ANEXOS LABORATORIO 5

Guamán Jhennifer, Lema Brianda, Mayorga Christopher

Universidad de las Fuerzas Armadas, Av. General Rumiñahui s/n Sangolquí-Ecuador
(jtguaman, blema, cdmayorga3)@espe.edu.es
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Laboratorio de Circuitos Eléctricos NRC: 8703
Instructor: Darwin Alulema

ANEXOS

Cálculos circuito equivalente Thévenin

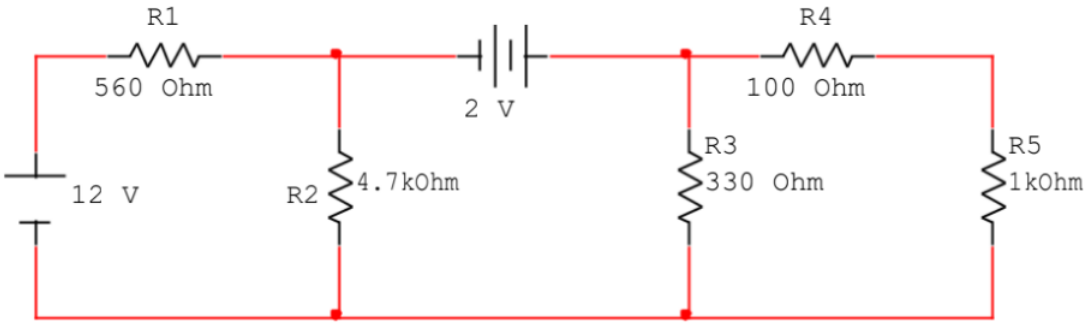

Figure 1. Circuito para comprobar el Teorema de Thévenin

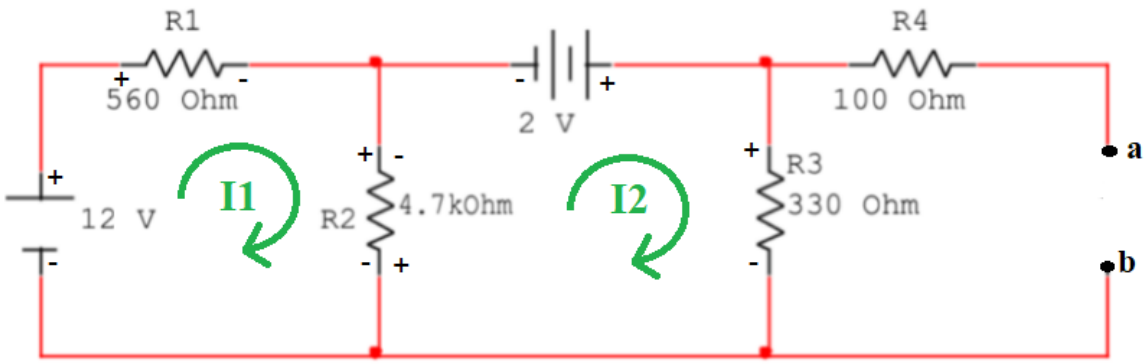

Figure 2. Primer paso, quitamos R5 y lo convertimos en una tensión en circuito abierto

MÉTODO DE MALLAS

M1

$$12V - 560I_1 - 4700I_1 + 4700I_2 = 0$$
$$-5260I_1 + 4700I_2 = -12$$

M2

$$2V - 330I_2 - 4700I_2 + 4700I_1 = 0$$
$$-5030I_2 + 4700I_1 = -2$$

I_1	I_2	RTA
-5260	4700	-12
-5030	4700	-2

$$I_1 = 0,01597A$$

$$I_2 = 0,01532A$$

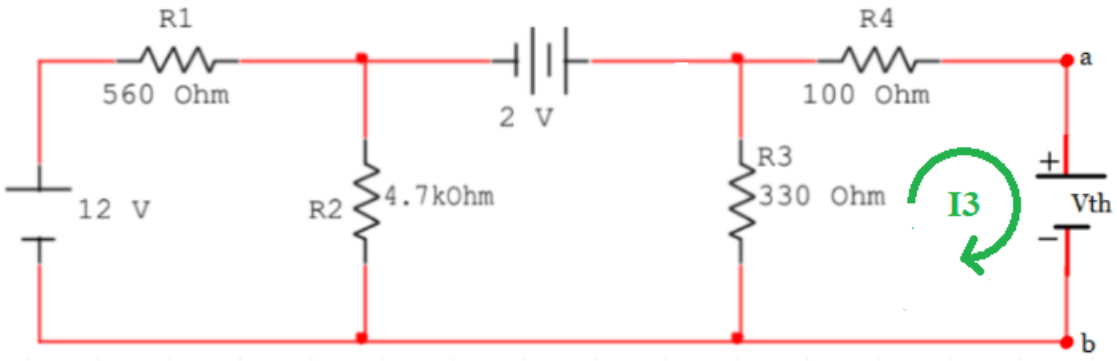

Figure 3. Calculamos el voltaje de Thévenin

M3

$$
\begin{aligned}
-Vth + 330I_2 &= 0 \\
Vth &= 330I_2 \\
Vth &= 330(0,01532A) \\
Vth &= 5.0556V
\end{aligned}
$$

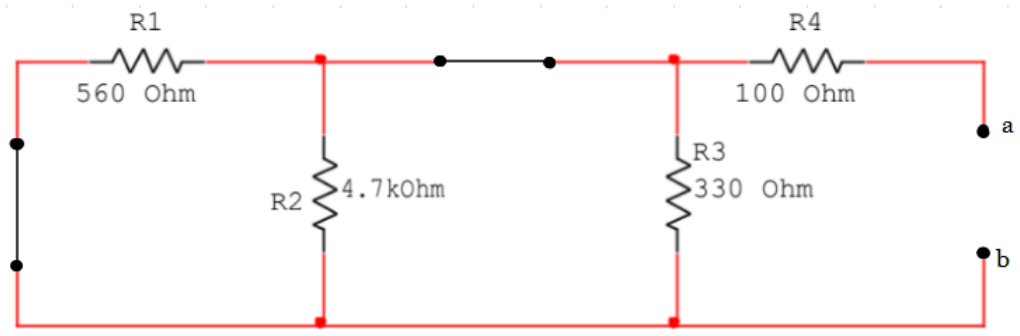

Figure 4.

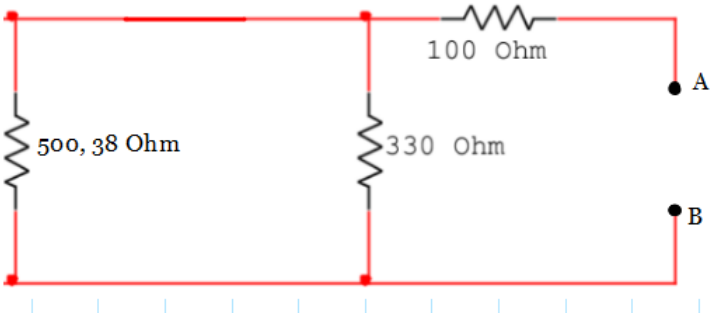

Figure 5.

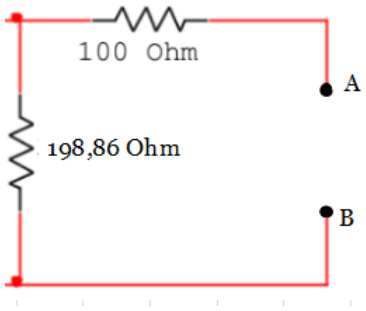

Figure 6.

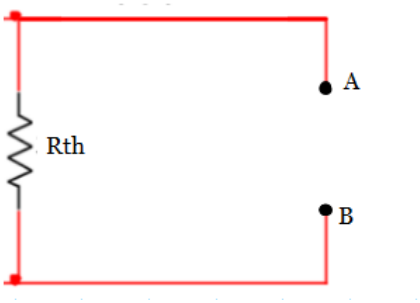

Figure 7.

$$Rth = 100 + 198,86$$
$$Rth = 298,86Ohm$$

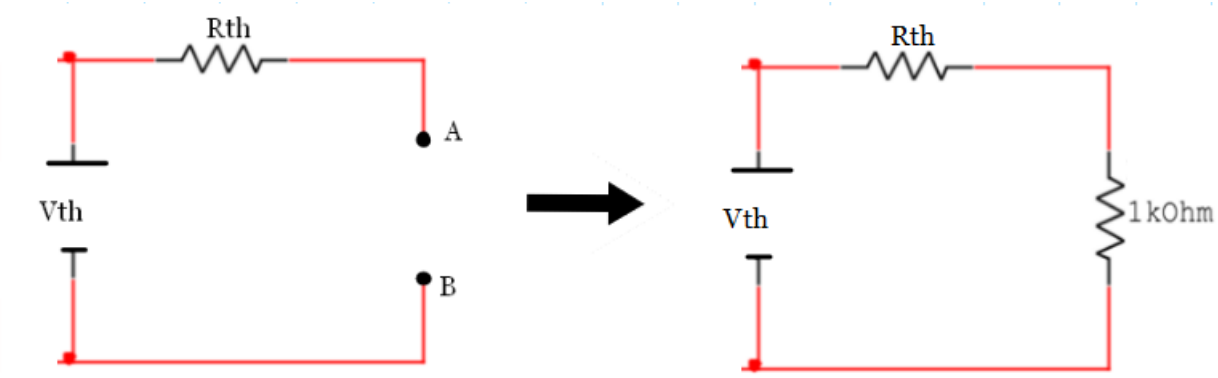

Figure 8.

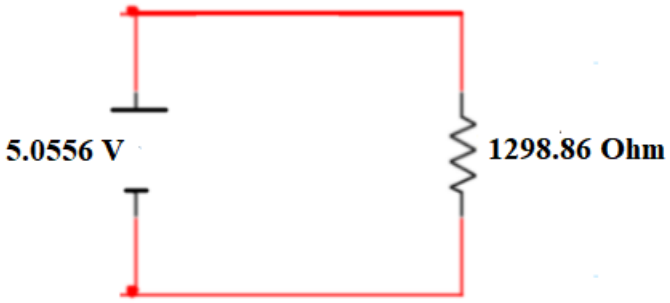

Figure 9.

$$I = \frac{V}{R}$$

$$I = \frac{5.0556V}{1298,86Ohm}$$

$$I = 3.89mA$$

$$V = R \times I$$

$$V = 1000Ohm \times 3.89 \cdot 10^{-3}A$$

$$V = 3.89V$$

CÁLCULOS CIRCUITO ORIGINAL

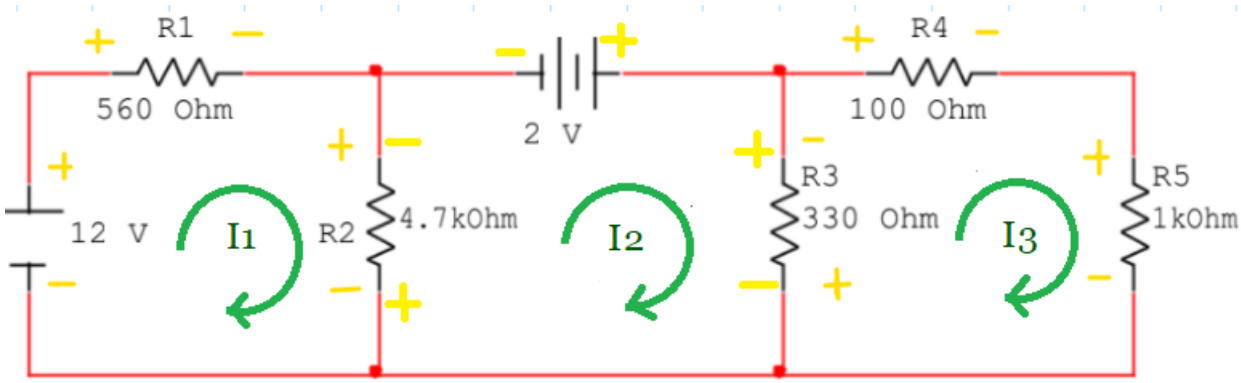

Figure 10. Circuito con direcciones de intensidades definidas

MÉTODO DE MALLAS

Malla 1

$$12V - 560I_1 - 4700I_1 + 4700I_2 = 0$$
$$-5260I_1 + 4700I_2 = -12$$

Malla 2

$$-4700I_2 + 4700I_1 + 2V - 330I_2 + 330I_3 = 0$$
$$4700I_1 - 5030I_2 + 330I_3 = -2$$

Malla 3

$$-330I_3 + 330I_2 - 100I_3 - 1000I_3 = 0$$
$$330I_2 - 1430I_3 = 0$$

I_1	I_2	I_3	RTA
-5260	4700	0	-12
4700	-5030	330	-2
0	330	-1430	0

$$I_1 = 0,0174A$$

$$I_2 = 0,0169A$$

$$I_3 = 0,0039A$$

$$I_{R5} = 0,0039A$$

$$I_{R5} = 3.9mA$$

$$V_{R5} = R5 \times I_{R5}$$

$$V_{R5} = 1000Ohm \times 3.9 \cdot 10^{-3}A$$

$$V_{R5} = 3.9V$$