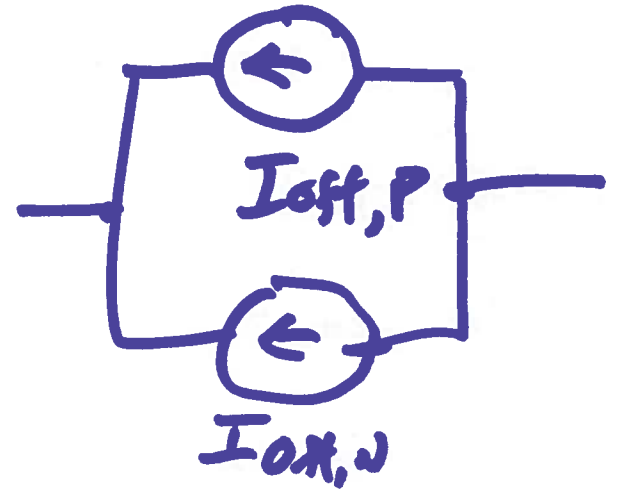
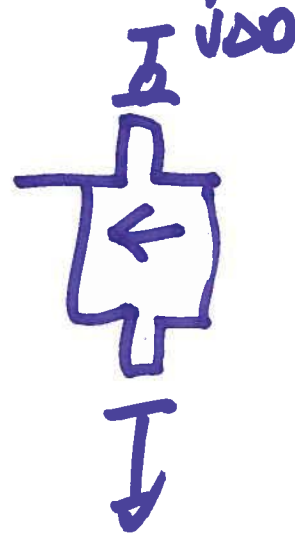
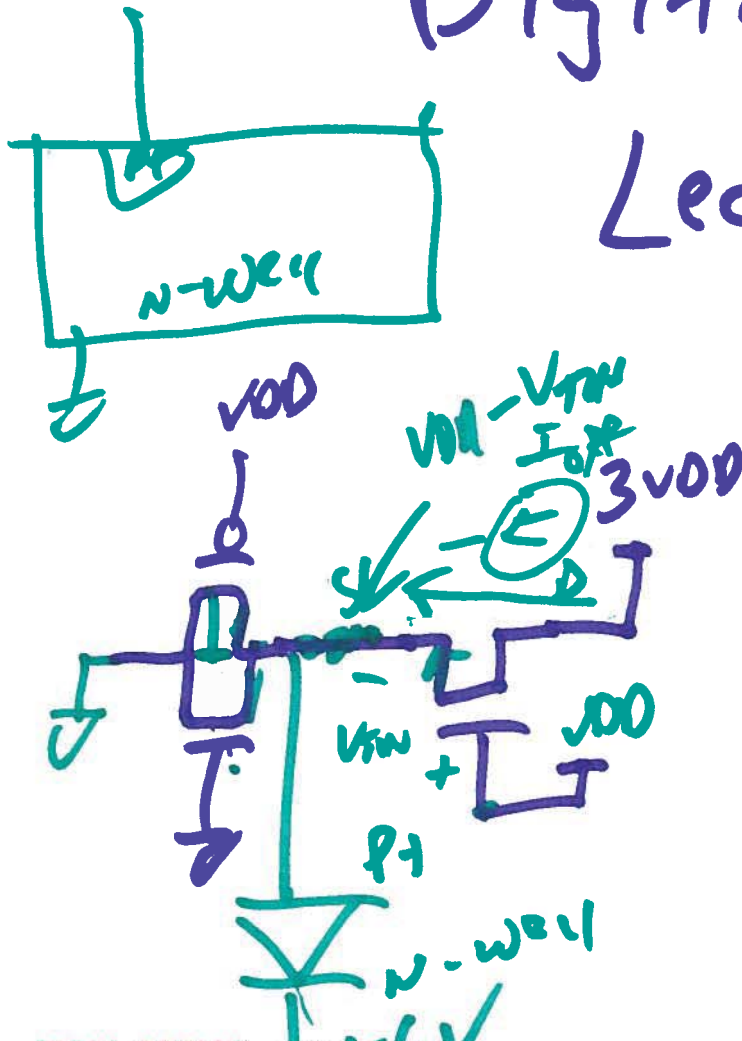


EE 421 / ECG 621

Digital IC Design

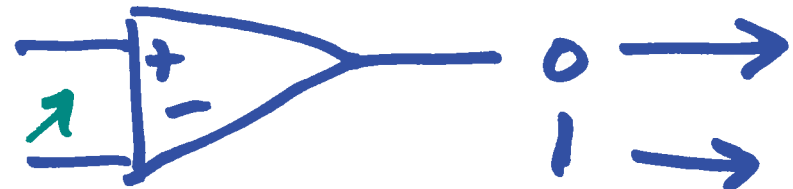
Lecture 17

NOV. 2, 2016





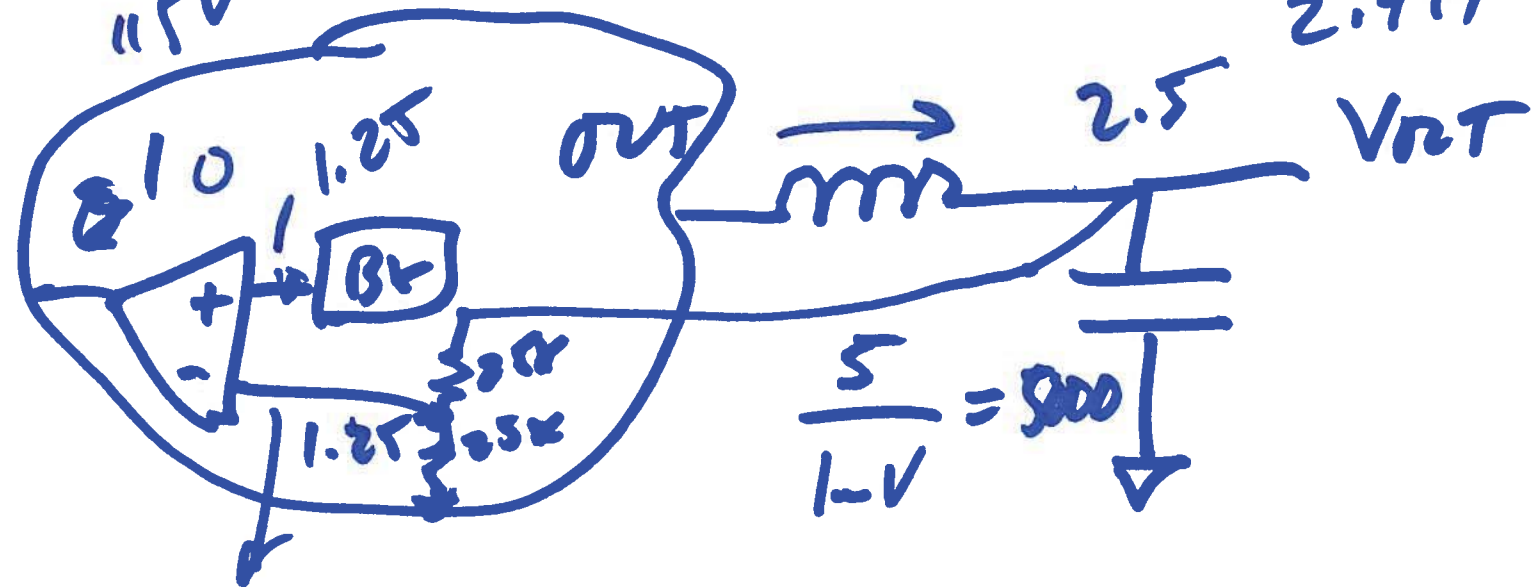
5V



COMPARATOR

$$V_+ < V_- \rightarrow (V_+ - V_-) < 0$$

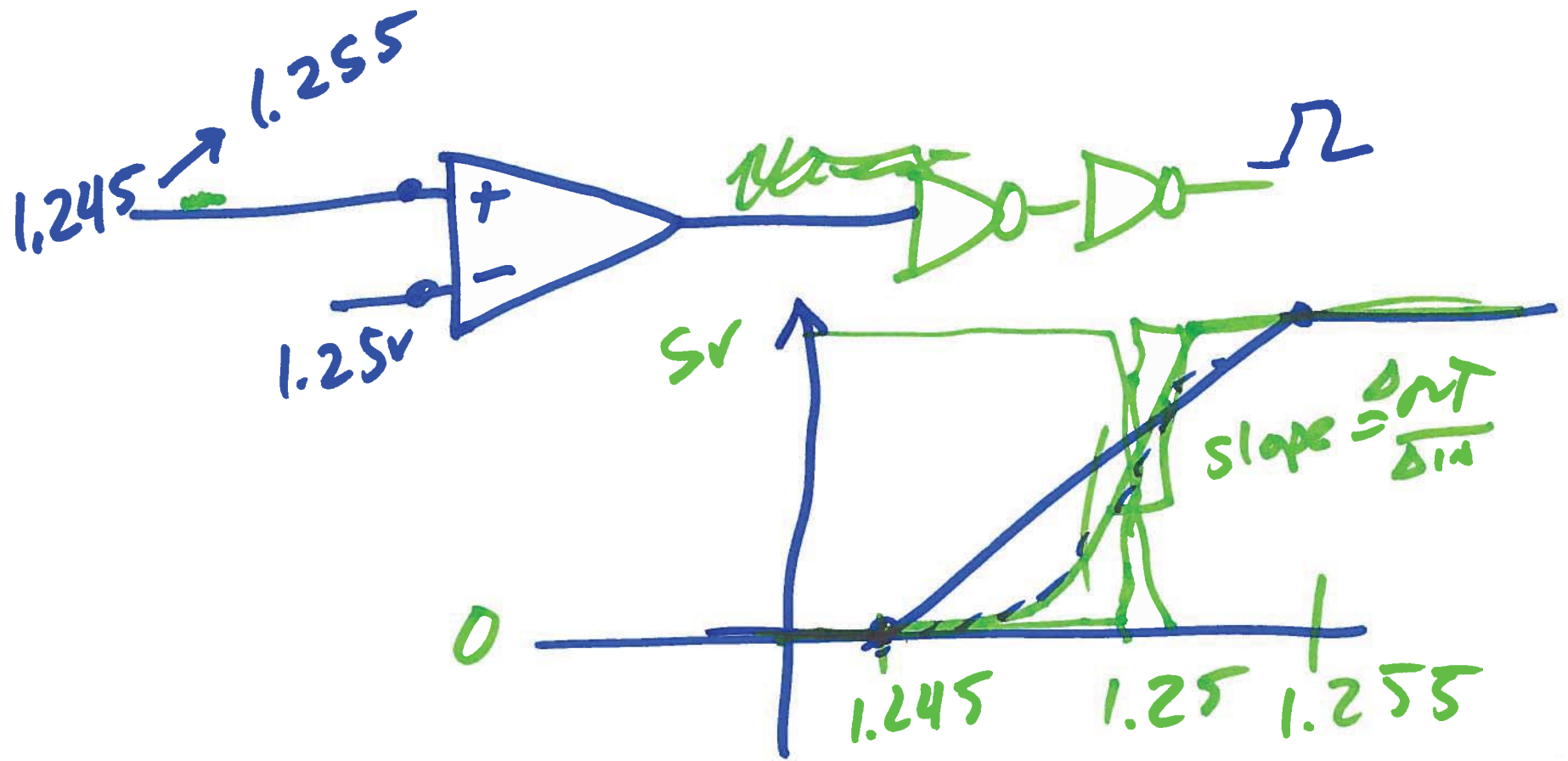
$$V_+ > V_- \rightarrow (V_+ - V_-) > 0$$

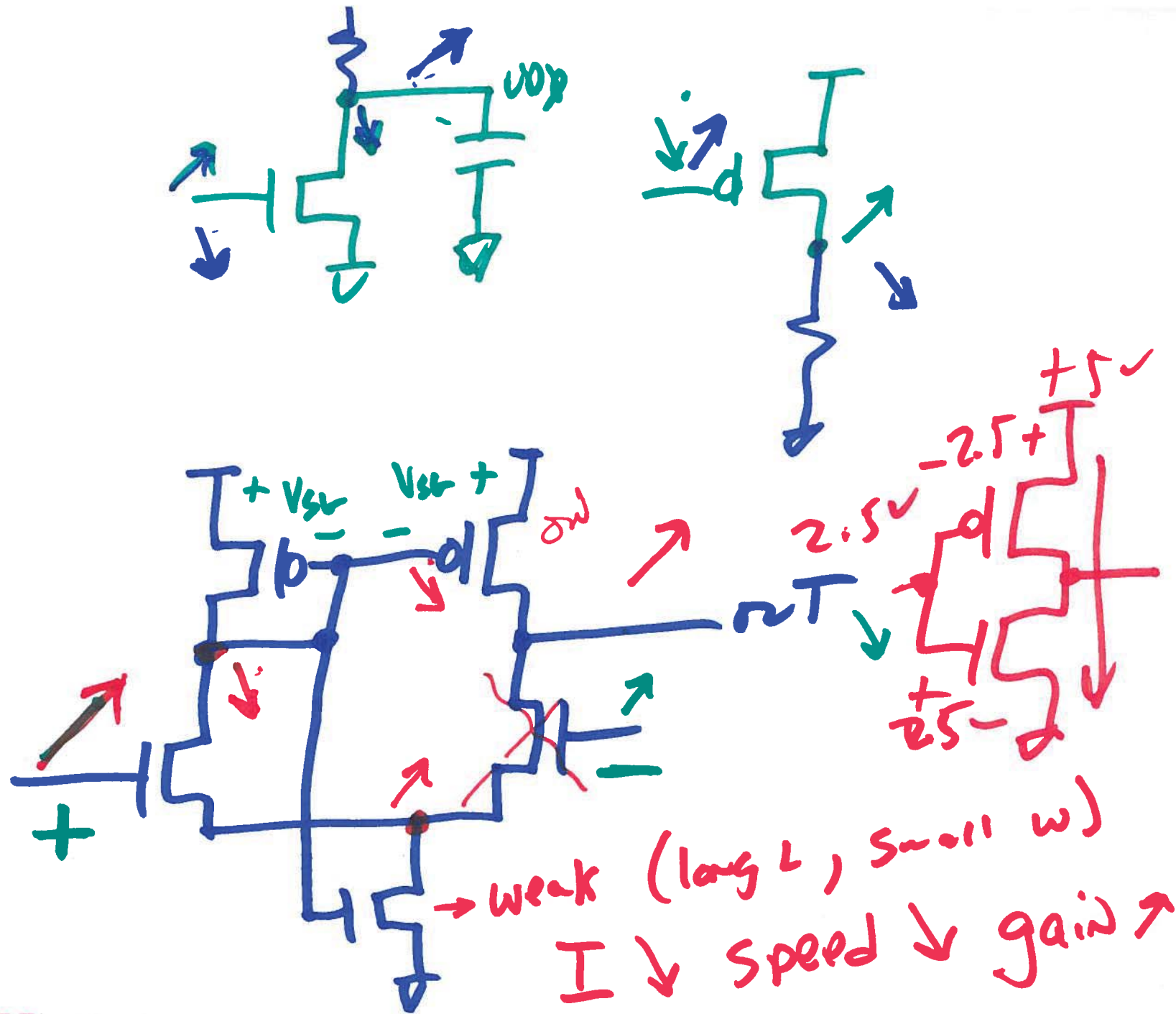


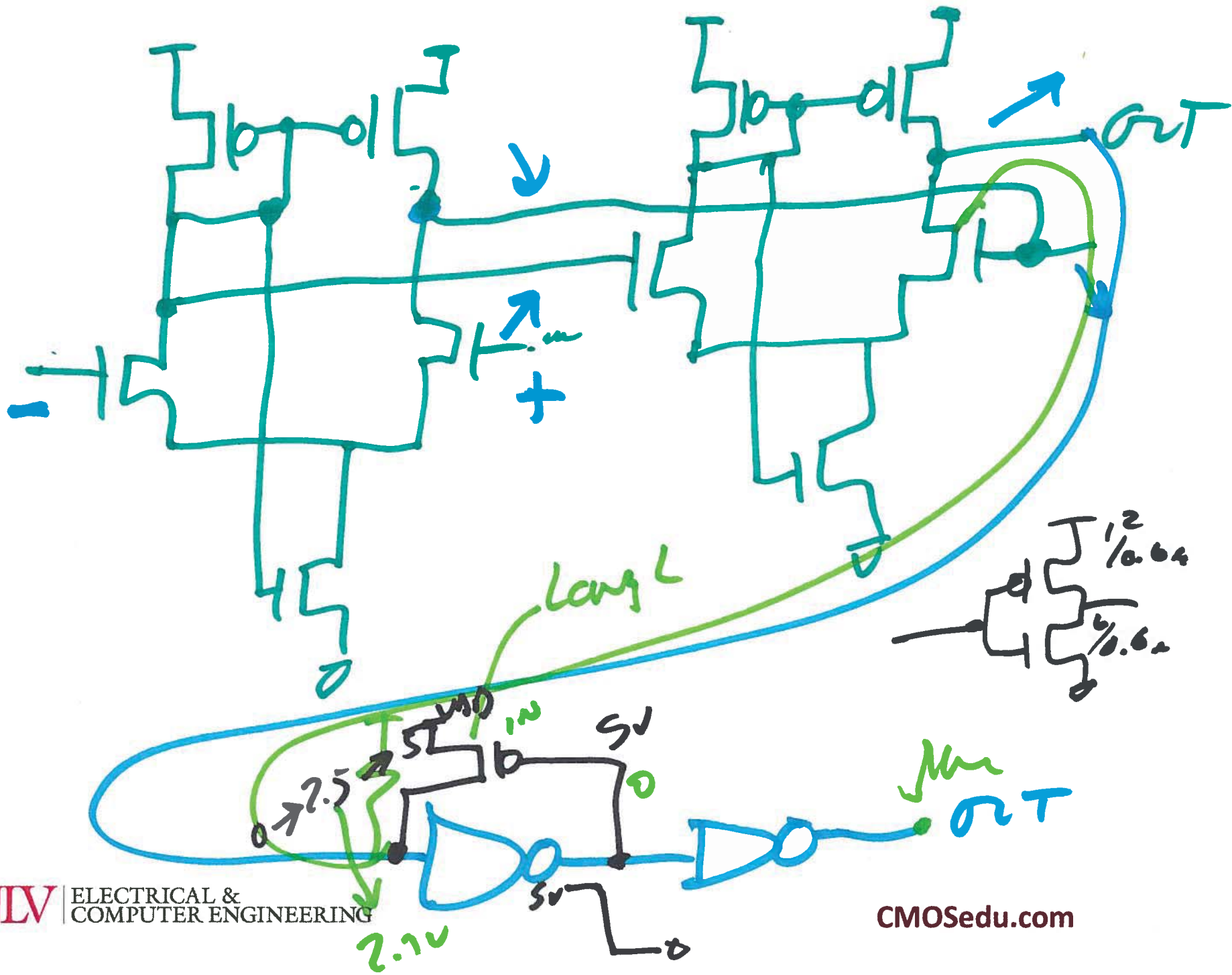
100

$$\frac{5}{100} = 5000$$

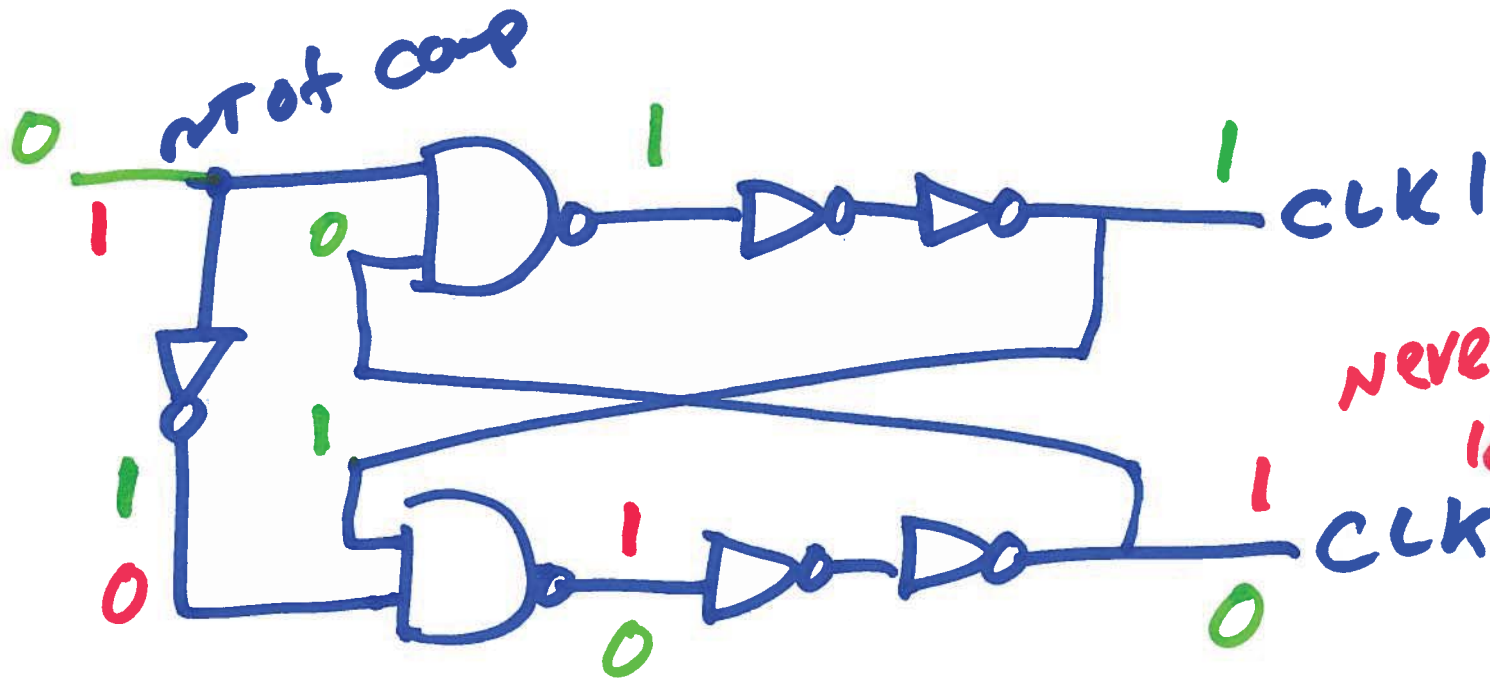
2.499
V_{OUT}



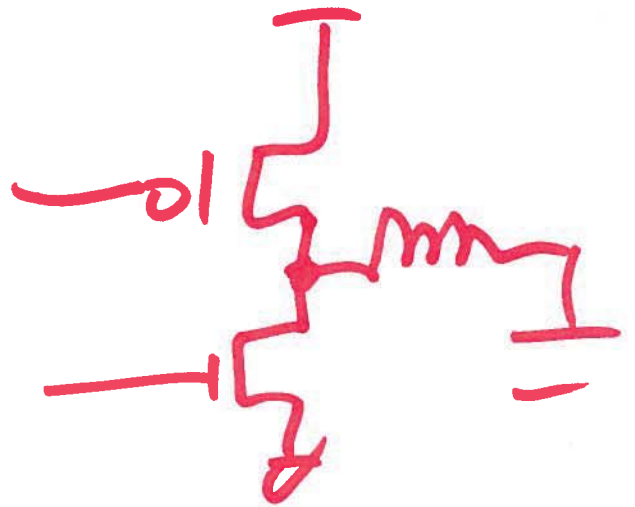
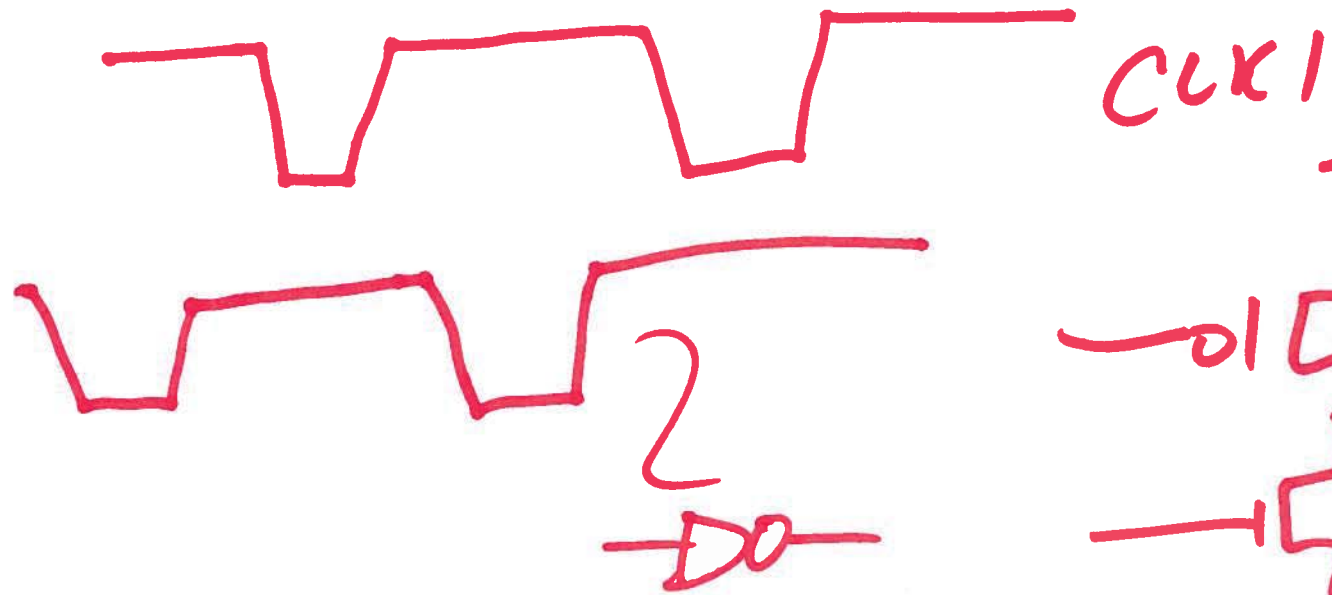




6)

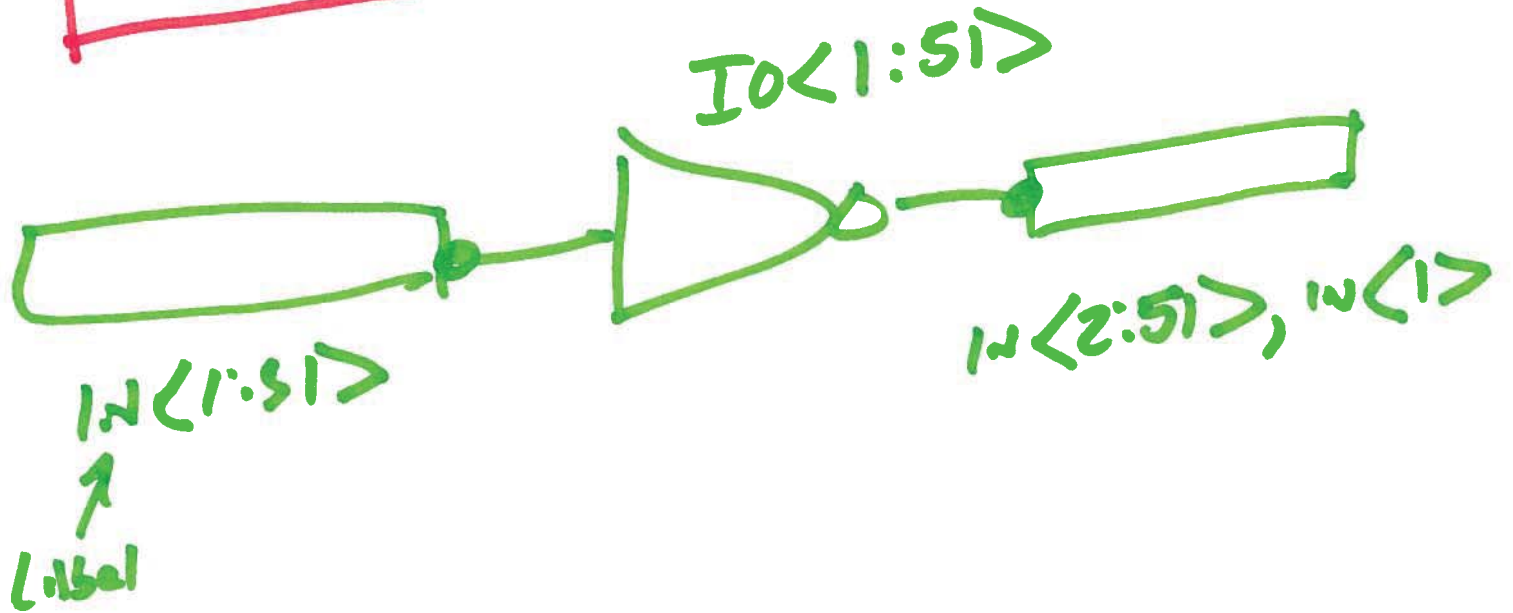
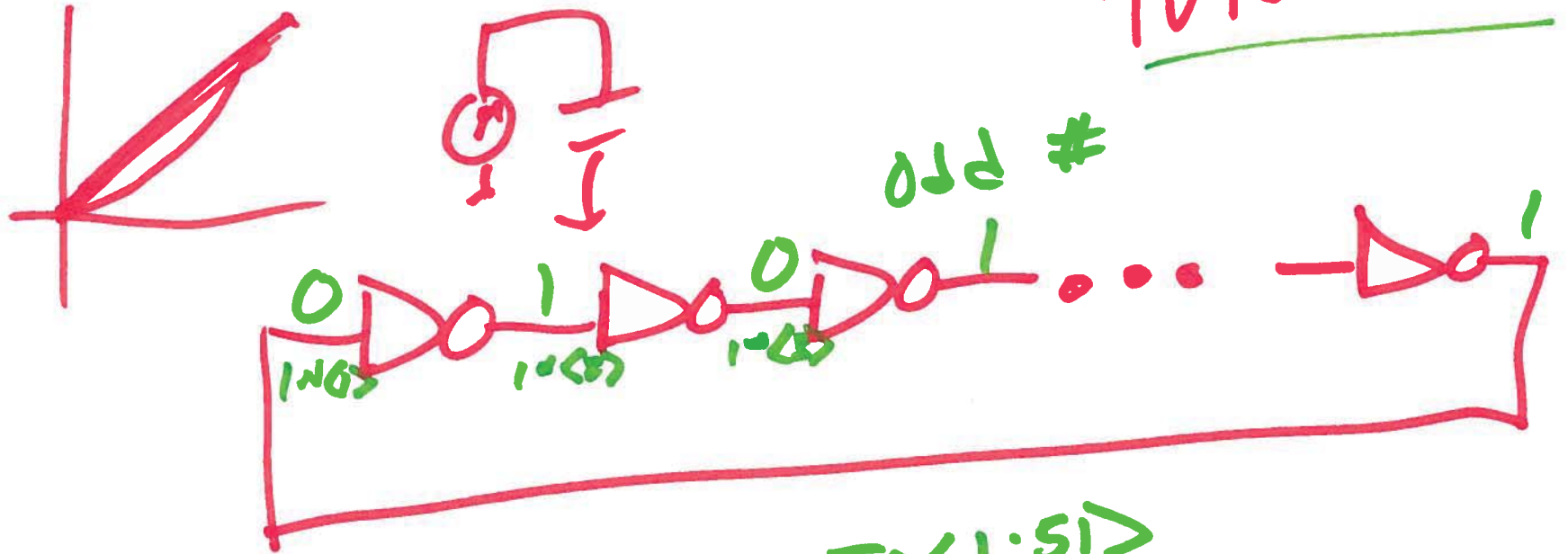


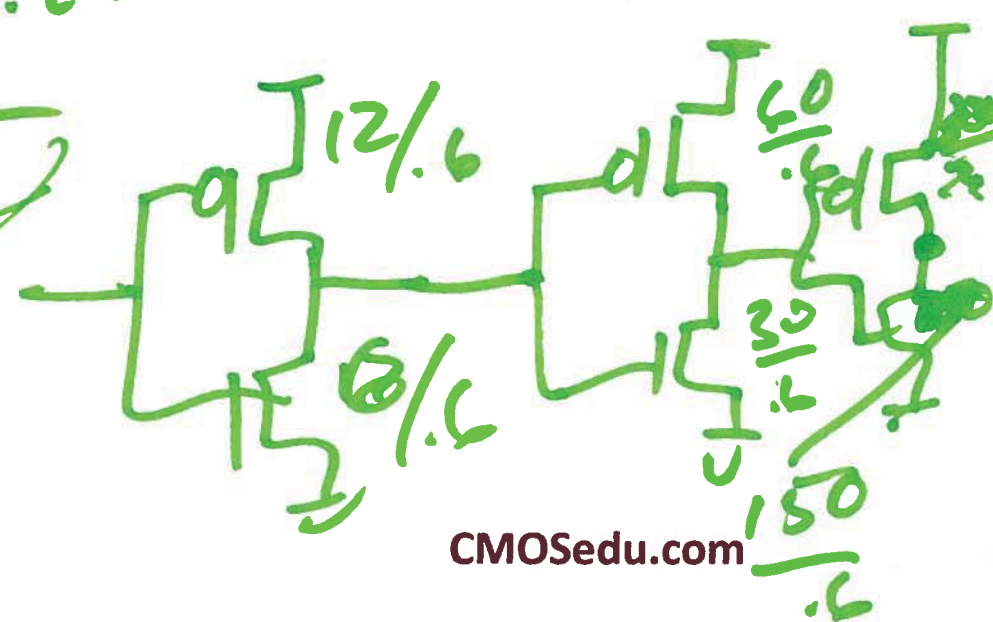
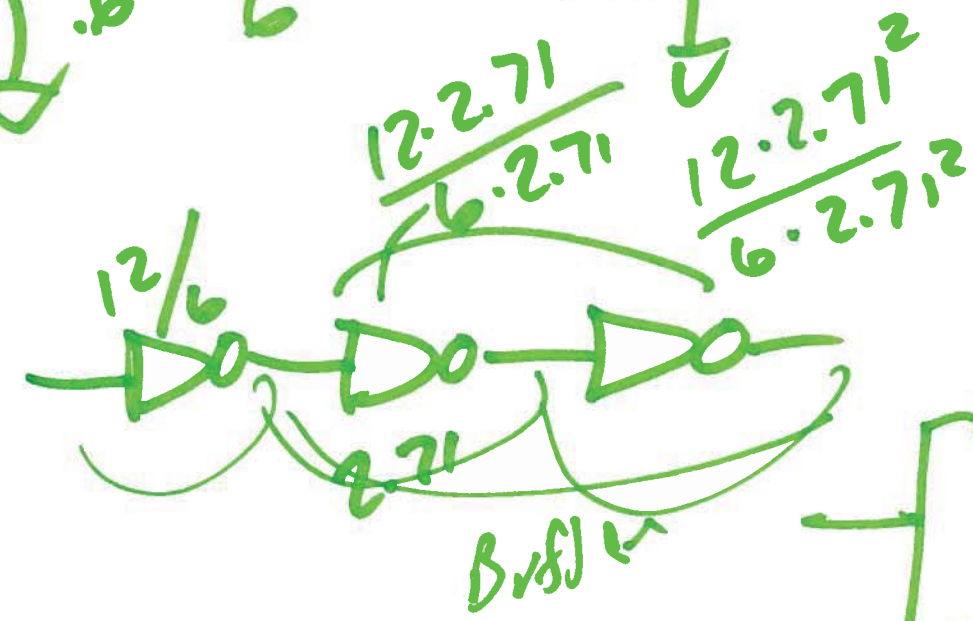
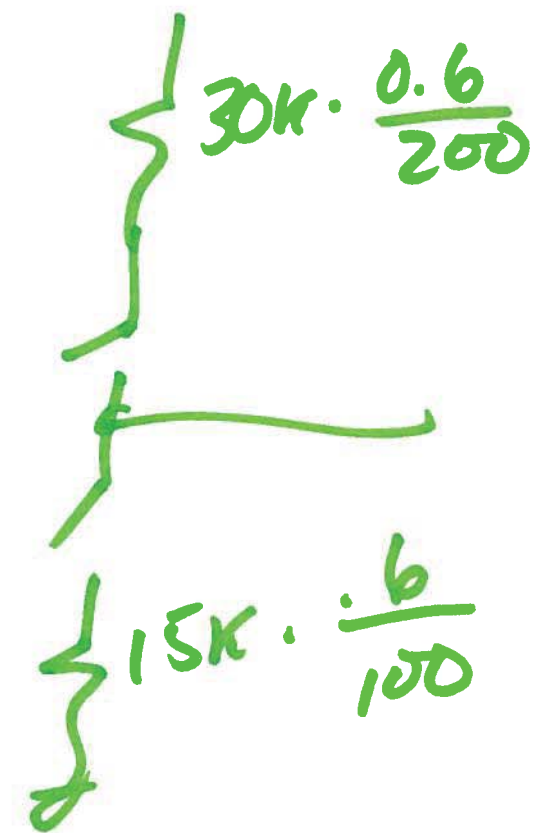
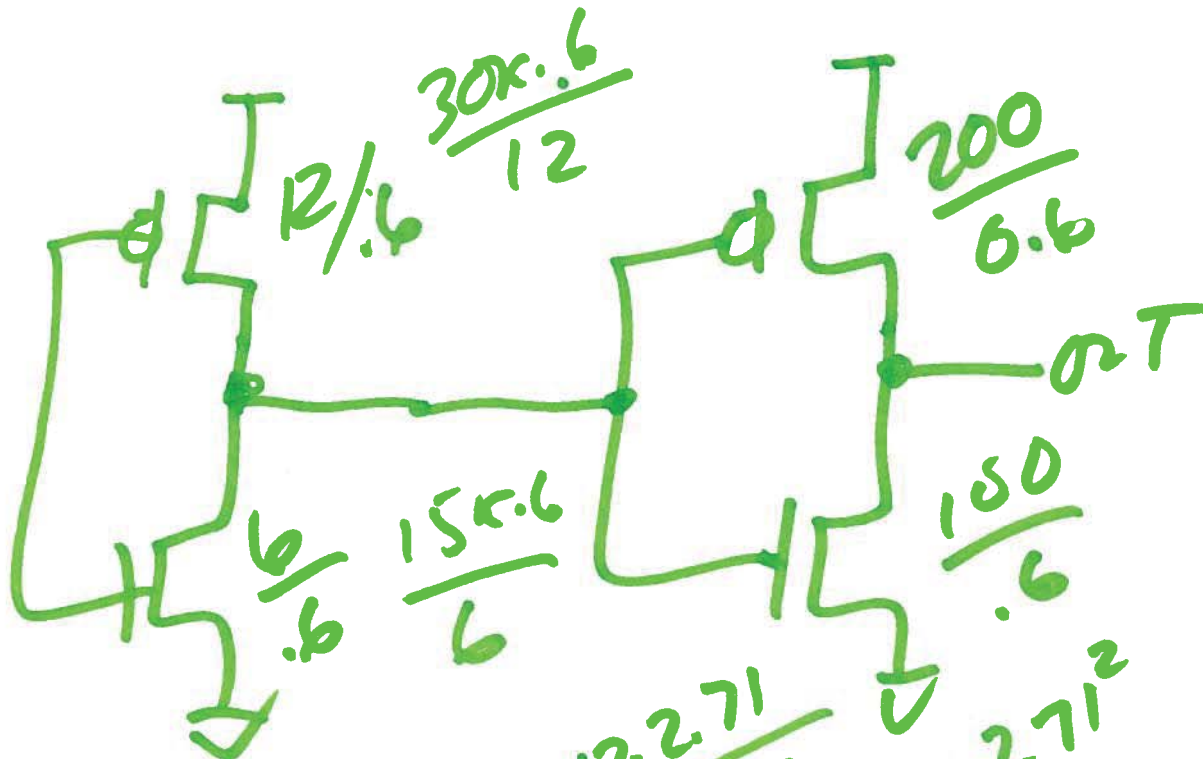
never be low at same time

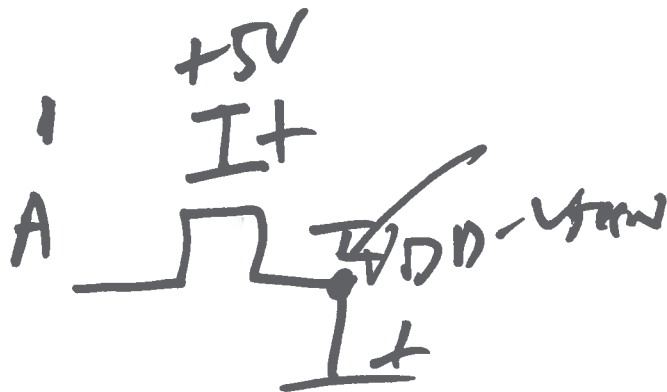
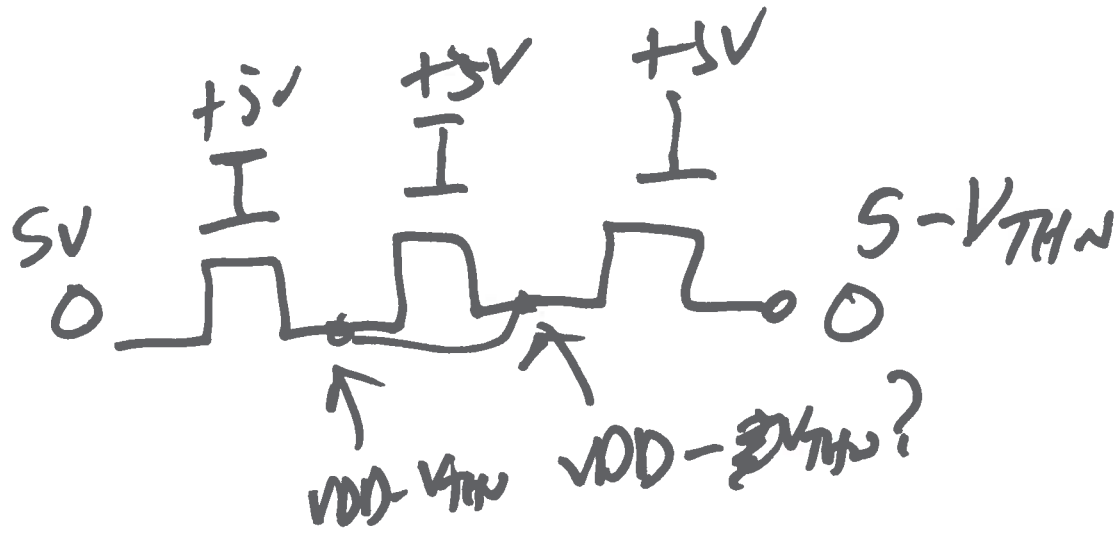


Ring Oscillator

Tutorial 5







$B' \quad L = z = V_{DD} - 2V_{thn}$

9)