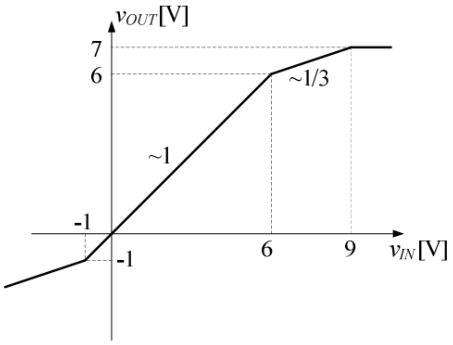
OSNOVI ANALOGNE ELEKTRONIKE – JUL 24 – REŠENJA

3. rešenje

$$v_{OUT}=\begin{cases}\dfrac{R_2}{R_1+R_2}v_{IN}-\dfrac{R_1}{R_1+R_2}V_D & v_{IN}\le -V_D\\ v_{IN} & -V_D\le v_{IN}\le V_Z\\ \dfrac{R_2}{R_1+R_2}v_{IN}+\dfrac{R_1}{R_1+R_2}V_Z & V_Z\le v_{IN}\le V_Z+3V_D\\ V_Z+V_D & v_{IN}\ge V_Z+3V_D\end{cases}=\begin{cases}0.33v_{IN}-0.67\ \text{V} & v_{IN}\le -1\ \text{V}\\ v_{IN} & -1\ \text{V}\le v_{IN}\le 6\ \text{V}\\ 0.33v_{IN}+4\ \text{V} & 6\ \text{V}\le v_{IN}\le 9\ \text{V}\\ 7\ \text{V} & v_{IN}\ge 9\ \text{V}\end{cases}$$

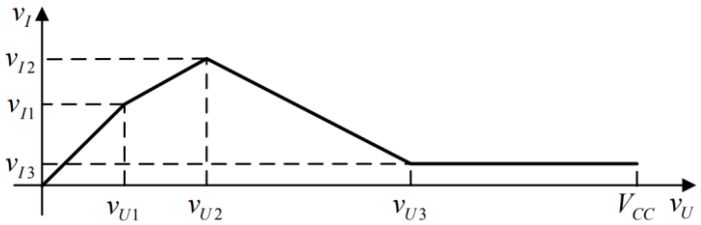


4. rešenje

Izrazi koji opisuju funkcije prenosa kola:

$$v_I=\begin{cases}v_U & 0\ \text{V}\le v_U\le 0.7\ \text{V}\\ \dfrac{v_U}{2}+0.35\ \text{V} & 0.7\ \text{V}\le v_U\le 1.4\ \text{V}\\ -\dfrac{v_U}{2}+1.75\ \text{V} & 1.4\ \text{V}\le v_U\le 3.1\ \text{V}\\ 0.2\ \text{V} & 3.1\ \text{V}\le v_U\le 5\ \text{V}\end{cases},$$

Grafički prikaz je dat:



gde je:

v_{I1} = v_{U1} =0.7 V

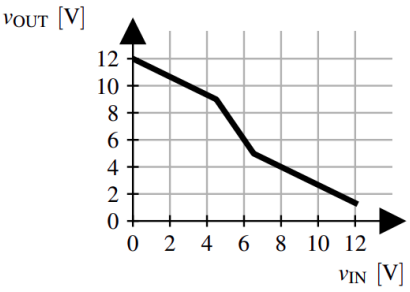
v_{U2} = 1.4 V , v_{I2} = 1.05 V.

v_{U3} = 3.1 V, v_{I3} = 0.2 V.

7. Resenje

(a)

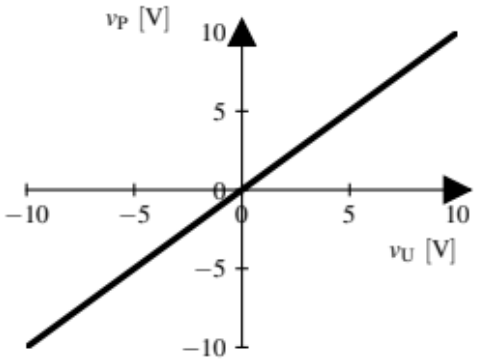
$$v_I = \begin{cases} -\frac{2}{3}v_{IN} + 12\,V & , \quad 0 \le v_{IN} \le 4{,}5\,V \\ -2v_{IN} + 18\,V & , \quad 4{,}5\,V \le v_{IN} \le 6{,}5\,V \\ -\frac{2}{3}v_{IN} + \frac{28}{3}\,V & , \quad 6{,}5\,V \le v_{IN} \le 12\,V \end{cases}$$

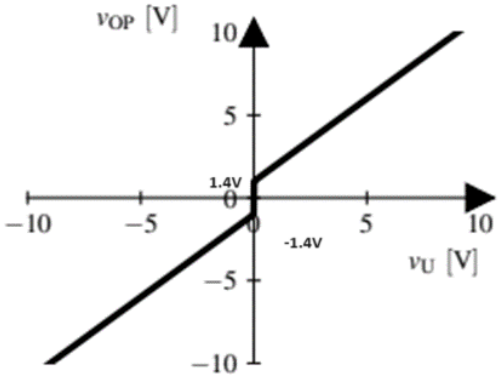


(б) $v_{OUT} = 7\,V - 0{,}2\,V \sin(\omega t)$.

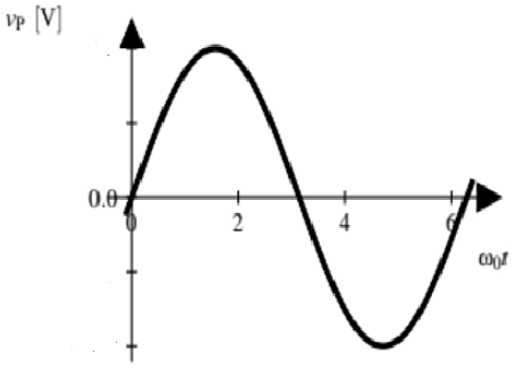
8.

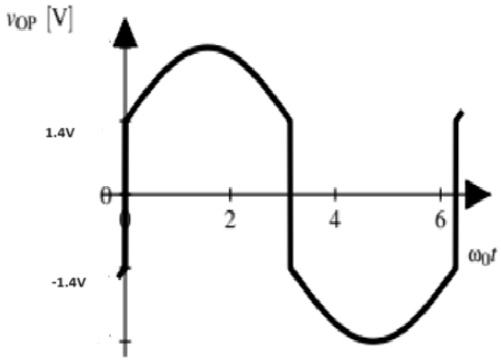
a) Tražene statičke karakteristike prikazane su na slikama.





b) Traženi dijagrami prikazani su na slikama:





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d) Tražena otpornost je $R_{p,min}$ = 02.26 Ω