R}{3} = I_1\cdot R \Leftrightarrow I_1 = \frac{I}{3}$$



$$R_{o\lambda} = \frac{2R\cdot R}{2R+R} = \frac{2R}{3}$$

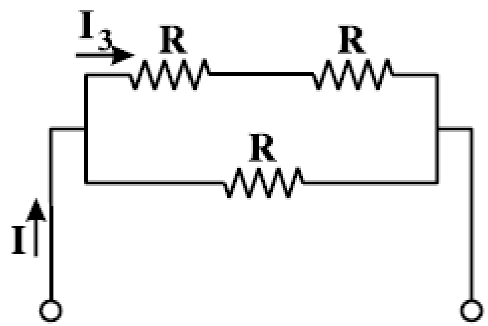
$$\left.\begin{aligned} V_2 &= I\cdot R_{o\lambda} \\ V_2 &= I_2\cdot R \end{aligned}\right\}\ \text{άρα}\ \ I\cdot R_{o\lambda} = I_2\cdot R \ \Leftrightarrow$$

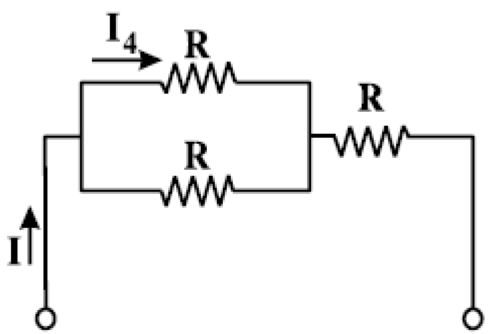
$$I\cdot\frac{2R}{3} = I_2\cdot R \ \Leftrightarrow\ I_2 = \frac{2I}{3}$$

$$R_{o\lambda} = \frac{2R\cdot R}{2R+R} = \frac{2R}{3}$$

$$\left.\begin{aligned} V_3 &= I\cdot R_{o\lambda} \\ V_3 &= I_3\cdot 2R \end{aligned}\right\}\ \text{άρα}\ \ I\cdot R_{o\lambda} = I_3\cdot 2R \ \Leftrightarrow$$

$$I\cdot\frac{2R}{3} = I_3\cdot 2R \ \Leftrightarrow\ I_3 = \frac{I}{3}$$





$$\left.\begin{aligned} V_4 &= I\cdot\frac{R}{2} \\ V_4 &= I_4\cdot R \end{aligned}\right\}\ \text{άρα}$$

$$I\cdot\frac{R}{2} = I_4\cdot R \ \Leftrightarrow\ I_4 = \frac{I}{2}$$

Άρα $\mathbf{I_1 = I_3}$.

Β.2.

$\omega = 100$ rad/sec $\qquad \varphi_0 = 0^o$

α) $X_L = \omega L = 100\cdot 0{,}03 = 3\Omega$

β) $Z = \sqrt{R^2 + X_L{}^2} = \sqrt{3^2 + 3^2} = 3\sqrt{2}\ \Omega$

γ) $\varphi_Z = \text{τοξεφ}\dfrac{X_L}{R} = \text{τοξεφ}\dfrac{3}{3} = \text{τοξεφ}1 = \dfrac{\pi}{4}$

δ) $i = \dfrac{V_0}{z}\cdot\etaμ(\omega t + \varphi_0 - \varphi_z) = \dfrac{300}{3\sqrt{2}}\cdot\etaμ\left(100t - \dfrac{\pi}{4}\right)$

ε) $P = V_{\varepsilon\nu}\cdot I_{\varepsilon\nu}\text{συν}\varphi_z = \dfrac{1}{2}\cdot V_0\cdot I_0\text{συν}\dfrac{\pi}{4} = \dfrac{1}{2}\cdot 300\cdot 50\sqrt{2}\,\dfrac{\sqrt{2}}{2} = 7500$ W

στ) $S = V_{\varepsilon\nu}\cdot I_{\varepsilon\nu} = \dfrac{1}{2}\cdot V_0\cdot I_0 = \dfrac{1}{2}\cdot 300\cdot 50\sqrt{2} = 7500\sqrt{2}$ VA