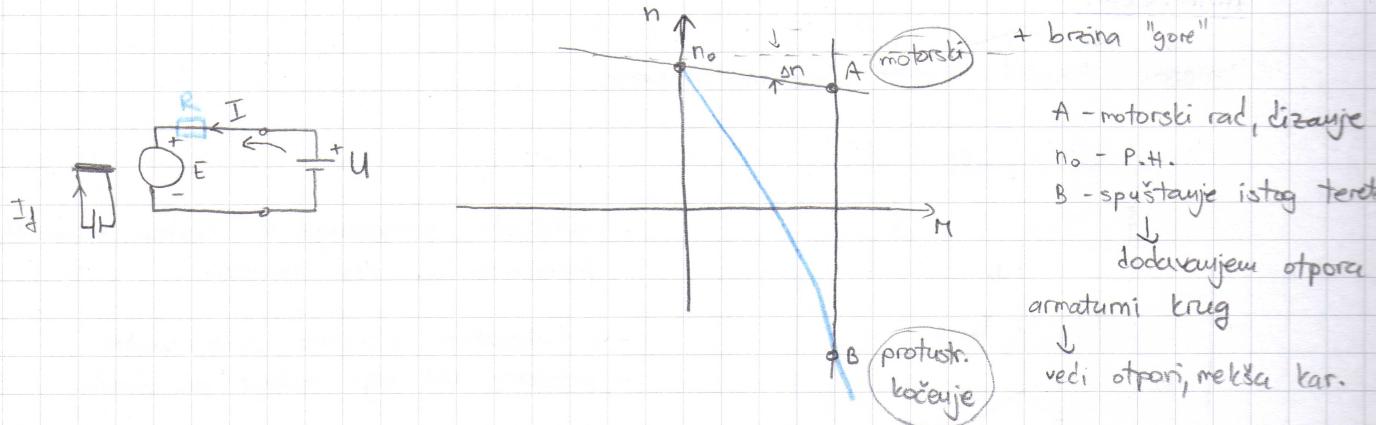
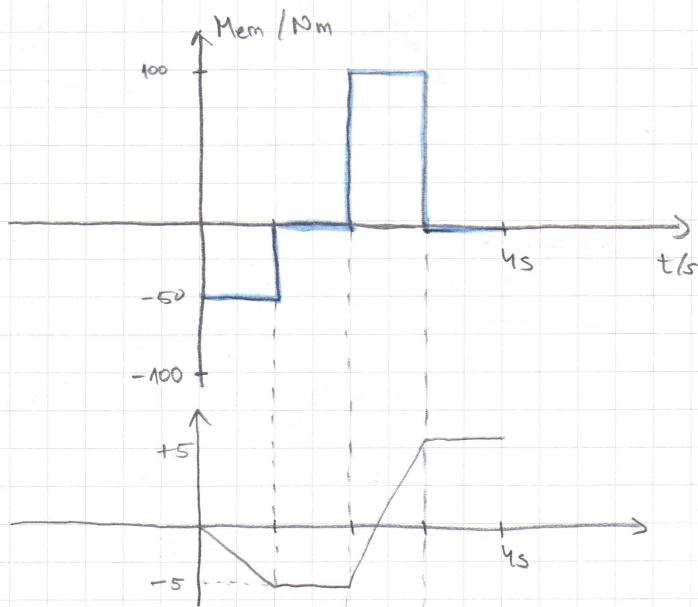


11. Skidajte momentnu kar. za rezavino uzbudjen motor

- opterećen razinim teretom i dizje kabinu
- koji uz isti iznos brzine spušta kabinu istog tereta kao a)
- o kojim se režimima rečeti radi pod a i b?



12. Ukupni  $J_{trom.} = 10 \text{ kgm}^2$ . Ne opterećen na osovini. Izračunaj  $\Delta\omega$  i grafički prikaži za  $t=0$  do  $t=4 \text{ s}$



→ zadatak  $M$  karakteristika

$$F = ma \quad \rightarrow \text{neut. tereta, pa je } F = 0 \\ Mu = \int \frac{dw}{dt} dt \quad M_{mem} = M_{teret} \\ M_{teret} = M_{mem} + Mu$$

$$Mu = M_{teret} t + M_0$$

$$\omega = \frac{1}{J} \int_0^t M_{mem} dt + \text{poč. st.}$$

$$\omega = \frac{1}{10} \int_0^1 -50 dt = -5 \text{ rad/s}$$

$$\omega = \frac{1}{10} \int_1^3 100 dt - 5 = 5 \text{ rad/s}$$

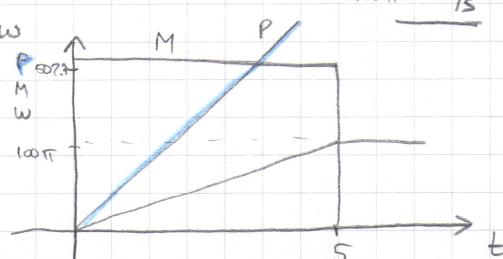
3. Ukupni moment trenosti  $T_M$  pogona preračunat na osovinu motora je  $J = 8 \text{ kgm}^2$ . Treba biti pristupa koja ravnaku trenost treba ubrzati konst. akceleracijom do  $n = 3000 \text{ der. min}$  u vremenu 5s. Neut. momenta tereta! Sticiraj!

$$M = J \left( \frac{dw}{dt} \right) \text{ konst.}$$

$$n = 3000 \cdot 2\pi = 6000\pi \text{ /min} \\ = 100\pi \text{ rad/s}$$

$$M = 8 \cdot \frac{3000\pi}{5} = 502,7 \text{ Nm}$$

$$P = M \cdot w$$



$$P = 158 \text{ kW} \times$$

$$\text{Nm} \cdot \frac{\text{rad}}{\text{s}}$$

$$\text{kg} \frac{\text{m}}{\text{s}^2} \cdot \frac{\text{m}}{\text{s}} \cdot \text{rad}$$

$$\text{kg} \frac{\text{m}^2}{\text{s}^2} \text{ rad}$$

14. Motor koji razvija konst.  $P = 10 \text{ kW}$  ubrzava zavojnjak,  $J = 2 \text{ kg m}^2$ , od brzine  $1000 \text{ min}^{-1}$  do  $2000 \text{ min}^{-1}$ . Koliko traje taka vo ubrzavanje?

$$M = \frac{d\omega}{dt} \cdot J \quad P = M \cdot \omega \quad \left. \begin{array}{l} \omega_1 = 1000 \cdot \frac{\pi}{30} \\ \omega_2 = 2000 \cdot \frac{\pi}{30} \end{array} \right\} \omega_2^2 - \omega_1^2 =$$

$$1' \quad \frac{\int \omega_2^2}{2} - \frac{\int \omega_1^2}{2} \rightarrow \boxed{\Delta E_k = E_{k2} - E_{k1} = Pt}$$

$$t = \frac{\Delta E}{P} = \frac{\frac{J}{2} (\omega_2^2 - \omega_1^2)}{P} = \underline{\underline{3,295}}$$

2"

$$\frac{P}{\omega} = J \frac{d\omega}{dt} \quad \omega = \frac{n\pi}{30} \rightarrow d\omega = \frac{\pi}{30} dn$$

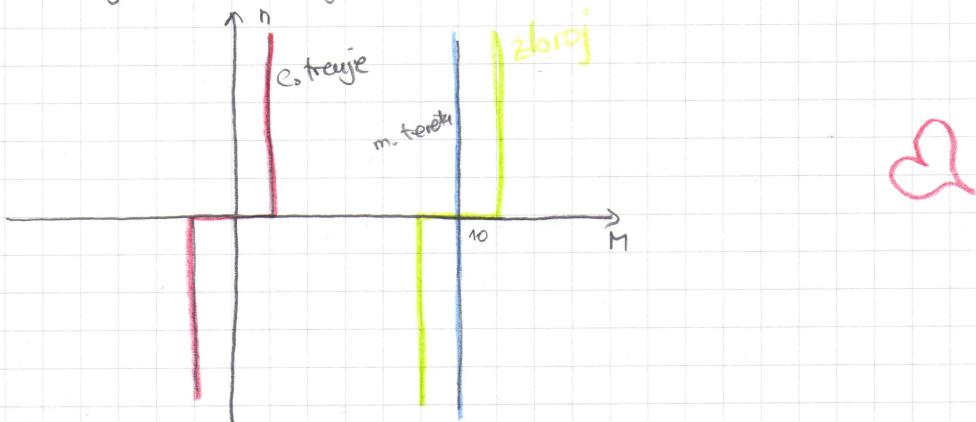
$$P dt = J \omega d\omega$$

$$P dt = J \cdot \left(\frac{\pi}{30}\right)^2 \cdot n dn / \int_{n_1}^{n_2}$$

$$P t = J \left(\frac{\pi}{30}\right)^2 \frac{n^2}{2} \Big|_{n_1}^{n_2} \Rightarrow t = \frac{1}{P} \cdot \left(\frac{\pi}{30}\right)^2 \cdot \frac{1}{2} \cdot (n_2^2 - n_1^2) = 3,295$$

15.

Moment tereta na dizalici je  $10 \text{ Nm}$ , a moment Coulonovog trenja je  $2 \text{ Nm}$ . Odredi i skiciraj ukupni moment opteređenja dizalice pri dizanju i spuštanju.

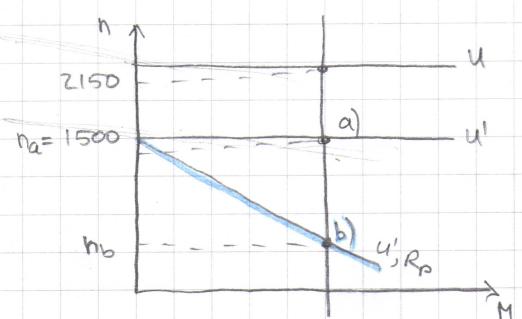


16.

NUL motor s konst. uzbudom i zavojnjikom nečekijom armature, nazivim po podatcima  $440 \text{ V}$ ,  $50 \text{ A}$ ,  $2150 \text{ min}^{-1}$ ,  $R_a = 0.2$ , radi opteređen konst. nazivim momentom.  $U' = ?$ ,  $n_b = ?$ , skiciraj  $n = f(M)$  za) a) i b) i označi stat. radne to-

a)  $U'$   $1500 \text{ min}^{-1}$

b)  $U'$   $R_p = 2 \Omega$



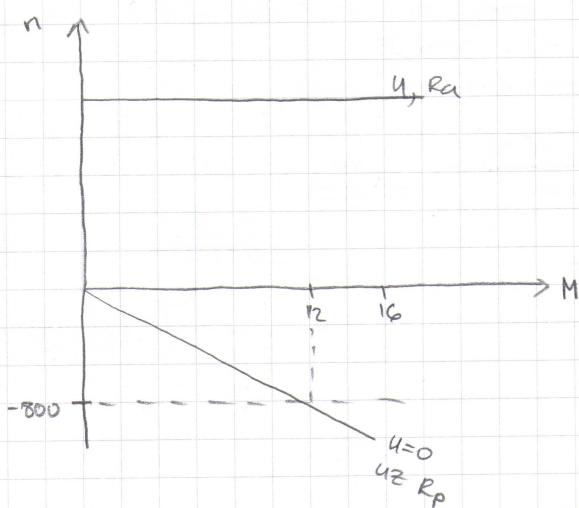
$$C_e = \text{konst. ind. napona} = \frac{U - I_a R_a}{n} = \frac{440 - 0.2 \cdot 50}{2150} = \underline{\underline{0.2}}$$

$$n_a = \frac{U' - I_a R_a}{C_e} \Rightarrow U' = n_a \cdot C_e + I_a R_a = \underline{\underline{310 \text{ V}}}$$

$$n_b = \frac{310 - I_b R_p + R_p}{C_e} = \underline{\underline{1000 \text{ min}^{-1}}}$$

[7] Istosmj. motor s permanentnim magnetom, 220 V, 16 A,  $2200 \text{ min}^{-1}$ ,  $R_a = 0,3 \Omega$

specifični potencijalni teret el.dinamičkom vrtnjom  $n_{sp} = 800 \text{ min}^{-1}$ , uz  $I_a = 12 \text{ A}$ .



$$c_e = \frac{U - I_a R_a}{n} = \frac{200 - 0,3 \cdot 16}{2200} = 0,08873$$

$$n_{sp} = \frac{-I_a (R_a + R_p)}{c_e} = \frac{-12 (0,3 + R_p)}{0,08873}$$

$$R_p = \frac{n_{sp} - c_e}{-I_a} - R_a = \underline{\underline{5,615 \Omega}}$$

Zašto se ne smije pokrećati uz puni napon armature? velika struja

