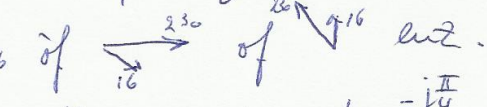
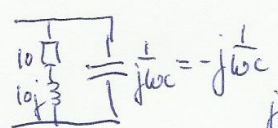
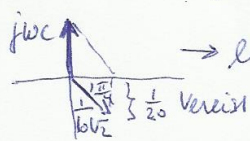


Uitwerking MotI1-T1 d.d. 07-04-2016

① a) $Q = |E|/|I| \cos \varphi$ $I = \frac{230}{10\sqrt{2}} \cdot e^{j\frac{\pi}{4}}$ $\varphi = \frac{\pi}{4}$ $Q = 2,645 \text{ kVA}_r$

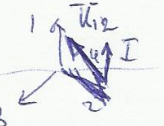
b) $I = \frac{230}{10\sqrt{2}} e^{-j\frac{\pi}{4}} = 16,3 e^{-j\frac{\pi}{4}}$ 

c)  $Y_{tot} = \frac{1}{10+j0} + j\omega C = \text{reëel} = j\omega C + \frac{1}{10\sqrt{2}} e^{-j\frac{\pi}{4}}$



②

a) $\sum I_{sterpunt} = 0 = \frac{U_1 - U_s}{10} + \frac{U_2 - U_s}{10} + \frac{U_3 - U_s}{10} \rightarrow U_s = \frac{1}{3}(U_1 + U_2 + U_3) = 0$

b) $\varphi_{I \text{ t.o.v. } U_{12}} = \arctan \frac{10}{2} = 27^\circ$  $|I| = \frac{230\sqrt{3}}{\sqrt{10^2 + 20^2}} = 17,8 \text{ A}$ $\varphi = 27^\circ$

c) i.v.m. blindstroom \rightarrow zwaardere bekabeling vereist en $I^2 R$ verliezen

③

a) $n = 995 \cdot \frac{60 \cdot 60}{2} = 1710 \text{ rpm}$

b) $\left\langle \begin{array}{l} \text{ja, mits } t < T_{\text{start}}, \text{ maar t.t. blijft op de kleine} \\ \text{nee, motor komt niet op nominale toerental} \end{array} \right.$
 waarde hangt

c) laag t \rightarrow ventilatie onvoldoende \rightarrow motor wordt (be) heet.

④

a) $(70 + 5 + 2) = 100 \cos \varphi \rightarrow \cos \varphi = 0,77$

b) $\omega_{\text{rotor}} = 2\pi(50 - \frac{1}{2}) = 305 \text{ r/s} \rightarrow P_{\text{bel}} = \omega_{\text{bel}} T_{\text{bel}} \rightarrow T_{\text{bel}} = \frac{70 \cdot 10^3}{305} = 230 \text{ Nm}$

c) $\eta = \frac{70}{77} = 91\%$

⑤

a) om de aanloopstroom te beperken

b) om het veld in de luchtspies constant te houden

c) omdat dan een inductieve belasting ontbreekt. "stroom door spoel is continu".