

4. SZINKRON GÉPEK

4.5. feladat

$$a) n_0 = \frac{f}{p} = \frac{50}{2} = 25 \text{ 1/s} = 1500 \text{ 1/min}$$

$$\omega_0 = 2 \cdot \pi \cdot n_0 = 2 \cdot \pi \cdot 25 = 157,079 \text{ 1/s}$$

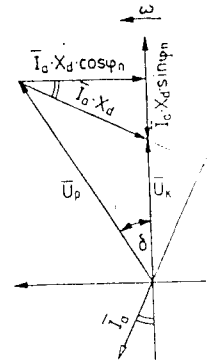
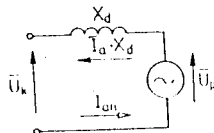
$$b) P = S_n \cdot \cos \varphi = 60 \cdot 0,80 = 48 \text{ kW}$$

$$Q = S_n \cdot \sin \varphi = 60 \cdot 0,6 = 36 \text{ kvar}$$

$$I_{an} = \frac{S_n}{3 \cdot U_n} = \frac{60000}{3 \cdot 220} = 90,909 \text{ A}$$

$$c) M_n = \frac{P}{\omega_0} = \frac{48000}{157,079} = 305,57 \text{ N} \cdot \text{m}$$

d)



$$e) U_p = \sqrt{(U_k + I_a \cdot X_d \cdot \sin \varphi)^2 + (I_a \cdot X_d \cdot \cos \varphi)^2} =$$

$$= \sqrt{(220 + 90,909 \cdot 4 \cdot 0,6)^2 + (90,909 \cdot 4 \cdot 0,8)^2} = 525,95 \text{ V}$$

$$f) \sin \delta = \frac{I_a \cdot X_d \cdot \cos \varphi}{U_p} = \frac{90,909 \cdot 4 \cdot 0,8}{525,95} = 0,553 \rightarrow \delta = 33,58^\circ$$

$$U_p = 525,95 \text{ V}$$

$$\delta = 33,58^\circ$$