c) A nyomaték:

$$M = \frac{P_n \cdot 60}{2 \cdot \pi \cdot n} = \frac{200 \cdot 10^3 \cdot 60}{2 \cdot \pi \cdot 980} = 1949 \text{ N} \cdot \text{m}$$

$M = 1949$ N·m

d) A légrésteljesítmény és az állórészveszteség:

$$P_\delta = M \cdot \frac{2 \cdot \pi \cdot n_0}{60} = 1949 \cdot \frac{2 \cdot \pi \cdot 1000}{60} = 204{,}1 \text{ kW}$$

$P_\delta = 204{,}1$ kW

$$P_{w1} = P_1 - P_\delta = 220 - 204{,}1 = 15{,}9 \text{ kW}$$

$P_{w1} = 15{,}9$ kW

e) A vasveszteség:

$$P_{t1} = 1{,}5 \cdot I_n^2 \cdot R_{K1} = 1{,}5 \cdot 149{,}4^2 \cdot 0{,}224 = 7500 \text{ W}$$

$$P_v = P_{w1} - P_{t1} = 15{,}9 - 7{,}5 = 8{,}4 \text{ kW}$$

$P_v = 8{,}4$ kW

f) A hatásfok:

$$\eta_1 = \frac{P_\delta}{P_1} = \frac{204{,}1}{220} = 0{,}927 = 92{,}7\ \%$$

$\eta_1 = 92{,}7\ \%$

5.1.29. feladat

a) $P_1 = P_{2n} + P_{2tn} + P_{sn} = 58 + 2{,}5 + 2 = 62{,}5$ kW

$$P_{t2} = s \cdot P_1 \quad \rightarrow \quad s = \frac{P_{t2}}{P_1} = \frac{2{,}5}{62{,}5} = 0{,}04 = 4\ \%$$

$s = 4\ \%$

$$n_0 = \frac{60 \cdot f}{p} = \frac{60 \cdot 50}{2} = 1500 \text{ 1/min} = 25 \text{ 1/s}$$

$n_0 = 25$ 1/s

$$\omega_0 = 2 \cdot \pi \cdot n_0 = 2 \cdot \pi \cdot 25 = 157{,}08 \text{ 1/s}$$

$\omega_0 = 157{,}08$ 1/s

b) $n = (1 - s) \cdot n_0 = (1 - 0{,}04) \cdot 25 = 24$ 1/s $= 1440$ 1/min

$n = 1440$ 1/min

$$\omega = 2 \cdot \pi \cdot n = 2 \cdot \pi \cdot 24 = 150{,}8 \text{ 1/s}$$

$\omega = 150{,}8$ 1/s

c) $$P_{1n} = \frac{P_{2n}}{\eta} = \frac{58}{0{,}86} = 67{,}442 \text{ kW}$$

$$I_{1n} = \frac{P_{1n}}{\sqrt{3} \cdot U \cdot \cos\varphi} = \frac{67{,}442 \cdot 10^3}{\sqrt{3} \cdot 380 \cdot 0{,}702} = 145{,}965 \text{ A}$$

$I_{1n} = 145{,}965$ A

d) $$Z_n = \frac{U_{1f}}{I_{1n}} = \frac{220}{145{,}965} = 1{,}507\ \Omega$$

$$R_1 + \frac{R_2'}{S_n} = Z_n \cdot \cos\varphi = 1{,}507 \cdot 0{,}702 = 1{,}058\ \Omega$$