

TRANSPORTNI UREĐAJI

VJEŽBE - 02

asistent: Matija Hoić, mag. ing. mech.

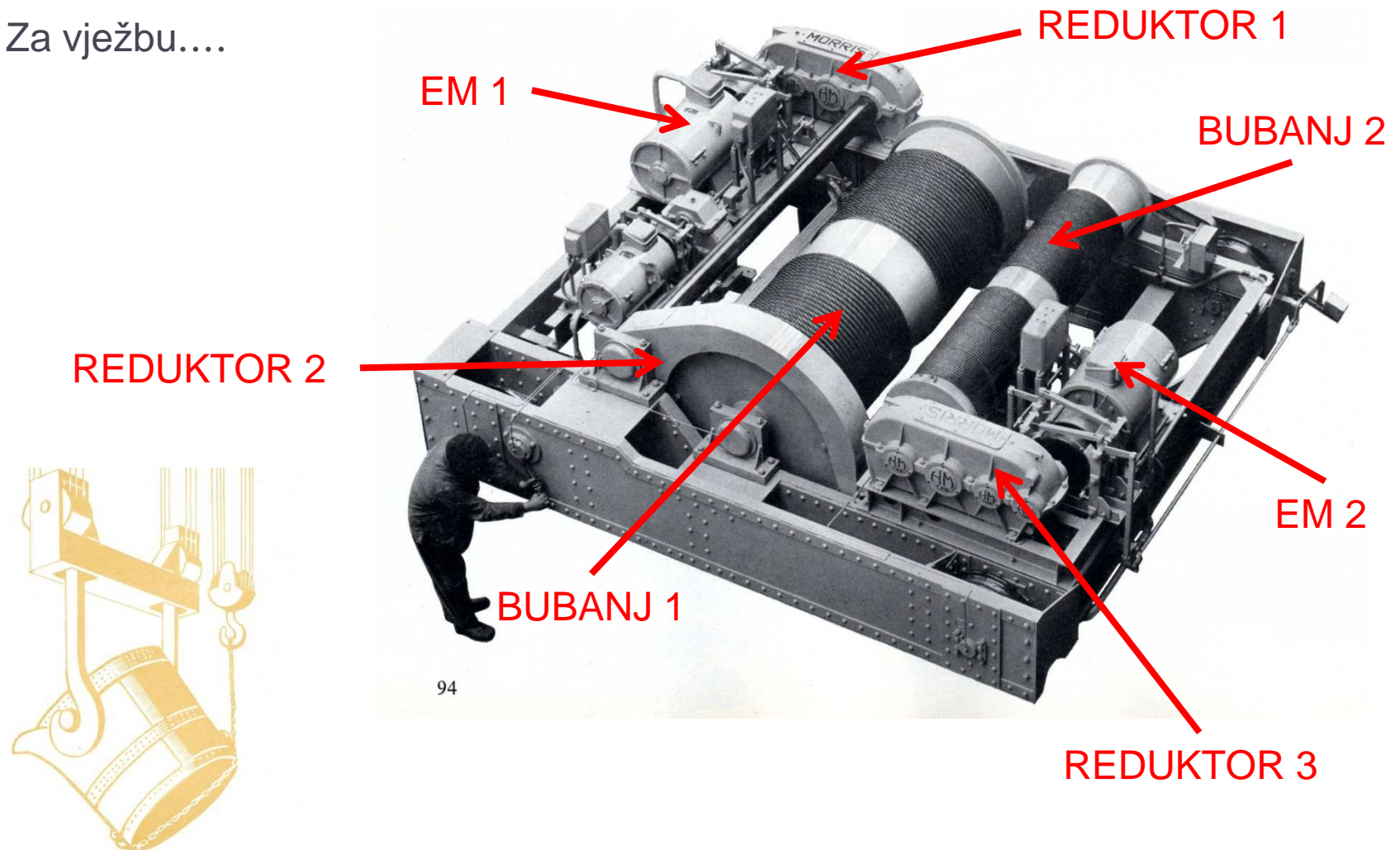
INFORMACIJE (1)

- OSNOVE TRANSPORTNIH UREĐAJA
 - 1. kolokvij – isti kao i za TU
 - 2. kolokvij – dio preostalih predavanja – moguće ga održati prije kraja semestra – prema dogovoru
 - Usmeni – moguće pristupiti prije kraja semestra – upis ocjene u nekom od rokova u lipnju
- UVJETI POLAGANJA TRANSPORTNIH UREĐAJA
 - Svi studenti koji u ovom trenutku nemaju odslušane Elemente konstrukcija III (tj. odgovarajući kolegij ovisno o smjeru), neće moći polagati Transportne uređaje, te se upućuju da ih ispišu.
 - Ukoliko je student odslušao, ali nije položio EK 3, mora položiti navedeni kolegij prije pristupanja ispitu iz TU.
 - Moguće je pristupiti kolokvijima te predati programski zadatak prije polaganja EK 3.

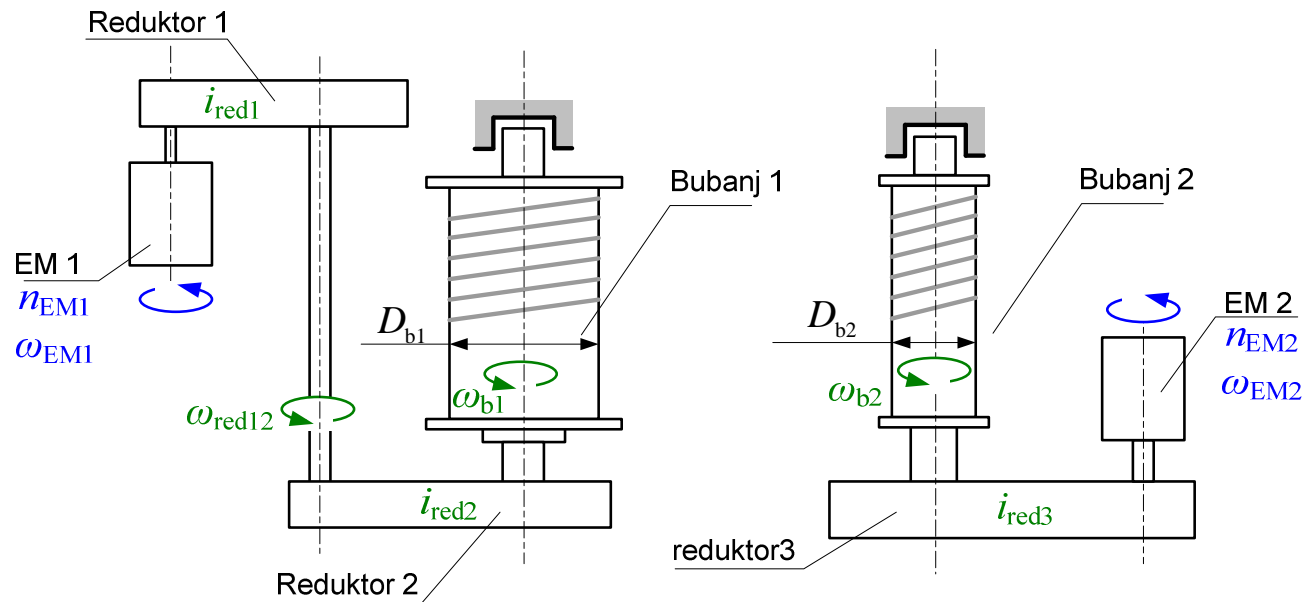


ZADATAK 3 (7) – sa vježbi 01

Za vježbu....



ZADATAK 3 (7) – sa vježbi 01



$$i_{uk1} = \frac{\omega_{EM1}}{v_{Q1}} = \frac{i_{red1} \cdot i_{red2} \cdot i_{k1}}{D_{b1}/2}$$

$$i_{uk2} = \frac{\omega_{EM2}}{v_{Q2}} = \frac{i_{red3} \cdot i_{k2}}{D_{b2}/2}$$

NAPOMENA:

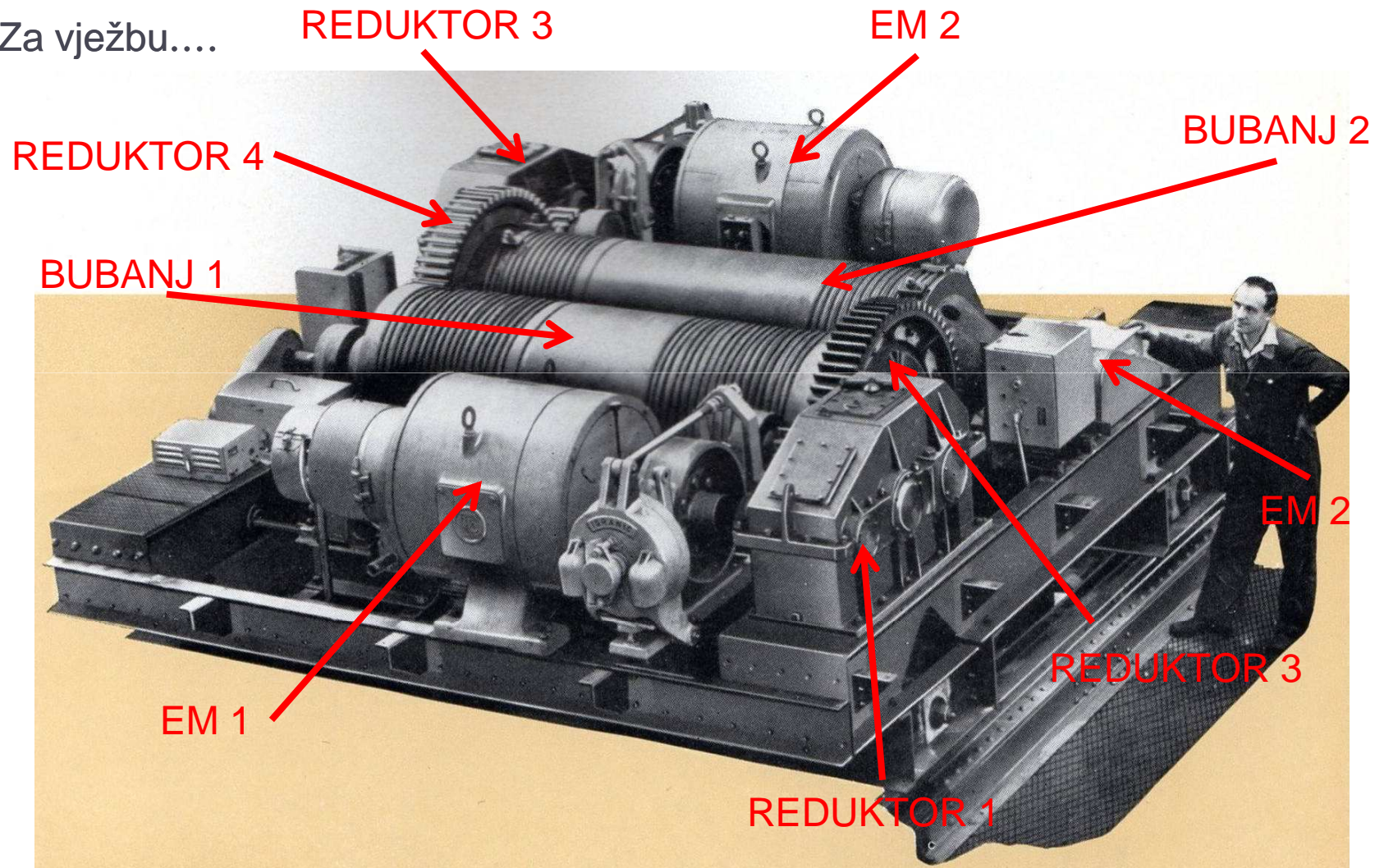
Sustavi nisu međusobno povezani!

Na skici nisu nacrtani koloturnici!

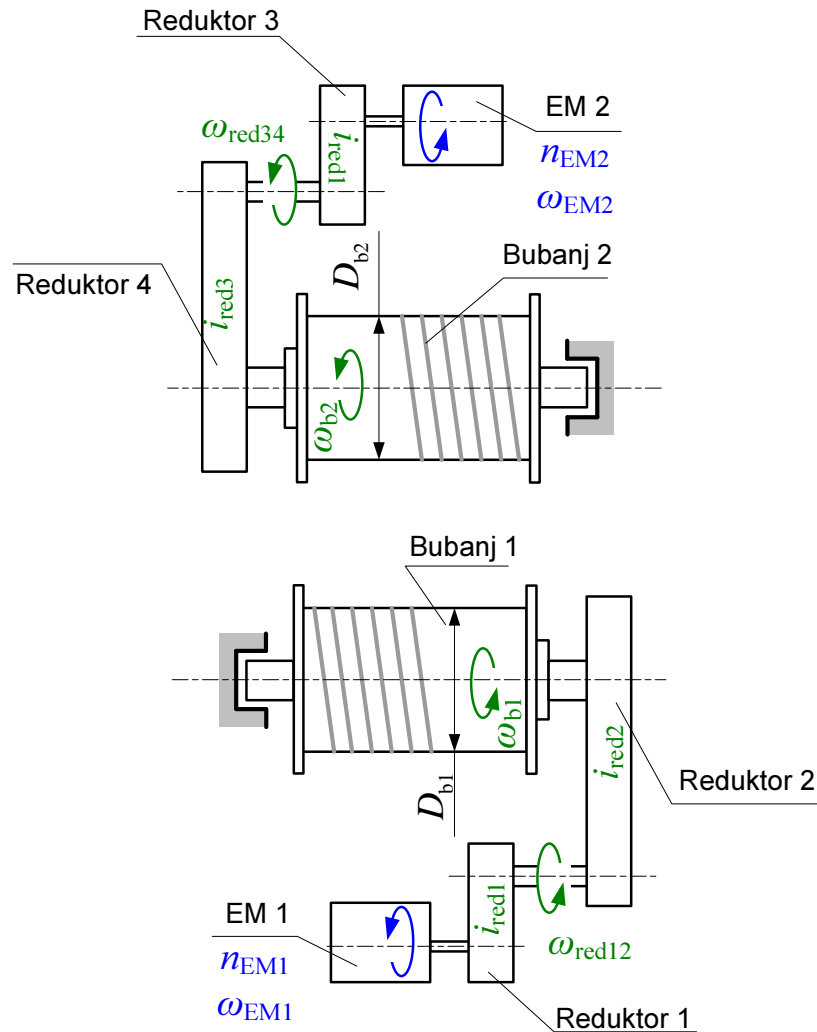


ZADATAK 3 (8) – sa vježbi 01

Za vježbu....



ZADATAK 3 (9) – sa vježbi 01



$$i_{uk1} = \frac{\omega_{EM1}}{v_{Q1}} = \frac{i_{red1} \cdot i_{red2} \cdot i_k}{D_{b1}/2}$$

$$i_{uk2} = \frac{\omega_{EM2}}{v_{Q2}} = \frac{i_{red3} \cdot i_{red4} \cdot i_{k2}}{D_{b2}/2}$$

NAPOMENA:

Sustavi nisu međusobno povezani!

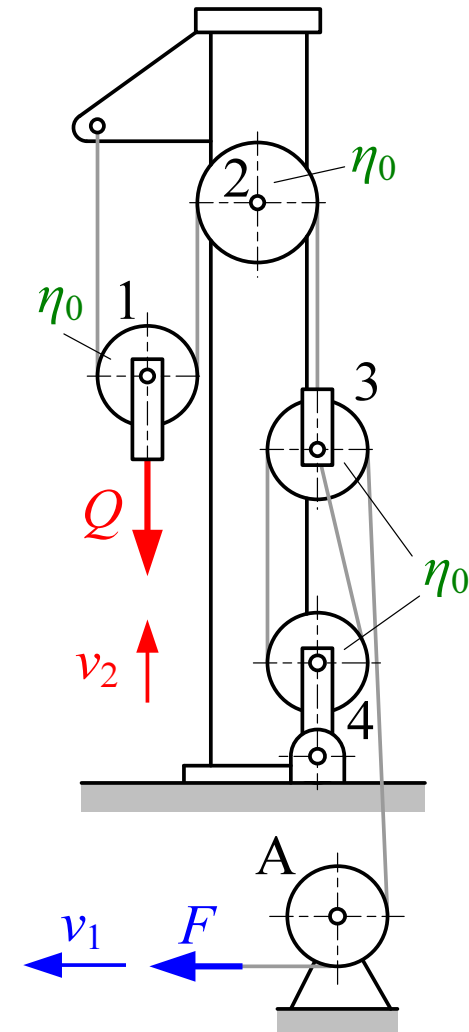
Na skici nisu nacrtani koloturnici!

ZADATAK 4 (1)

Koloturnik za dizanje tereta prema slici ima pojedinačnu iskoristivost svake užnice $\eta_0 = 0,98$ (valjni ležajevi).

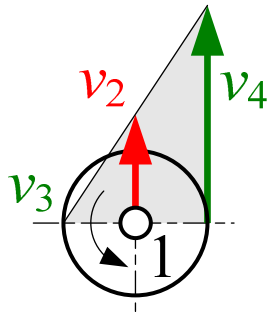
Izračunati:

- prijenosni odnos koloturnika ;
- odnos F/Q pri jednolikom dizanju i spužtanju tereta – vježbe 03
- rezultirajuću silu na osovini užnice A – vježbe 03 .



ZADATAK 4 (2)

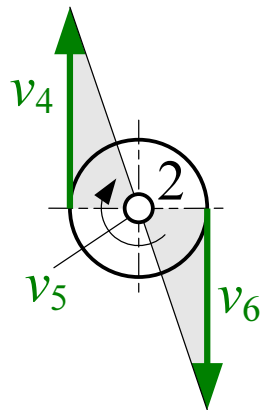
UŽNICA 1



$$v_2 = \frac{v_3 + v_4}{2}$$

$$v_3 = 0 \quad \Rightarrow \quad v_4 = 2 \cdot v_2 \quad (1)$$

UŽNICA 2



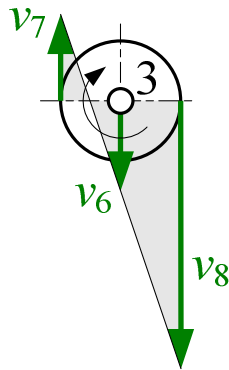
$$v_5 = \frac{v_4 - v_6}{2}$$

$$v_5 = 0 \quad \text{i (1)} \quad \Rightarrow \quad v_4 = v_6 = 2 \cdot v_2 \quad (2)$$



ZADATAK 4 (3)

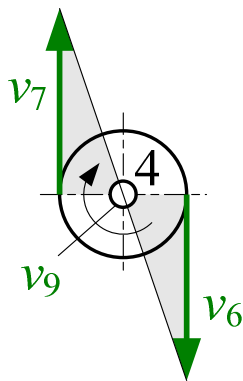
UŽNICA 3



$$v_6 = \frac{v_8 - v_7}{2} \Rightarrow v_8 - v_7 = 2 \cdot v_6 \quad (3)$$

$$(2) \text{ i } (3) \Rightarrow v_8 - v_7 = 4 \cdot v_2 \quad (4)$$

UŽNICA 4



$$v_9 = \frac{v_7 - v_6}{2}$$

$$v_9 = 0 \Rightarrow v_7 = v_6 \quad (5)$$

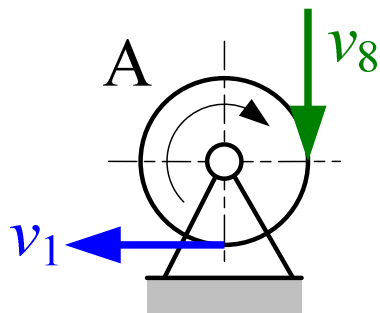
$$(5) \text{ i } (3) \Rightarrow v_7 = v_6 = 2 \cdot v_2 \quad (6)$$



ZADATAK 4 (4)

$$(6) \text{ i } (4) \Rightarrow v_8 = 6 \cdot v_2 \quad (7)$$

SKRETNA UŽNICA A



$$v_8 = v_1 \quad (8)$$

$$(8) \text{ i } (7) \Rightarrow v_1 = 6 \cdot v_2$$

Traženi prijenosni odnos iznosi: $i_{\text{kol}} = \frac{v_1}{v_2} = 6$



ZADATAK 4 (5)

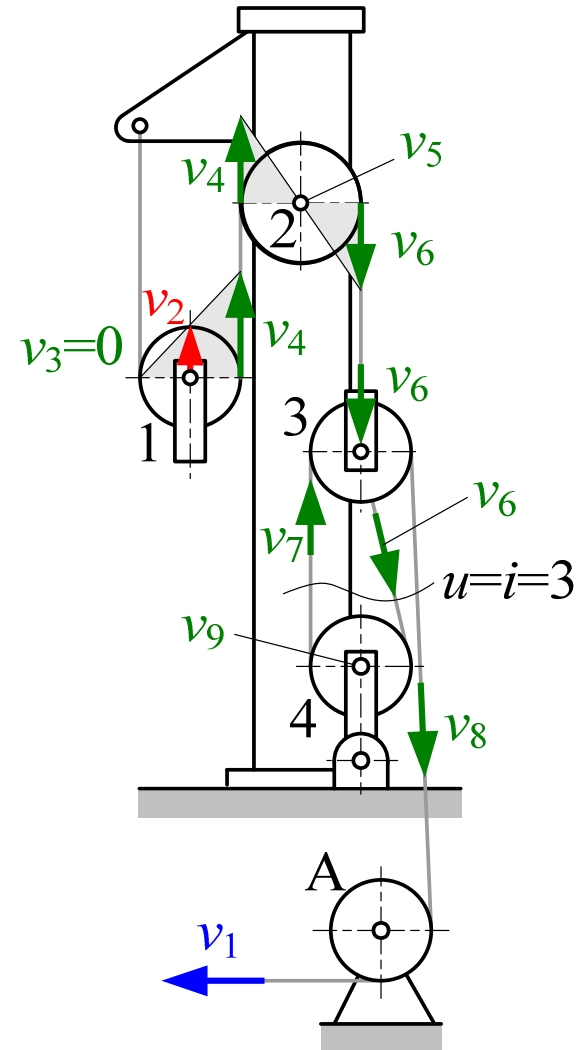
SKRAĆENI POSTUPAK

$$v_4 = 2 \cdot v_2$$

$$\frac{v_8}{v_4} = i = 3 \Rightarrow v_8 = 3 \cdot v_4 \Rightarrow v_8 = 6 \cdot v_2$$

$$v_1 = v_8 = 6 \cdot v_2$$

$$i_{\text{kol}} = \frac{v_1}{v_2} = 6$$

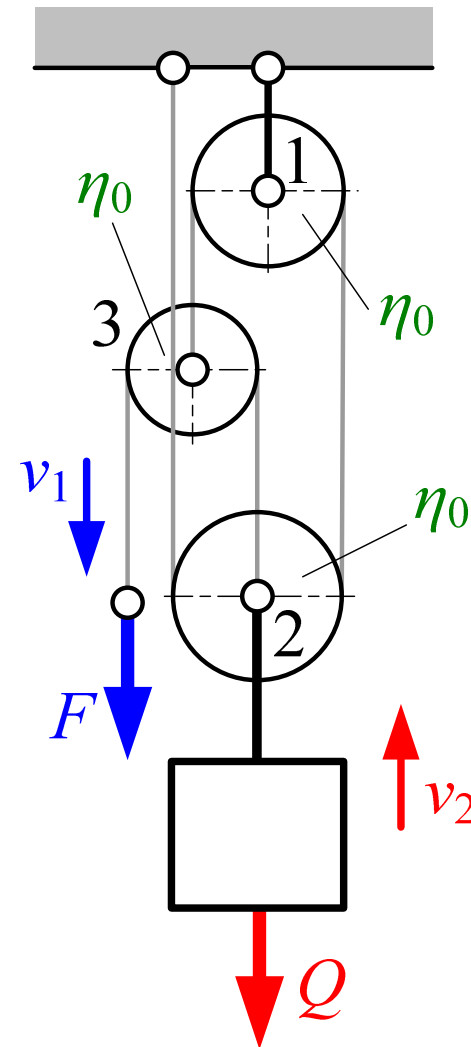


ZADATAK 6 (1)

Za koloturnik prema slici odrediti

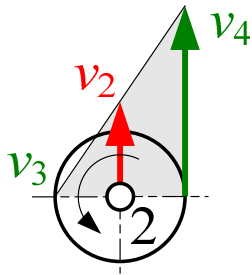
- prijenosni odnos v_1/v_2
- stupanj iskoristivosti pri dizanju i spuštanju tereta
- veličinu sile F pri jednolikom dizanju i jednolikom spuštanju tereta.

Pojedinačni stupanj iskoristivosti užnica je $\eta_0 = 0,98$ (valjni ležajevi).



ZADATAK 6 (2)

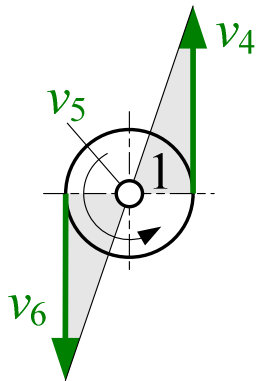
UŽNICA 2



$$v_2 = \frac{v_3 + v_4}{2}$$

$$\text{Uz } v_3 = 0 \Rightarrow v_4 = 2v_2$$

UŽNICA 1



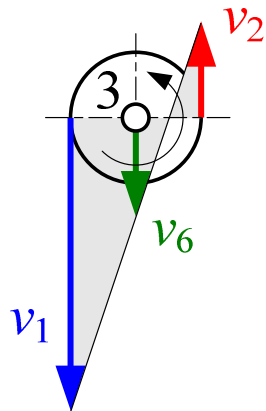
$$v_5 = \frac{v_4 + v_6}{2}$$

$$\text{Uz } v_5 = 0 \Rightarrow v_6 = -v_4 = -2v_2$$



ZADATAK 6 (3)

UŽNICA 3



$$\frac{v_1 + v_2}{2} = v_6 = -2v_2$$

$$v_1 + v_2 = -4v_2 \quad \Rightarrow \quad v_1 = -5v_2$$

Traženi prijenosni odnos koloturnika stoga iznosi:

$$i_{\text{kol}} = \left| \frac{v_1}{v_2} \right| = 5$$



ZADATAK 6 (4)

SKRAĆENI POSTUPAK

$$v_4 = 2v_2 \quad (\text{užnica 2})$$

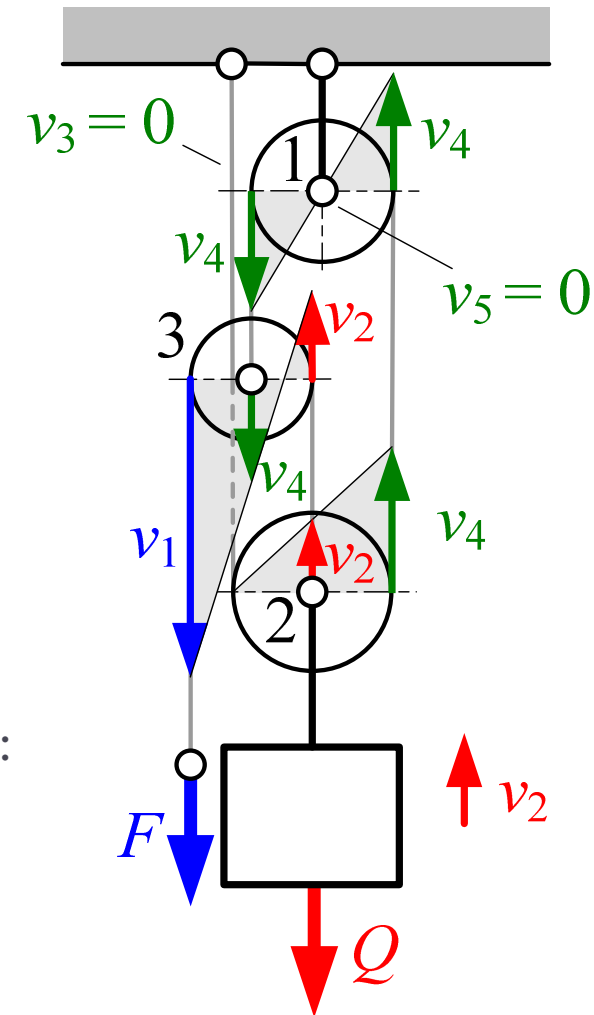
$$\frac{v_1 + v_2}{2} = -v_4 = -2v_2 \quad (\text{užnica 3})$$

$$v_1 + v_2 = -4v_2$$

$$v_1 = -5v_2$$

Traženi prijenosni odnos koloturnika stoga iznosi:

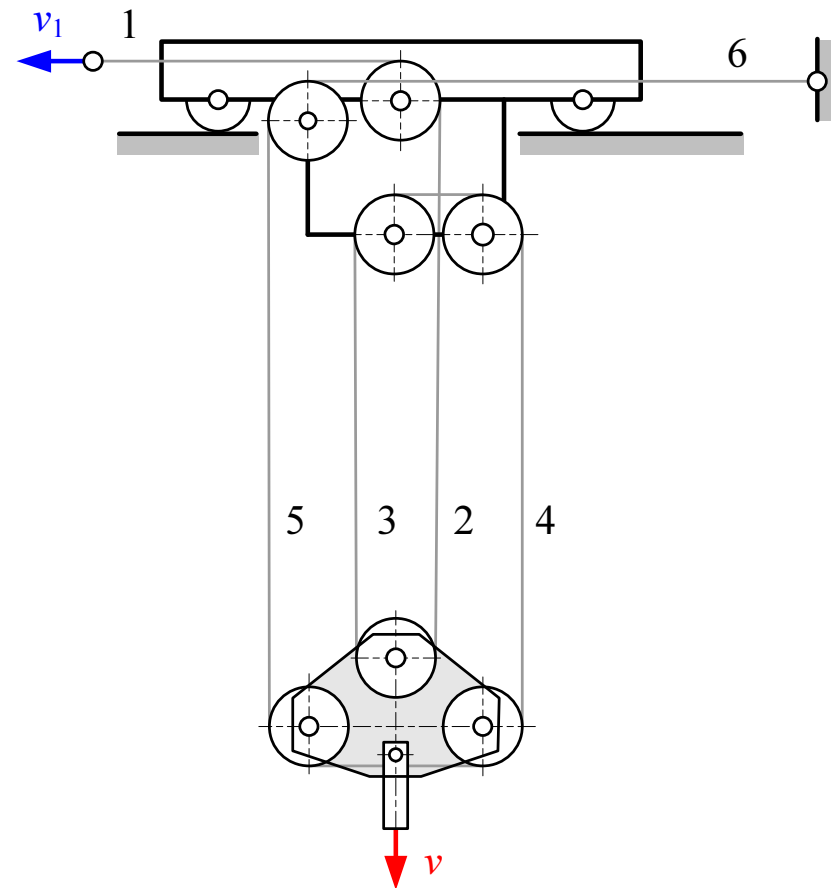
$$i_{\text{kol}} = \left| \frac{v_1}{v_2} \right| = 5$$



ZADATAK 7 (1)

Za vježbu....

Kotači su zakočeni. Potrebno je izračunati prijenosni omjer preko dijagrama brzina na užnicama



ZADATAK 8 (1)

Za vježbu....

Za ručni mehanizam dizanja prema slici poznato je:

$$v_1 = 1 \text{ m/s};$$

$$r = 0,35\text{m};$$

$$R = 0,15\text{m};$$

$$i_{\text{red}} = 6;$$

Odrediti brzinu dizanja tereta v_2

