

Z1 - 2013/2014

Zadatak 1.

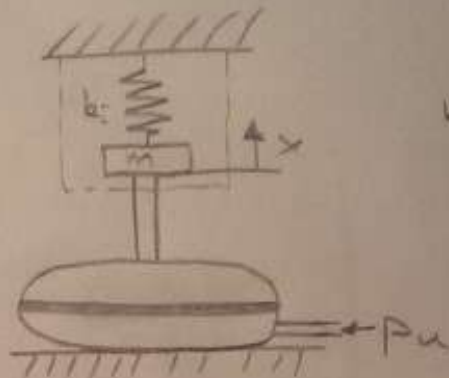
$$p_u = 5 \text{ bar}$$

$$k = 80 \frac{\text{N}}{\text{cm}}$$

$$\mu = 5 \frac{\text{Ns}}{\text{m}}$$

$$r = 0.01 \text{ m}$$

$$x = ?$$



$$m = 1 \text{ kg}$$

$$k_i = 20 \frac{\text{N}}{\text{cm}}$$

Sile koje se javljaju u motoru:

$F_k \downarrow$ - sila opruge

$F_m \downarrow$ - sila mase

$F_t \downarrow$ - sila trenja

$F_u \uparrow$ - sila ulaznog tlaka

$F_g \downarrow$ - sila teže

$$\sum F = 0$$

$$F_u - F_k - F_m - F_t - F_g = 0$$

$$F_m + F_t + F_k + F_g = F_u$$

$$m \frac{d^2 x(t)}{dt^2} + \mu \frac{dx(t)}{dt} + k x(t) = (\underbrace{r^2 \pi}_{=S}) p_u - mg - k_i x(t)$$

$$m s^2 X(s) + \mu s X(s) + (k + k_i) X(s) = S p_u - mg$$

$$X(s) = \frac{S p_u - mg}{m s^2 + \mu s + k + k_i}$$

$$X(s) = \frac{S p_u - mg}{m s^2 + \mu s + k + k_i}$$

$$x(\infty) = \lim_{s \rightarrow 0} X(s) = \lim_{s \rightarrow 0} \frac{S \cdot 5 \cdot 10^5 - 9.81}{s^2 + 5s + 80 + 20}$$

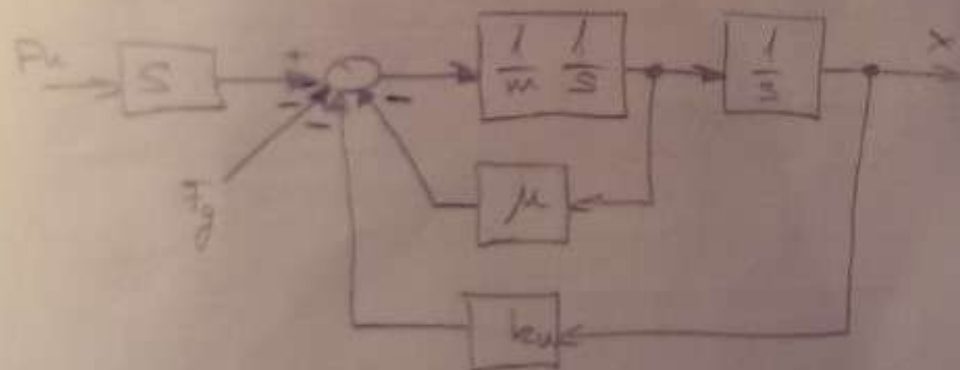
$$= \frac{(0 \text{ cm}^2 \cdot \text{s}) \cdot 5 \cdot 10^5 - 9.81}{80 + 20} = \underline{\underline{1.47 \text{ cm}}}$$

tržimo ustaljenú výhľadnosť

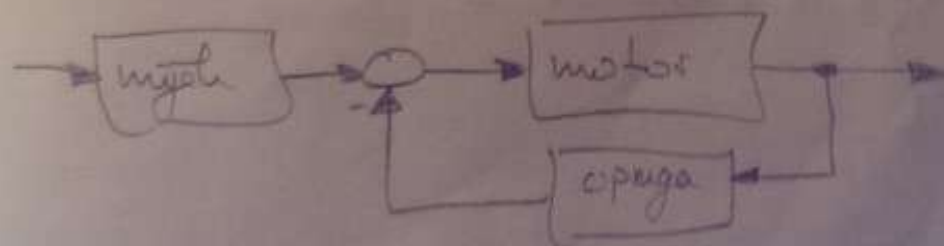
Blockovské schéma:

$$\frac{d^2 x(t)}{dt^2} = -\frac{\mu}{m} \frac{dx(t)}{dt} - \frac{k_u}{m} x(t) + S p_u - \frac{1}{m} F_g$$

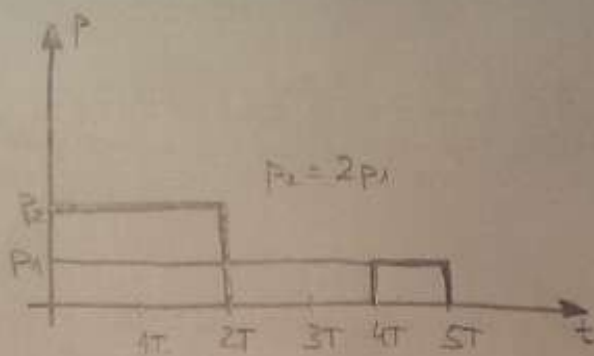
$k_u = k + k_v$



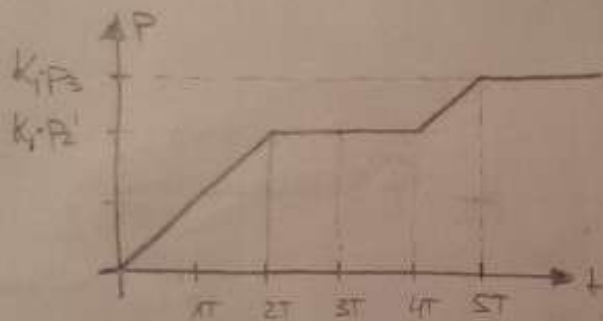
Funkčionalná schéma:



Zadatak 2.



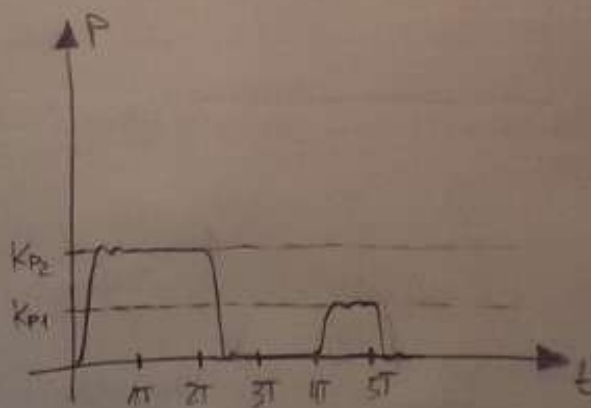
PM s I-povašanjem:



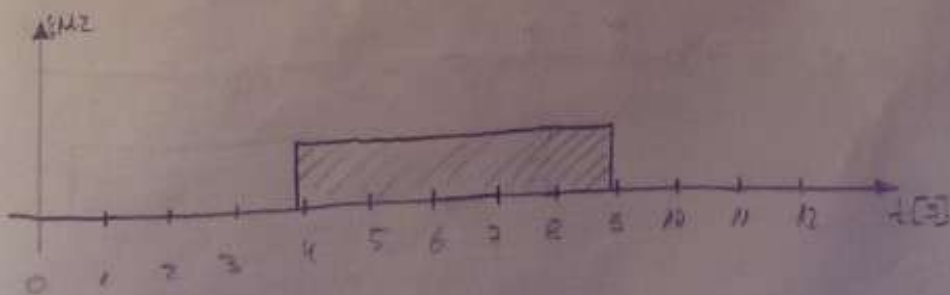
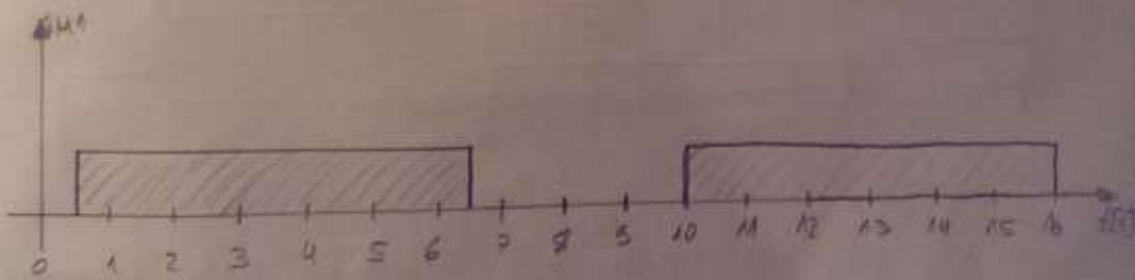
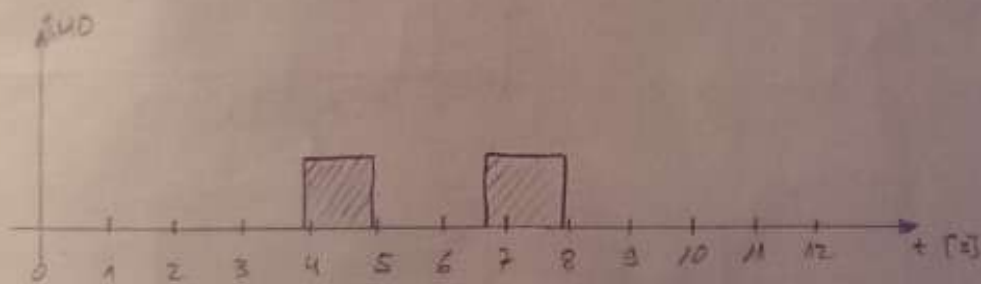
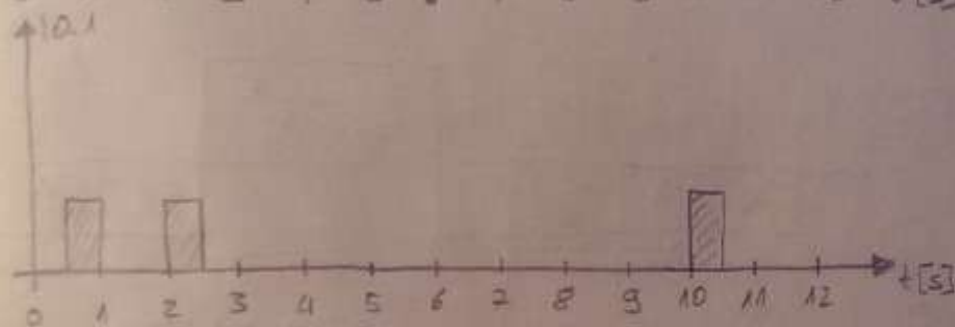
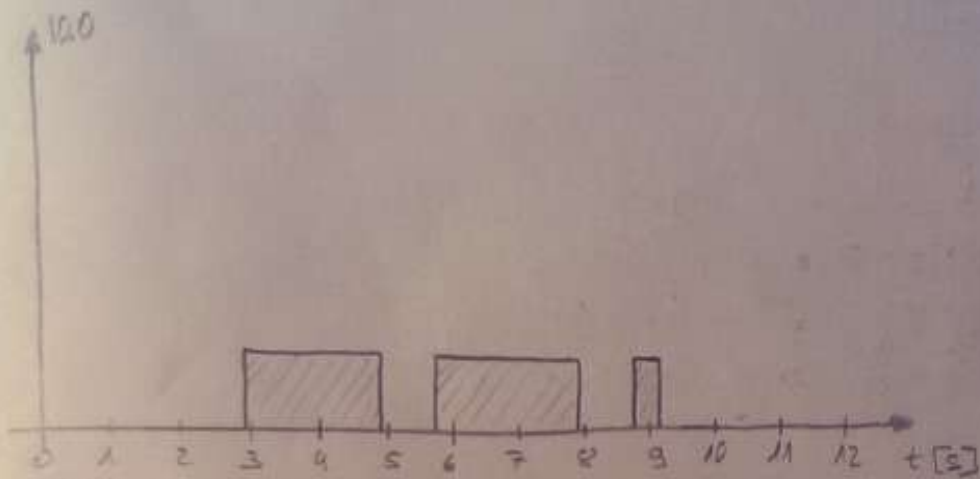
$$P_2' = \int_0^{2T} P_2 dt = 2T P_2$$

$$P_2 = \int_{4T}^{5T} P_1 dt = T P_1$$

PM s P-povašanjem:



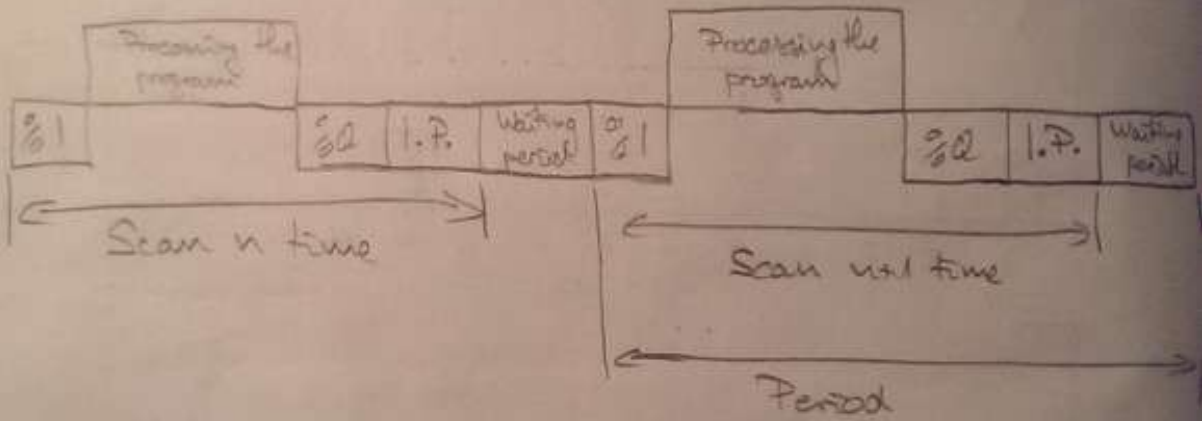
Zadatok 3.



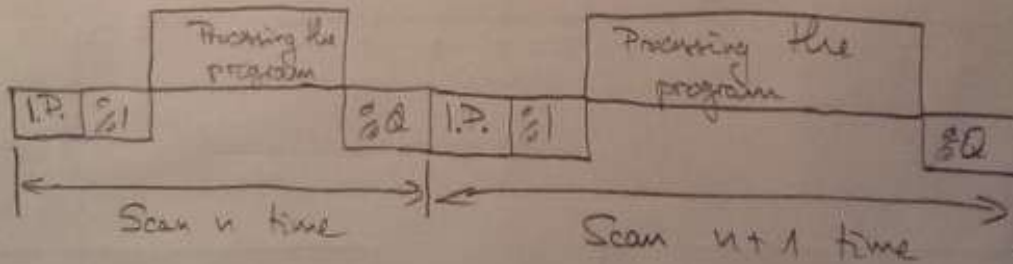
Zadatok 4.

PLC - scan

9)



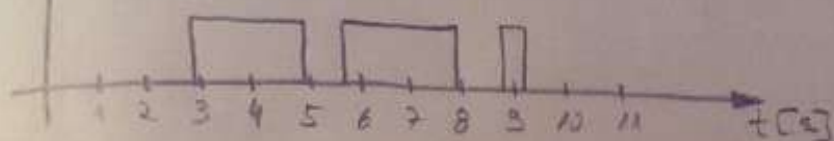
5



Tražanje usluga koji nije određen od strane korisnika ovisi o broju i vrsti instrukcija.

Zadatok 5.

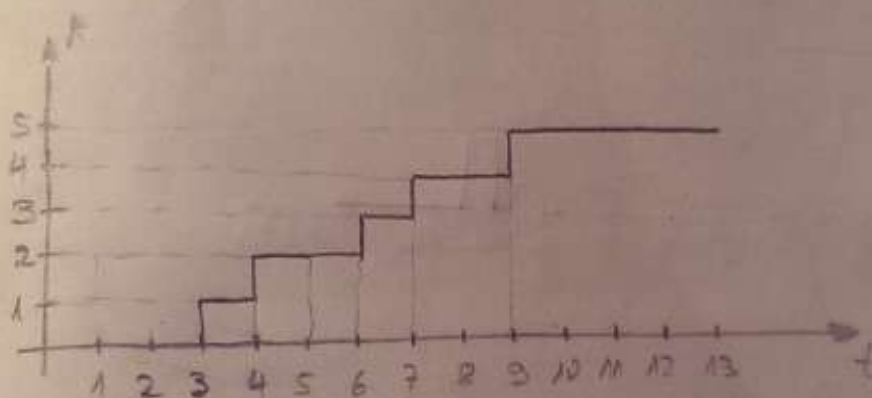
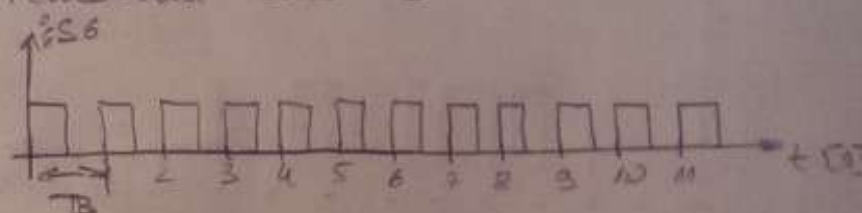
10.0



$S_6 = 1 \Rightarrow$ vremenovska baza $T_B = 1s$

$A = 0$

$S_{ND} = 0$



$A = 5$