1) $n_{S_{MI}} = 1500$ rpm $(p_{MI} = 2)$

$n_{S_{MS}} = 1500$ rpm $(p_{MS} = 2)$

MS conectada a red potencia infinita 50Hz $\Rightarrow$ $n = 1500$ rpm (tres maquinas)

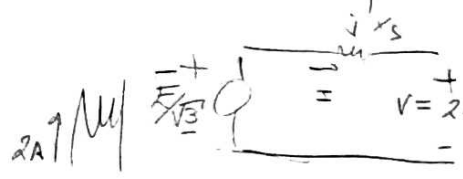
$\Rightarrow$ MI funciona en vacio $(g = 0) \Rightarrow$ No suministra potencia mecanica a MS

Mcc: $A\phi(i) = \frac{2}{30} \cdot i \Rightarrow A\phi(1,1) = \frac{1,2}{30} \Rightarrow E = \frac{1,2}{30} \times 1500 = 110V$

Como la maquina es alimentada a 110V $\Rightarrow I = 0$ Mcc en vacio

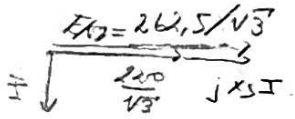
$\Rightarrow$ Mcc No suministra potencia mecanica a MS

$\Rightarrow$ MS No absorve potencia mecanica $\Rightarrow$ $P_{MS} = 0$ (suministrada a la red)



$E = 150 \times 1,75 = 262,5V$

$X_S = 0,2 \times \frac{220^2}{20 \times 10^3} = 0,484\ \Omega$



$X_S I = 247V \Rightarrow I = 511A \Rightarrow Q_{MS} = \sqrt{3} \times 220 \times 511 = 194$ KVAR

2) $C_{Mcc} + C_{MI} = 0$ (equilibrio)

$C_{MI} = \frac{220^2}{157 \times R_{2e}} \times g$

$C_{Mcc} = \frac{30}{\pi} \frac{E \cdot I}{n} = \frac{30}{\pi} A\phi(1,1) I = \frac{30}{\pi} \times \frac{1,2}{30} \times I$

$I = \frac{110 - E}{R} = \frac{110 - A\phi(1,1) n}{1}$

$n = 1500(1-g)$

$C_{Mcc} = \frac{30}{\pi} \times \frac{1,2}{30} (110 - A\phi(1,1) \times n)$

$C_{Mcc} = 77 \times g$

Obs. $n = 1500 \Rightarrow \begin{cases} C_{Mcc} = 0 \\ C_{MI} = 0 \end{cases} \Rightarrow n = 1500$ rpm Solucion $\Rightarrow$ MI y Mcc en vacio

$P_{MI} = 800W$ (absorvida de la red)

3) $A\phi(1,5) = 91 \Rightarrow C_{Mcc} = \frac{30}{\pi} \times 0,1 [0,1 \times 1500(1-g) - 110] = 0,95[150 - 110 - 150g]$

$I = \frac{E - V}{R}$ (generador) $\quad C_{Mcc} = -142,5g + 38$

MI: $Z_a = \frac{25/\sqrt{3}}{50} \angle \arccos\left(\frac{1600}{\sqrt{3} \times 25 \times 50}\right) = 0,29 \angle 42,3° = 0,21 + j\,0,19\ \Omega$ $\quad R_1 = 0,12\ \Omega$

$R_{2e} = 0,09\ \Omega$

$C_{MI} = \frac{220^2}{157 \times 0,09} \cdot g$ $\Rightarrow$ $C_{Mcc} = C_{MI}$ (Mcc como generador) $\Rightarrow -142,5g + 38 = 3425,3 \times g$

$\Rightarrow g = 0,012 \Rightarrow n = 1482$ rpm $\quad E = 0,1 \times 1482 = 1482V \Rightarrow I = 38,2A$