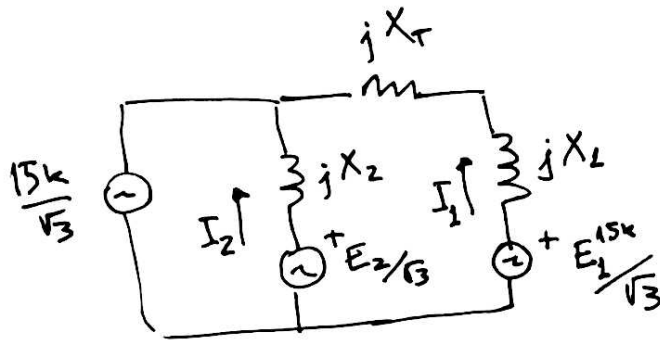


# SOLUCIÓN EJERCICIO 2

1)



$$\boxed{E_2 = 350 i_2}$$

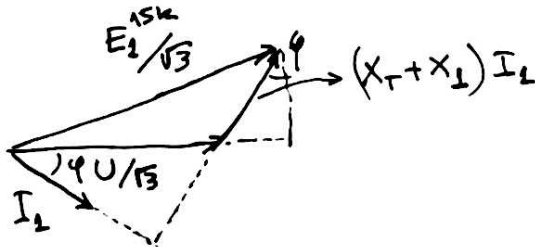
$$\boxed{X_2 = 0.13 \times \frac{15^2}{3} = 9.75 \Omega}$$

$$\boxed{E_1^{15k} = \frac{15}{2.1} \times 100 i_1 = 714.3 i_1}$$

$$\boxed{X_L = 0.11 \times \frac{2^2}{1.5} \times \frac{15^2}{2.1^2} = 14.97 \Omega}$$

$$\boxed{X_T = 0.045 \times \frac{15^2}{1.2} = 8.438 \Omega}$$

2)



$$i_2 = 0.64 \times 35 = 22.4 \text{ A} \Rightarrow$$

$$\Rightarrow E_1^{15k} = 16000 \text{ V}$$

$$\left(\frac{E_1^{15k}}{\sqrt{3}}\right)^2 = \left(\frac{U}{\sqrt{3}} + (X_T + X_L) I_1 \sin \varphi\right)^2 + \left((X_T + X_L) I_1 \cos \varphi\right)^2$$

Limita el trafeo.:  $I_1 = \frac{1.2}{0.015 \times \sqrt{3}} = 46.19 \text{ A}$

$$X = X_T + X_L = 23.41 \Omega$$

$$\left(\frac{E_1^{15k}}{\sqrt{3}}\right)^2 = \left(\frac{U}{\sqrt{3}}\right)^2 + (X I_1)^2 + 2 \frac{U}{\sqrt{3}} X I_1 \sin \varphi \Rightarrow$$

$$\Rightarrow \sin \varphi = \frac{\left(\frac{E_1^{15k}}{\sqrt{3}}\right)^2 - \left(\frac{U}{\sqrt{3}}\right)^2 - (X I_1)^2}{2 \frac{U}{\sqrt{3}} X I_1} = 0.4893 \Rightarrow \varphi = 29.30^\circ$$

$$\boxed{P = 1.2 \text{ M} \cos \varphi = 1046 \text{ kW}}$$

$$\boxed{Q = 1.2 \text{ M} \sin \varphi = 587.3 \text{ kVAr}}$$

3)  $Q = -587.3 \text{ kVAr}$ ,  $S = 3 \text{ MVA} \Rightarrow P = 2942 \text{ kW} \Rightarrow$  limita máxima  
motriz:  $P = 2500 \text{ kW}$ .

$$E_2^2 = \left(U + \frac{X_2 Q}{U}\right)^2 + \left(\frac{X_2 P}{U}\right)^2 \Rightarrow E_2 = 14708 \text{ V}$$

$$\Rightarrow i_2 = 42.02 \text{ A}$$

