

3. EGYENÁRAMÚ GÉPEK

3.1. Egyenáramú motorok

$$I = \frac{P_1}{U_k} = \frac{14705}{220} = 66,8 \text{ A}$$

$$I_a' = I - I_g = 66,8 - 6,8 = 60 \text{ A}$$

$$U_i' = U_k - I_a' \cdot R_b = 220 - 60 \cdot 0,155 = 210,7 \text{ V}$$

$$n = \frac{U_i'}{U_i} \cdot n_n = \frac{210,7}{200,3} \cdot 1500 = 1578 \text{ 1/min}$$

$$n = 1578 \text{ 1/min}$$

$$\text{a) } I_{an} = \frac{P_n}{\eta \cdot U_{kn}} = \frac{10 \cdot 10^3}{0,835 \cdot 500} = 23,952 \text{ A}$$

$$\text{b) } C_u \cdot \Phi = \frac{U_{kn} - I_{an} \cdot R_b}{n_n} = \frac{500 - 23,952 \cdot 0,98}{1000} = 0,4765 \text{ V} \cdot \text{min}$$

$$n_0 = \frac{U_{kn}}{C_u \cdot \Phi} = \frac{500}{0,4765} = 1049,25 \text{ 1/min} = 17,48 \text{ 1/s}$$

$$\omega_0 = 2 \cdot \pi \cdot n_0 = 2 \cdot \pi \cdot 17,48 = 109,878 \text{ 1/s}$$

$$\text{c) } M_n = C_{Mn} \cdot \Phi \cdot I_{an} = \frac{60}{2 \cdot \pi} \cdot C_u \cdot \Phi \cdot I_{an} =$$

$$= \frac{60}{2 \cdot \pi} \cdot 0,476 \cdot 23,952 = 108,99 \text{ N} \cdot \text{m}$$

$$\text{d) } n = \frac{U_{kn} - I_{an} \cdot (R_a + R_b)}{C_u \cdot \Phi}$$

$$R = \frac{U_{kn} - C_u \cdot \Phi \cdot n}{I_{an}} = \frac{500 - 0,4765 \cdot 500}{23,952} = 0,98 = 9,947 \text{ } \Omega$$

$$R = 9,947 \text{ } \Omega$$

$$\text{e) } P_v = I_{an}^2 \cdot R = 23,952^2 \cdot 9,947 = 5706,9 \text{ W}$$

$$P_v = 5706,9 \text{ W}$$

$$\text{a) } \omega_0 = \frac{U_{kn}}{K \cdot \Phi} \rightarrow K \cdot \Phi = \frac{U_{kn}}{\omega_0} = \frac{220}{2 \cdot \pi \cdot 25} = 1,4 \text{ V} \cdot \text{s}$$

$$M_n = K \cdot \Phi \cdot I_{an} = 1,4 \cdot 20 = 28 \text{ N} \cdot \text{m}$$

$$\omega = \frac{U_{kn} - I_{an} \cdot R_b}{K \cdot \Phi} = \frac{220 - 20 \cdot 1,2}{1,4} = 139,94 \text{ 1/s}$$

3.1.19. feladat

$$M_n = 28 \text{ N} \cdot \text{m}$$

$$\omega = 139,94 \text{ 1/s}$$