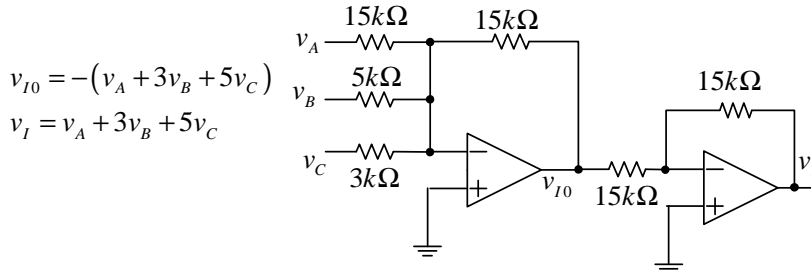


REŠENJA

1. a) $v_D = V_T \cdot \ln \frac{i_D}{I_S} = 25\text{mV} \cdot \ln(2 \cdot 10^{14}) = 25\text{mV} \cdot (\ln(2) + 14\ln(10)) = 0.823\text{V}$

b)



c) $10 = \left(1 + \frac{20k\Omega}{R_0}\right) \left(\frac{10k\Omega}{10k\Omega}\right) \Rightarrow R_0 = \frac{20}{9} k\Omega = 2.22k\Omega$

2. a) $\underline{U}_T = -j\sqrt{2}V, \underline{Z}_T = \left(\frac{1}{4} - j\frac{1}{8}\right)\Omega$

b) $u_T(t) = 2V\sin(\omega t), R_T = \frac{1}{4}\Omega, C_T = 0.8\text{mF}$

c) $\underline{Z}_P = \underline{Z}_T^* = \left(\frac{1}{4} + j\frac{1}{8}\right)\Omega$

d) $i_P(t) = 4A\sin(\omega t)$

3. $v_I = -V_D = -0.7V = \text{const}$, za $-3\text{mA} \leq i_G \leq -1.4\text{mA}$, D_1 -ON, D_2 -OFF.

$v_I[\text{V}] = R_2 i_G = 0.5 \frac{\text{V}}{\text{mA}} \cdot i_G[\text{mA}]$, za $-1.4\text{mA} \leq i_G \leq 1.4\text{mA}$, D_1 -OFF, D_2 -OFF.

$v_I = V_D = 0.7V = \text{const}$, za $1.4\text{mA} \leq i_G \leq 3\text{mA}$, D_1 -OFF, D_2 -ON.

4.

5. a) Potencijal v_x na izlazu prvog operacionog pojačavača je $v_x = v_I - v_G$.

$v_I = 3v_G - 3v_x = 3v_G - 3v_I + 3v_G$

$4v_I = 6v_G \Rightarrow v_I = 3v_G / 2$

b) $v_x = v_I - v_G$.

$v_I = 4v_G - 3v_x = 4v_G - 3v_I + 3v_G$

$4v_I = 7v_G \Rightarrow v_I = 7v_G / 4$

c) $v_I(t) = 6\text{mV} - 14\text{mV}\cos(\omega t)$.