POTENCIA CALCULADA TEORICAMENTE (W)

$\boldsymbol{R_L = 220\Omega}$

$$\mathrm{I} = \frac{V}{\mathrm{R_T}} = \frac{15}{1200 + 220} = \mathbf{0.01056}[\boldsymbol{A}].$$

$$\mathrm{V_{RL}} = 0.01056[\mathrm{A}] * 220[\Omega] = \mathbf{2.3232}[\mathbf{V}]$$

$$\mathrm{P} = \mathrm{V} * \mathrm{I} = 2.3232[\mathrm{V}] * 0.01056[\mathrm{A}] = \mathbf{0.02453}\ [\mathbf{W}]$$

$\boldsymbol{R_L = 470\Omega}$

$$\mathrm{I} = \frac{V}{\mathrm{R_T}} = \frac{15}{1200 + 470} = \mathbf{8.982x10^{-3}}[\boldsymbol{A}]$$

$$\mathrm{V_{RL}} = 8.982\mathrm{x}10^{-3}[\mathrm{A}] * 470[\Omega] = \mathbf{4.2215}[\mathbf{V}]$$

$$\mathrm{P} = \mathrm{V} * \mathrm{I} = 4.2215[\mathrm{V}] * 8.982\mathrm{x}10^{-3} = \mathbf{0.03791}\ [\mathbf{W}]$$

$\boldsymbol{R_L = 680\Omega}$

$$\mathrm{I} = \frac{V}{\mathrm{R_T}} = \frac{15}{1200 + 680} = \mathbf{7.9787x10^{-3}}[\boldsymbol{A}]$$

$$\mathrm{V_{RL}} = 7.9787\mathrm{x}10^{-3}[\mathrm{A}] * 680[\Omega] = \mathbf{5.4255}[\mathbf{V}]$$

$$\mathrm{P} = \mathrm{V} * \mathrm{I} = 5.4285[\mathrm{V}] * 7.9787\mathrm{x}10^{-3} = \mathbf{0.04328}\ [\mathbf{W}]$$

$\boldsymbol{R_L = 820\Omega}$

$$\mathrm{I} = \frac{V}{\mathrm{R_T}} = \frac{15}{1200 + 820} = \mathbf{7.4257x10^{-3}}[\boldsymbol{A}]$$

$$\mathrm{V_{RL}} = 7.4257\mathrm{x}10^{-3}[\mathrm{A}] * 820[\Omega] = \mathbf{6.0890}[\mathbf{V}]$$

$$\mathrm{P} = \mathrm{V} * \mathrm{I} = 6.0890[\mathrm{V}] * 7.4257\mathrm{x}10^{-3} = \mathbf{0.04521}\ [\mathbf{W}]$$

$\boldsymbol{R_L = 1000\Omega}$

$$\mathrm{I} = \frac{V}{\mathrm{R_T}} = \frac{15}{1200 + 1000} = \mathbf{6.8181x10^{-3}}[\boldsymbol{A}]$$

$$V_{RL} = 6.8181x10^{-3}[A] * 1000[\Omega] = \mathbf{6.8181}[\mathbf{V}]$$

$$P = V * I = 6.8181[V] * 6.8181x10^{-3} = \mathbf{0.04648}\ [\mathbf{W}]$$

$$\underline{\boldsymbol{R_L = 1500\Omega}}$$

$$I = \frac{V}{R_T} = \frac{15}{1200 + 1500} = \mathbf{5.5555x10^{-3}}[\boldsymbol{A}]$$

$$V_{RL} = 5.5555x10^{-3}[A] * 1500[\Omega] = \mathbf{8.3333}[\mathbf{V}]$$

$$P = V * I = 8.3333[V] * 5.5555x10^{-3} = \mathbf{0.04629}\ [\mathbf{W}]$$

$$\underline{\boldsymbol{R_L = 1800\Omega}}$$

$$I = \frac{V}{R_T} = \frac{15}{1200 + 1800} = \mathbf{5x10^{-3}}[\boldsymbol{A}]$$

$$V_{RL} = 5x10^{-3}[A] * 1800[\Omega] = \mathbf{9}[\mathbf{V}]$$

$$P = V * I = 9[V] * 5x10^{-3} = \mathbf{0.045}\ [\mathbf{W}]$$

$$\underline{\boldsymbol{R_L = 2200\Omega}}$$

$$I = \frac{V}{R_T} = \frac{15}{1200 + 2200} = \mathbf{4.4117x10^{-3}}[\boldsymbol{A}]$$

$$V_{RL} = 4.4117x10^{-3}[A] * 2200[\Omega] = \mathbf{9.7058}[\mathbf{V}]$$

$$P = V * I = 9.7058[V] * 4.4117x10^{-3} = \mathbf{0.04281}\ [\mathbf{W}]$$

$$\underline{\boldsymbol{R_L = 3900\Omega}}$$

$$I = \frac{V}{R_T} = \frac{15}{1200 + 3900} = \mathbf{2.9411x10^{-3}}[\boldsymbol{A}]$$

$$V_{RL} = 2.9411x10^{-3}[A] * 3900[\Omega] = \mathbf{11.4705}[\mathbf{V}]$$

$$P = V * I = 11.4705[V] * 2.9411x10^{-3} = \mathbf{0.03373}\ [\mathbf{W}]$$

$$\underline{\boldsymbol{R_L = 4700\Omega}}$$

$$I = \frac{V}{R_T} = \frac{15}{1200 + 4700} = \mathbf{2.5423x10^{-3}}[\boldsymbol{A}]$$

$$V_{RL} = 2.5423x10^{-3}[A] * 4700[\Omega] = \mathbf{11.9491[V]}$$

$$P = V * I = 11.9491[V] * 2.5423x10^{-3} = \mathbf{0.03037}\ [\mathbf{W}]$$

POTENCIA CALCULADA EXPERIMENTALMENTE (W)

$$P = \left(\frac{\boldsymbol{V_{TH}}}{\boldsymbol{R_{TH} + R_L}}\right)^2 * \boldsymbol{R_L}$$

Ohmios [Ω]	***220***	***470***	***680***	***820***	***1000***	***1500***	***1800***	***2200***	***3900***	***4700***
Resultados:	0.02454	0.03791	0.04328	0.04521	0.04648	0.04629	0.045	0.04282	0.03373	0.03037

Tabla 1. Parámetros Eléctricos del circuito de la figura.

$\boldsymbol{R_L[\Omega]}$	***Corrientes medidas [mA]***	***Voltaje medido [V]***	***Potencia calculada experimentalmente [W]***	***Potencia calculada teoricamente [W]***
220	10.6	2.32	0.02454	0.02453
470	8.98	4.22	0.03791	0.03791
680	7.98	5.43	0.04328	0.04328
820	7.43	6.09	0.04521	0.04521
1000	6.82	6.82	0.04648	0.04648
1500	5.56	8.33	0.04629	0.04629
1800	5	9	0.045	0.045
2200	4.41	9.71	0.04282	0.04281
3900	2.94	11.5	0.03373	0.03373
4700	2.54	11.9	0.03037	0.03037

CALCULOS DE LOS PORCENTAJES DE ERROR

$$\boldsymbol{Error\ W\% = \left|\frac{Valor\ Teorico - Valor\ Calculado}{Valor\ Teorico}\right| * 100}$$

Resistencia [Ohm]	*Fórmula*
220	$\boldsymbol{Error\ W\% = \left\|\frac{0.02454 - 0.02453}{0.02454}\right\| * 100 = 0\%}$
470	$\boldsymbol{Error\ W\% = \left\|\frac{0.03791 - 0.03791}{0.03791}\right\| * 100 = 0\%}$
680	$\boldsymbol{Error\ W\% = \left\|\frac{0.04328 - 0.04328}{0.04328}\right\| * 100 = 0\%}$
820	$\boldsymbol{Error\ W\% = \left\|\frac{0.04521 - 0.04521}{0.04521}\right\| * 100 = 0\%}$
1000	$\boldsymbol{Error\ W\% = \left\|\frac{0.4648 - 0.4648}{0.4648}\right\| * 100 = 0\%}$
1500	$\boldsymbol{Error\ W\% = \left\|\frac{0.04629 - 0.04629}{0.04629}\right\| * 100 = 0\%}$
1800	$\boldsymbol{Error\ W\% = \left\|\frac{0.045 - 0.045}{0.045}\right\| * 100 = 0\%}$
2200	$\boldsymbol{Error\ W\% = \left\|\frac{0.04282 - 0.04281}{0.04282}\right\| * 100 = 0\%}$
3900	$\boldsymbol{Error\ W\% = \left\|\frac{0.03373 - 0.03373}{0.03373}\right\| * 100 = 0\%}$
4700	$\boldsymbol{Error\ W\% = \left\|\frac{0.03037 - 0.03037}{0.03037}\right\| * 100 = 0\%}$