EXAMPLE OF TEST OF THE UNITS 2 AND 3

Grading criteria:

For correct answer: 2 points
For wrong answer: -2/3 points
No answer: 0 points.

1. Value of Z_1 that makes the real generator (E_g,R_g) deliver the maximum power in the following circuit

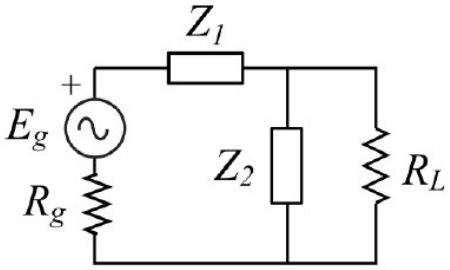


Figura 1

Datos: $\begin{cases} R_g = 100\ \Omega \\ Z_2 = 200j\ \Omega \\ R_L = 200\ \Omega \end{cases}$

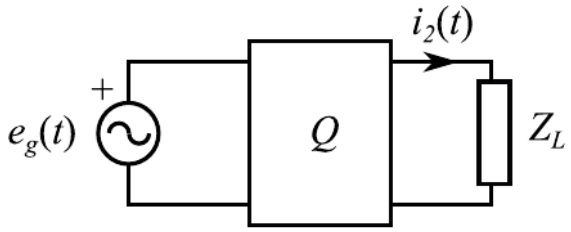
(a) $Z_1 = 100j\ \Omega$

(b) $Z_1 = 200j\ \Omega$

(c) $Z_1 = -200j\ \Omega$

(d) $Z_1 = -100j\ \Omega$

2. Knowing two of the parameters "*y*" ($y_{22} = 0$ and $y_{21} = 1\Omega^{-1}$) of the quadripole, *Q*, of the figure, and knowing that $e_g(t) = 2\sin(\omega t)$ V, then the current $i_2(t)$ is



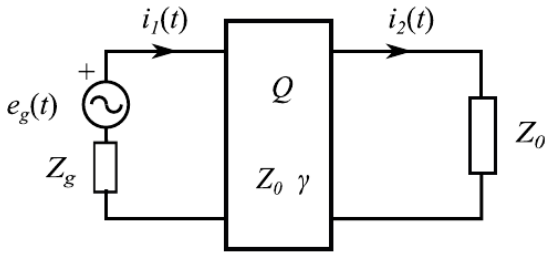
(a) $i_2(t) = 2 \cdot \text{sen}(\omega t)$ A.....

(b) $i_2(t) = 2 \cdot \text{sen}(\omega t + \pi)$ A.....

(c) $i_2(t) = 0$ A.....

(d) Can not be obtained without knowing y_{11} and y_{12}.

3. In the circuit of the figure $i_1(t) = 6\cos(\omega t + \frac{\pi}{4})$ A and $i_2(t) = 3\cos(\omega t - \frac{\pi}{4})$ A, then the image parameters are



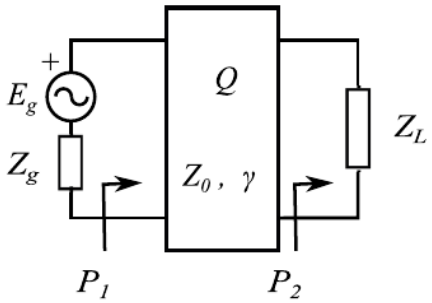
(a) $\gamma = \mathrm{Ln}(2) + j\frac{\pi}{2}$.....

(b) $\gamma = \mathrm{Ln}(2) + j\frac{\pi}{4}$.....

(c) $\gamma = \mathrm{Ln}(2) - j\frac{\pi}{2}$.....

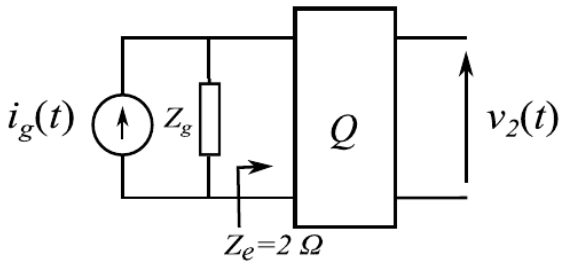
(d) $\gamma = \mathrm{Ln}(2)$.....

4. In the circuit of the figure, where the quadripole, *Q*, is reciprocal and symmetric, with image parameters $Z_0(\Re\{Z_0\} \neq 0)$ and $\gamma = \alpha + j\beta(\beta \neq 0)$, we can say that



(a) Independently of the value of Z_g, if Z_L=Z_0, then $P_1 = P_2 \cdot \mathrm{e}^{2\gamma}$.
(b) Independently of the value of Z_L, if Z_g=Z_0, then $P_1 = P_2 \cdot \mathrm{e}^{2\gamma}$.
(c) Independently of the value of Z_g, if Z_L=Z_0, then $P_1 = P_2 \cdot \mathrm{e}^{2\alpha}$.
(d) Independently of the value of Z_L, if Z_g=Z_0, then $P_1 = P_2 \cdot \mathrm{e}^{2\alpha}$.

5. For the circuit of the figure the quadripole, *Q*, is reciprocal and symmetrical quadripole, and the following values are known: $Z_e = 2\Omega$, $v_2(t) = \sin(\omega t - \pi)$V, $i_g(t) = 3\sin(\omega t)$ and $Z_g = 1\Omega$. The "g" parameters of the quadripole are:



(a) $g_{11} = \frac{1}{2}\,\Omega^{-1}$, $g_{12} = \frac{1}{2}$, $g_{21} = -\frac{1}{2}$, $g_{22} = \frac{3}{2}\,\Omega$.....

(b) $g_{11} = 2\,\Omega^{-1}$, $g_{12} = \frac{1}{2}$, $g_{21} = -\frac{1}{2}$, $g_{22} = \frac{1}{2}\,\Omega$. .....

(c) $g_{11} = \frac{1}{2}\,\Omega^{-1}$, $g_{12} = -\frac{1}{2}$, $g_{21} = \frac{1}{2}$, $g_{22} = \frac{3}{2}\,\Omega$.....

(d) None of the previous one.

Answers:
1. (d)
2. (b)
3. (a)
4. (c)
5. (a)
(do not memorize the answers to the solutions, try do understand and if you have questions please ask your teacher !!)