Question #1: MOS Flip Flop:
$V_T = 2V, k = 2mA/V^2$

a. Find $V_{OH}$
b. Find $V_{OL}$ solve directly or use two iterations.

Question #2: ECL Flip Flop
$B1 = B2 = \infty, B3 = 10, V_{BE(on)} = V_{D(on)} = 0.7V$
Neglect the base currents of Q1 and Q2 but not Q3.

a. Find the value of $R_{C1}$ that will yield a $V_{OL} = -3V$
b. Find $V_{OH}$ if $R_{C1}$ is set to $300\Omega$
c. Find the power in the cell for $V_{OL} = -3V$
Question #3: MOS Flip Flop
$V_T = 2V, k = 1mA/V^2$

\[ a. \text{Find } V_{OL} \]
\[ b. \text{Find } V_{OH} \]

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Question #4: FET Flip Flop:
\[ I_{DS} = K((V_{gs} - V_T)V_{DS} - V_{DS}^2/2), \quad K = 1mA/V^2, \quad V_T = 1V \]

With one iteration, determine the value of $V_{OL}$
Question #5: ECL Flip Flop
\( \beta = 10 \)

- Find \( V_{OH}, V_{OL} \). Do not neglect the base currents.
- Find the power dissipated in the cell when \( V_O = V_{OL}, V_{OH} \).

\[ P(Q) = V_{CE}*I_C + V_{BE}*I_B \]

Question #6:
For the circuit below, solve for \( V_{OL}, V_{OH} \). Use 2 iterations. \( k=0.1\text{mA/V}^2, V_T = 1\text{V} \).