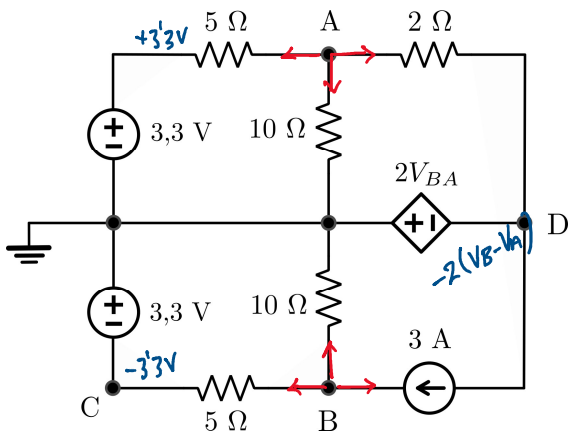


Examen 22 junio 2021 - Continua



Ecuaciones de nodo:

$$\text{NODO A} \quad \frac{V_A}{10} + \frac{V_A - 3.3}{5} + \frac{V_A - (-2(V_B - V_A))}{2} = 0$$

$$\text{NODO B} \quad \frac{V_B}{10} - 3 + \frac{V_B + 3.3}{5} = 0$$

La tensión en el nodo D es conocida luego no se plantea ecuación.

$$V_B \left( \frac{1}{10} + \frac{1}{5} \right) = 3 - \frac{3.3}{5} \rightarrow V_B = \frac{2.34}{0.3} = 7.8 \text{ V}$$

$$\frac{V_A}{10} + \frac{V_A - 3.3}{5} + \frac{V_A + 2V_B - 2V_A}{2} = 0$$

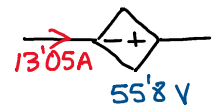
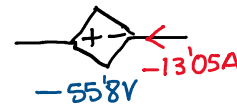
$$V_D = -2(7.8 - 3.3) = 5.58 \text{ V}$$

$$V_A \left( \frac{1}{10} + \frac{1}{5} - \frac{1}{2} \right) = \frac{3.3}{5} - 7.8 ; \quad V_A = 3.57 \text{ V}$$

En el nodo D  $3 + I + \frac{5.58 - 3.57}{2} = 0 ; I = -1.05 ;$  luego

$$P = 1.05 \cdot 5.58 = 7.28 \text{ W}$$

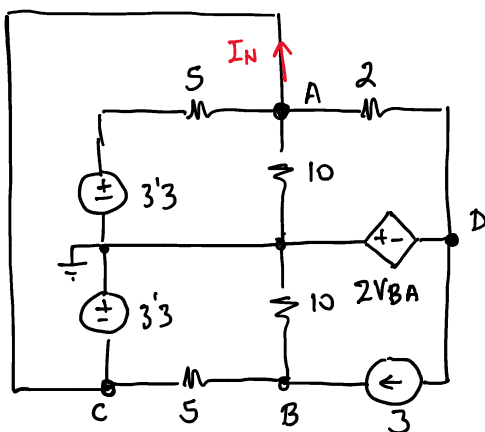
Tensión de Thévenin:  $V_{AC} = 3.57 - (3.3) = 39 \text{ V}$



CRITERIO DE GENERADOR  $P > 0$

La resistencia de Thévenin se tiene que calcular de dos maneras:

INTENSIDAD DE CORTOCIRCUITO



$$V_A = V_C = -3.3 \text{ V}$$

$$\text{NODO B} \quad \frac{V_B + 3.3}{5} - 3 + \frac{V_B}{10} = 0 \rightarrow V_B = 7.8 \text{ V}$$

$$V_D = -2(V_B - V_A) = -2(7.8 + 3.3) = -22.2 \text{ V}$$

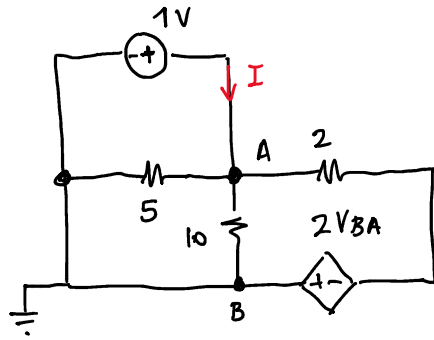
$$I_N + \frac{(-3.3)}{10} + \frac{(-3.3 + 22.2)}{2} + \frac{-3.3 - 3.3}{5} = 0$$

$$I_N = -7.8 \text{ A} ; \text{ luego}$$

$$R_{th} = \frac{V_{th}}{I_N} = \frac{39}{-7.8} = -5 \Omega$$



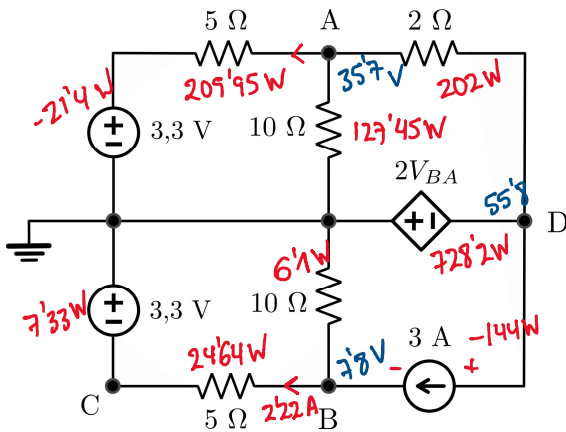
FUENTE DE PRUEBA.



$$I = \frac{1}{5} + \frac{1}{10} + \frac{1+2(0-1)}{2}$$

$$I = -0.2 \text{ A}$$

$$R_{th} = \frac{1}{-0.2} = -5 \Omega$$



POTENCIAS EN RESISTENCIAS

$$\begin{array}{r} 202 \\ 127.45 \\ 246.4 \\ 6.1 \\ \hline 209.95 \\ 570.16 \text{ W} \end{array}$$

POTENCIAS EN FUENTES

$$\begin{array}{r} 728.2 \\ -144 \\ 7.33 \\ -21.4 \\ \hline 570.13 \text{ W} \end{array}$$

