II parte

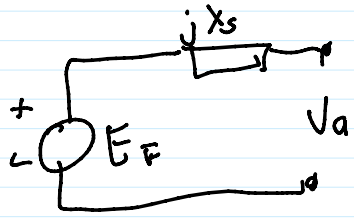
viernes, 11 de diciembre de 2020 18:53

Polos = 4 → Y

380 V_{linea}, 50 Hz, $X_s = 0,8\ \Omega/fase$, $I_a = 50\ A$, $f_p = 0,85$ retraso.

perdidas 1KW fricción, 0,8KW nucleo

Circuito Equivalente por fase



$V_a = E_F - jX_s I_a$ $\qquad E_f = \frac{380}{\sqrt{3}} = 219,4\ V_\phi$

$\delta = sen^{-1}\left(\frac{X_s I_a \cos\theta}{E_f}\right)$

$\delta = sen^{-1}\left(\frac{0,8 \cdot 50 \cdot 0,8}{219,4}\right) = 8,3°$

Fp Adelanto 0,8 → $\theta = 36,87°$

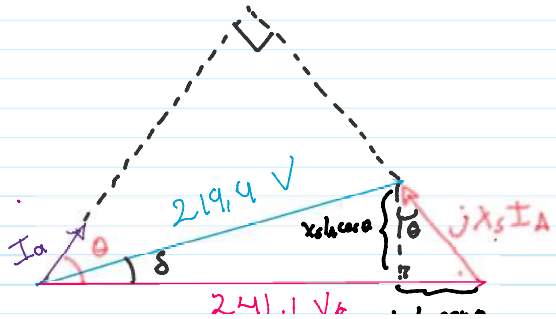
$|V_a| = V_\phi \cdot \cos(\delta) + X_s \cdot I_a \cdot sen\,\theta$

$|V_a| = 219,4 \cdot \cos(8,3°) + 0,8 \cdot 50 \cdot sen(36,87)$

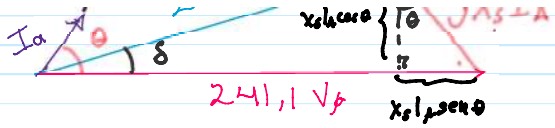
$|V_a| = 241,10\ V_\phi$ → $V_{Linea} = 241,10 \cdot \sqrt{3}$

$V_{Linea} = 417,6\ V$ a)

Diagrama fasorial



b)



c) $\eta = \frac{P_{sal}}{P_{ent}} \cdot 100 = \frac{\sqrt{3}\, V_a I_a \overbrace{\cos\theta}^{0,85}}{\sqrt{3}\, V_a I_a \cos\theta + P_{perdidas}} \cdot 100$

$\eta = \frac{\sqrt{3} \cdot 380 \cdot 0,85 \cdot 50}{50 \cdot \sqrt{3} \cdot 380 \cdot 0,85 + 1,8kW} \cdot 100$

$\eta_b = 93,95\ \%$ C