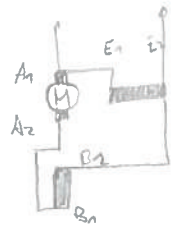
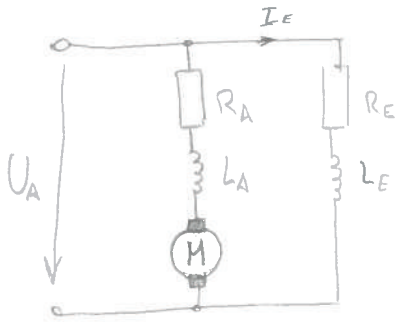
(21) Nebenschluss – Gleichstrommaschine

$U_i = f(I_E)$ bei $n = 1000\ U/min$

$I_{AN} = 200A$, $U_{AN} = 40V$, $n_N = 2000\ U/min$

1.)





2.) ges.: $k_1\Phi_N$, M_N , P_N $\quad R_E = 2{,}5\Omega$

$$I_E = \frac{U_{AN}}{R_E} = 16A \qquad I_{ALL} = 0\ !$$

$$\Downarrow$$

$$U_i = 19{,}5V \Rightarrow \underline{k_1'\phi = \frac{U_i}{\Omega_m} = \frac{19{,}5V}{1000\frac{U}{min}\,2\pi\,60} = 0{,}186\,Vs}$$

$$\underline{M_N = I_{AN} k_1'\phi = 37{,}24\,Nm}$$

$$\underline{P_N = I_{AN} \cdot U_{AN} = 8kW}$$

3.) ges.: n_0, R_A

$$U_{AN} = k_1'\phi \cdot \Omega_0 \Rightarrow \underline{n_0 = \frac{U_{AN}}{k_1'\phi} \cdot \frac{60}{2\pi} = 2051{,}3\frac{U}{min}}$$

$$U_A = I_A R_A + k_1'\phi\,\Omega_N \Rightarrow \underline{R_A = \frac{U_A - k_1'\phi\,\frac{2000\frac{U}{min}\cdot 2\pi}{60}}{I_A} = 5m\Omega}$$

4.) ges.: η_N $\quad R_E = 2{,}5\Omega$

$$\underline{\eta_N = \frac{P_{mech}}{P_{el}} = \frac{M\,\Omega_m}{U_{AN} I_{N1}} = \frac{M \cdot \frac{n_N \cdot 2\pi}{60}}{U_{AN} \cdot (I_E + I_{AN})} = 0{,}903}$$

5.) $n = 2000\frac{U}{min}$, $R_E = 2{,}5\Omega$, $R_L = 0{,}01 / 0{,}02 / 0{,}05\,\Omega$ | $\underline{0\Omega}$

ges.: I_L , I_E , Kennlinie $U_A = f(I_L)$

Generator