REŠENJA ZADATAKA

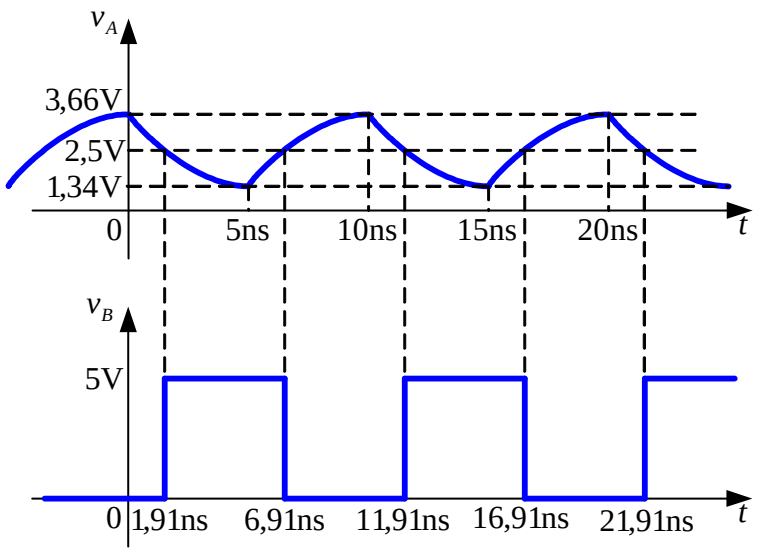
2. a)

$$v_A(t)=\begin{cases}3{,}66\text{V}\cdot e^{-2\cdot 10^8\cdot t}, & 0\le t\le 5\text{ns}\\ 5\text{V}-3{,}66\text{V}\cdot e^{-2\cdot 10^8\cdot (t-5\text{ns})}, & 5\text{ns}\le t\le 10\text{ns}\end{cases}$$, signal se dalje periodično ponaša.

b) $v_A(t_1)=2{,}5\text{V}\quad (za\quad 0<t<5\text{ns})\quad\Rightarrow\quad t_1=1{,}91\text{ns}$

$v_A(t_2)=2{,}5\text{V}\quad (za\quad 5\text{ns}<t<10\text{ns})\quad\Rightarrow\quad t_2=6{,}91\text{ns}$

$$v_B(t)=\begin{cases}5\text{V}, & 1{,}91\text{ns}\le t\le 6{,}91\text{ns}\\ 0, & 6{,}91\text{ns}\le t\le 11{,}91\text{ns}\end{cases}$$, signal se dalje periodično ponaša.



4. Za $t<0$ je: $v_X = V_{DD}$, $v_Y = V_{DD}$, $v_Z = 0$.

Ako se zanemari Δt, za $0<t<T_P$ je:

$v_X = 0$

$v_Y(t) = V_{DD} - [V_{DD} - 0]\cdot e^{-\frac{t}{RC}} = 5\text{V}\cdot(1-e^{-1000t})$

$v_Z = V_{DD}$

Ako se zanemari Δt, za $T_P<t<2T_P$ je:

$v_X = 0$

$v_Y(t) = V_{DD} - [V_{DD} - 0]\cdot e^{-\frac{t-T_P}{RC}} = 5\text{V}\cdot(1-e^{-1000(t-T_P)})$

$v_Z = V_{DD}$

Ako se zanemari Δt, za $2T_P<t<3T_P$ je:

$v_X = 0$

$v_Y(t) = V_{DD} - [V_{DD} - 0]\cdot e^{-\frac{t-2T_P}{RC}} = 5\text{V}\cdot(1-e^{-1000(t-2T_P)})$

$v_Z = V_{DD}$

Ako se zanemari Δt, za $3T_P<t<T_1$ je:

$v_X = 0$

$v_Y(t) = V_{DD} - [V_{DD} - 0]\cdot e^{-\frac{t-3T_P}{RC}} = 5\text{V}\cdot(1-e^{-1000(t-3T_P)})$

$v_Z = V_{DD}$

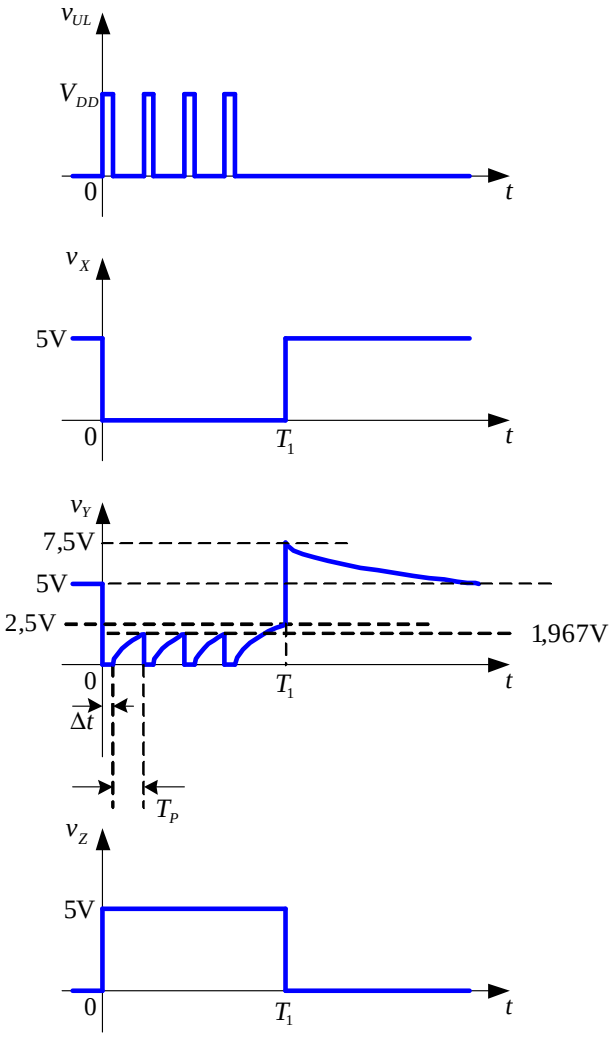
Ako se zanemari Δt, za $t>T_1$ je:

$v_X = V_{DD}$

$v_Y(t) = V_{DD} - [V_{DD} - \frac{3V_{DD}}{2}]\cdot e^{-\frac{t-T_1}{RC}} = 5\text{V} + 2{,}5\text{V}\cdot e^{-1000(t-T_1)}$

$v_Z = 0$

$T_1 = 3T_P + 0{,}001\ln 2 = 2{,}193ms$



6. a) $v_{IZ} = -\frac{V_{REF}}{48R}R_f\left(8Q_3 + 4Q_2 + 2Q_1 + Q_0\right)$.

b) $R_f = 2{,}4\text{k}\Omega$.

S obzirom da je D/A konvertor unipolaran i da je $v_{IZ} \geq 0$, na osnovu rezultata iz tačke a) sledi da mora biti $V_{REF} < 0$.