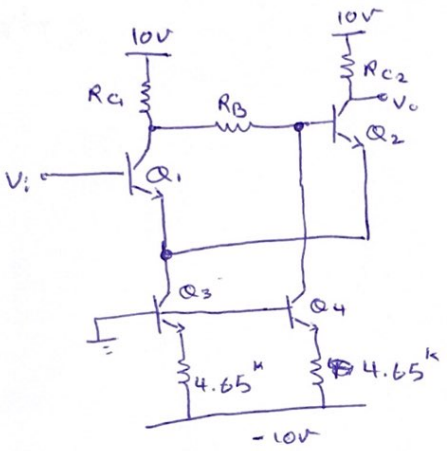
یا لطیف

رضا دینی پور
۹۸۱۴۳۰۳۰
کوئیز دوم پالس

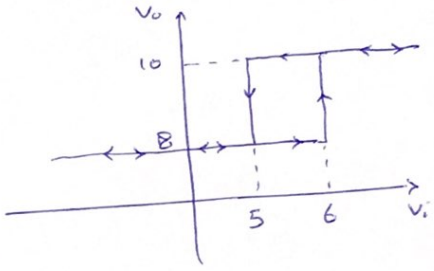
#1



$V_{BE} = 0.7V$

$\beta = 100$

$V_\gamma = 0.5V$

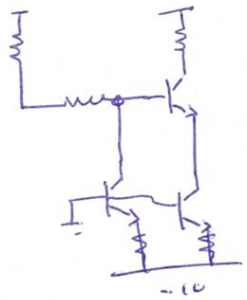


$\begin{cases} UTP: 10 \\ LTP: 8 \end{cases}$

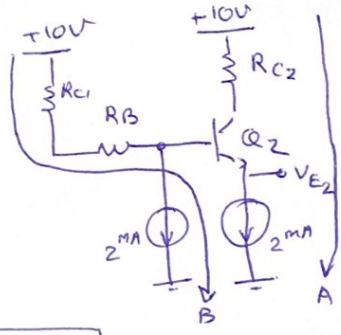
$V_{B3} = V_{B4} = 0\,V \Rightarrow V_{E3} = V_{E4} = 0 - 0.7 = -0.7\,V$

$I_{Q3} = \frac{V_{E3}+10}{4.65^K} = \frac{-0.7+10}{4.65} = 2\,MA$ $\quad I_{Q4} = 2^{MA}$

فرض: $\begin{cases} Q_1: off \\ Q_2: ON \text{ (اشباع)} \end{cases} \Rightarrow$



$\equiv$



$\Rightarrow I_{E2} \approx I_{C2} = 2^{MA}$

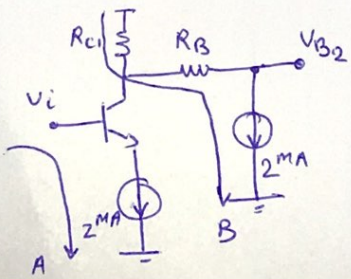
$\Rightarrow V_i = UTP: V_{E2} + 0.7 \Rightarrow V_{E2} = 10 - 0.7 = 9.3 \Rightarrow V_E = 9.3$

$A: KVL: 10 = R_{C2}(2^{MA}) + \underbrace{0.2}_{=V_{CE2}} + 9.3 \Rightarrow R_{C2} = \frac{0.5}{2} = 0.25^{K\Omega} = 250^{\Omega}$

$B: KVL: -10 + R_{C1}I + R_B I + 0.7 + 9.3 = 0$

$\Rightarrow (R_{C1}+R_B)I = 0 \xrightarrow[I_B = 0.019]{I = 2 + I_B} R_{C1} + R_B(2.019) = 0$

فرض: $\begin{cases} Q_1: ON \\ Q_2: off \end{cases} \Rightarrow$



KVL in A: $-V_i + 0.7 + V_E = 0$

$V_{B2} = V_E + 0.7 \xrightarrow{V_E = V_i - 0.7}$

$V_{B2} = V_i = LTP = 5\,V$

ادامه سوال ۱ : KVL in B : $-10 + R_{C_1}[+ R_B[+ 5 = 0$

$I = 2^{mA} + I_E = 4^{mA} \longrightarrow -10 + 4^{mA}(R_{C_1} + R_B) + 5 = 0$

$\boxed{4R_{C_1} + 4R_B = 5} \Rightarrow \begin{cases} 4R_{C_1} + 4R_B = 5 \\ 2.019R_{C_1} + 2.019R_B = 0 \end{cases}$ با حل دستگاه

$R_{C_1} = 1.7^K$, $R_B = 0.5^K$