

11.31

a) Da  $n_n = 950 \text{ rpm}$ , må  $n_1$  være  $1000 \text{ rpm}$

~ motoren er 6-polet

b) Slip  $s_n = \frac{n_1 - n_n}{n_1} \cdot 100\% = \frac{1000 - 950}{1000} = \underline{\underline{5,0\%}}$

c)  $M_n = \frac{P_{2,n}}{\omega_n} = \frac{2200}{2\pi \cdot \frac{950}{60}} = \underline{\underline{22,1 \text{ Nm}}}$

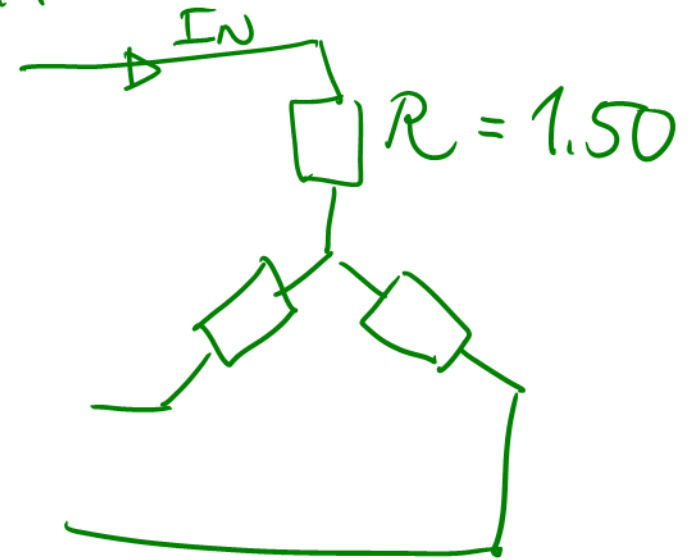
$$d) P_1 = \frac{P_2}{\eta} = \frac{2200}{0,85} = 2588$$

$$P_1 = \sqrt{3} \cdot U_N \cdot I_N \cdot \cos \varphi$$

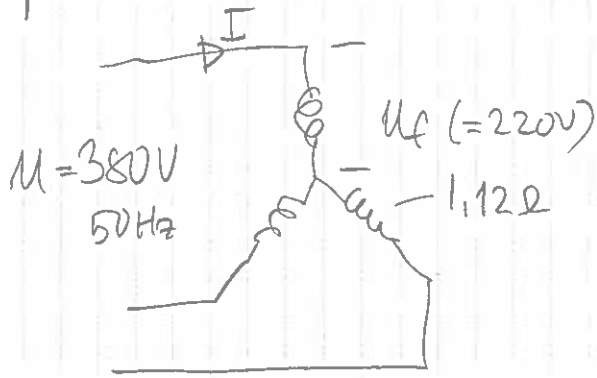
$$I_N = \frac{P_1}{\sqrt{3} \cdot U_N \cdot \cos \varphi} = \frac{2588}{\sqrt{3} \cdot 400 \cdot 0,78} = 4,789 \text{ A}$$

$$P_{\text{cun}} = 3 \cdot I_N^2 \cdot R =$$

$$3 \cdot 4,789^2 \cdot 1,50 = \underline{\underline{103,2 \text{ W}}}$$



11.39

4 poler  $n_0 = 1500 \text{ rpm}$ 

Tomgang:  $I = 5,4 \text{ A}$   
 $P_1 = 526 \text{ W}$

Belastning:  $I = 15,6 \text{ A}$   
 $P_1 = 8945 \text{ W}$   
 $n = 1431 \text{ rpm}$

Slip ved belastning:  $s = \frac{1500 - 1431}{1500} = 4,6\%$

a) Tomgang:  $\cos \varphi = \frac{P_1}{S} = \frac{P_1}{\sqrt{3} \cdot U \cdot I} = \frac{526}{\sqrt{3} \cdot 380 \cdot 5,4}$

$$\cos \varphi = 0,148$$

Belastning:  $\cos \varphi = \frac{P_1}{S} = \frac{8945}{\sqrt{3} \cdot 380 \cdot 15,6} = \underline{\underline{0,871}}$

b) Ved tomgang regnes motor tabet = 0

Tab i staten  $P_{cu1} = 3 \cdot I^2 \cdot R = 3 \cdot 5,4^2 \cdot 1,12 = 98 \text{ W}$

Mekanisk og magnetisk tab  $P_{feg} = 526 - 98 = \underline{\underline{428 \text{ W}}}$

Belastning: Tab i staten  $P_{cu1} = 3 \cdot 15,6^2 \cdot 1,12 = 818 \text{ W}$

Luftspalteeffekt  $P_{1r} = P_{2s} = P_1 - P_{feg} - P_{cu1}$

$$= 8945 - 818 - 428 = 7699 \text{ W}$$

Rotortab  $= s \cdot P_{2s} = 4,6\% \cdot 7699 = 354 \text{ W}$

$$P_2 = (1-s)P_{2s} = 7345 \text{ W}$$

$$\eta = \frac{P_2}{P_1} = \frac{7345}{8945} = \underline{\underline{82,1\%}}$$

c)  $P_2 = M \cdot \omega \Leftrightarrow M = \frac{P_2}{\omega} = \frac{7345}{\frac{2\pi \cdot 1431}{60}} = \underline{\underline{49,0 \text{ Nm}}}$