Exercici 20 pàgina 144

a) $I = I_d + I_i$

$I_d = \dfrac{VL}{Rd} = \dfrac{420}{210} = 2$ A

$I_i = I - I_d = 32 - 2 = 30$ A

$I_i = \dfrac{VL - \mathcal{E} - 2Vco}{r + Rc}$

$- \mathcal{E} = I_i \cdot (r + Rc) + 2 - V_L = 30 \cdot (0,2 + 0,4) + 2 - 420 = -400$ A

$\mathcal{E}$ = 400 A

b) $P_i = \mathcal{E} \cdot I_i = 400 \cdot 30 = 12 \cdot 10^3$ W

$P_{abs} = V_L \cdot I = 410 \cdot 32 = 13,44 \cdot 10^3$ W

$\eta_e = \dfrac{Pi}{Pabs} = \dfrac{12 \cdot 10^3}{13,44 \cdot 10^3} \cdot 100 = 89,28$ %

$P_U = P_i - P_{mec} = 12 \cdot 10^3 - 160 = 11,84 \cdot 10^3$ W

$\eta_{mec} = \dfrac{Pu}{Pi} = \dfrac{11,84 \cdot 10^3}{12 \cdot 10^3} \cdot 100 = 98,67$ %

$\eta_t = \eta_e \cdot \eta_{mec} = 0,8928 \cdot 0,9867 \cdot 100 = 88,09$ %

c) $\Gamma_u = \dfrac{Pu}{W} = \dfrac{Pu}{2\prod n} = \dfrac{11,84 \cdot 10^3}{2 \cdot \prod \cdot 16,666} = $ 113,1 N · m

$\Gamma_i = \dfrac{Pi}{W} = \dfrac{Pi}{2\prod n} = \dfrac{12 \cdot 10^3}{2 \cdot \prod \cdot 16,666} = $ 114,6 N · m

d) $I_a = \dfrac{VL - \mathcal{E} - 2Vco}{r + Rc + Ra}$

$I_a = 1,5 \cdot I_i = 1,5 \cdot 30 = 45\ A$

$R_a = \dfrac{VL - Vco}{Ia} - r - R_C = \dfrac{420 - 2}{45} - 0,2 - 0,4 = $ 8,689 Ω