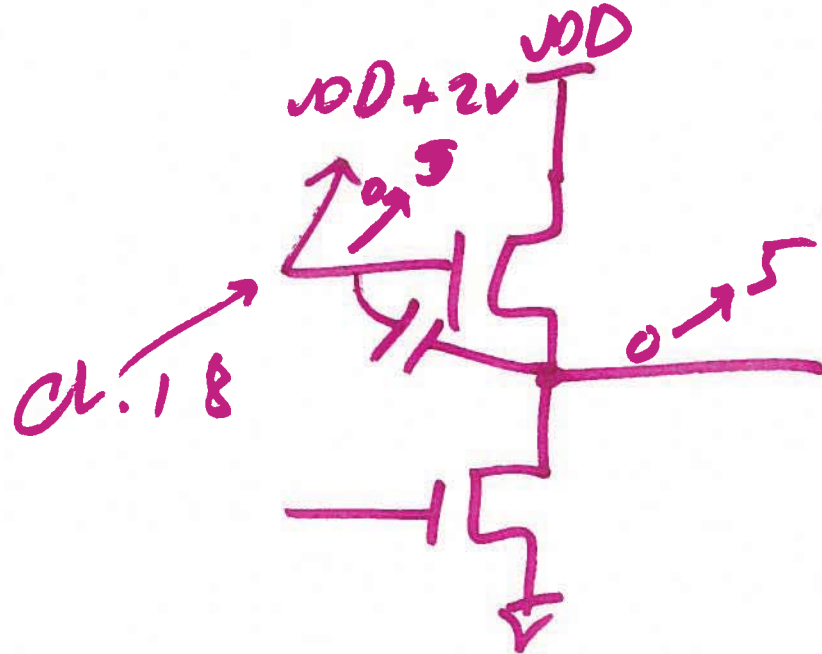


EE 421 / ECG 621

CMOS Digital IC DESIGN

Lecture 18

NOV. 1, 2017



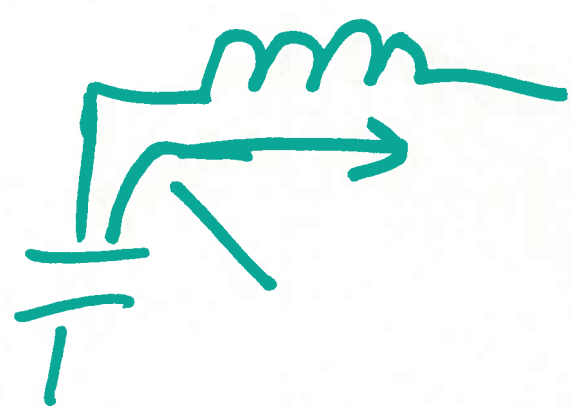
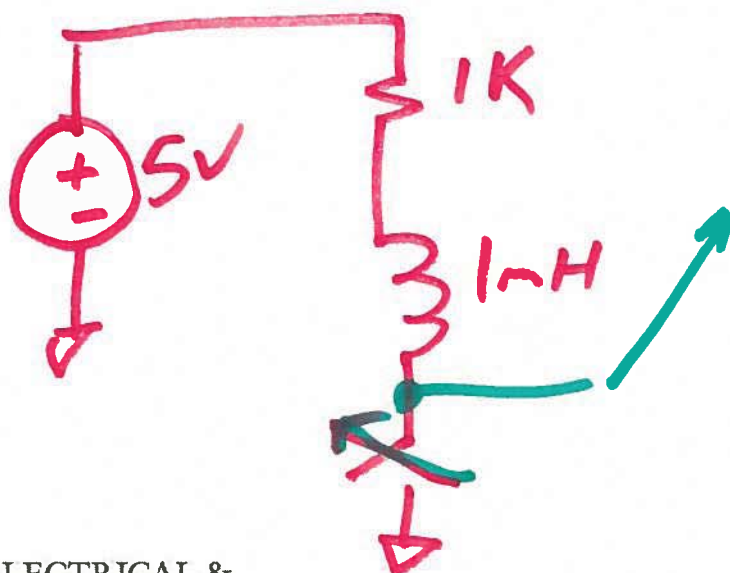
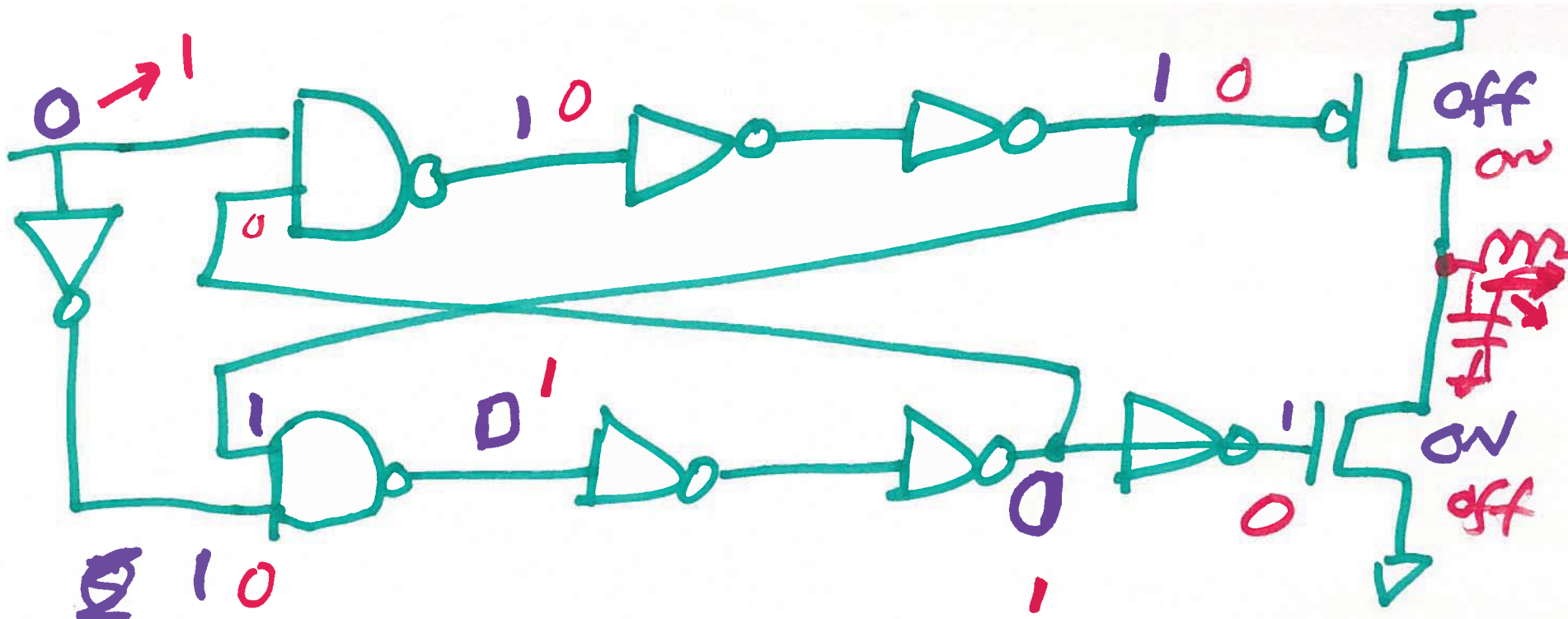
50pF · 10k

500ns

2MHz

I =

1)

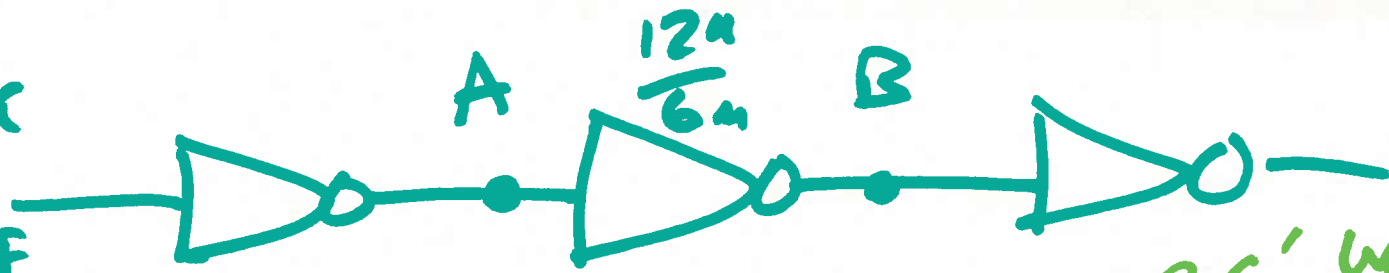


2)

$$R_p' = 40k$$

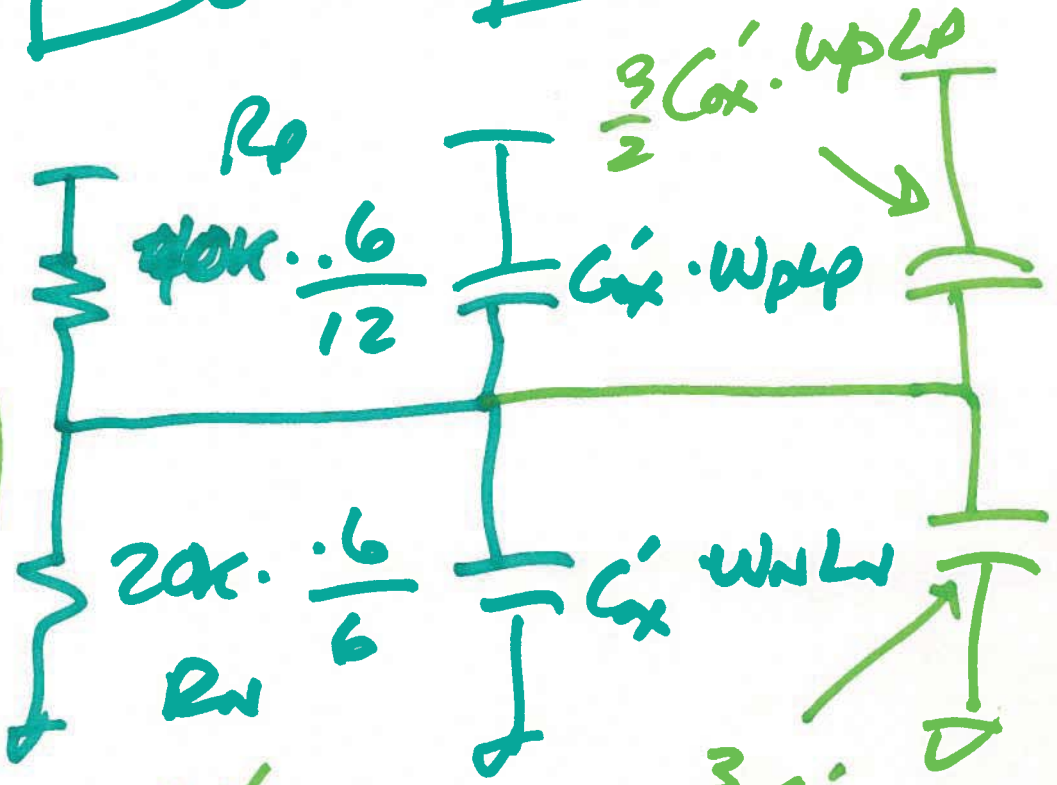
$$R_n' = 20k$$

$$C_{ox}' = \frac{2.5 fF}{4 \mu m^2}$$

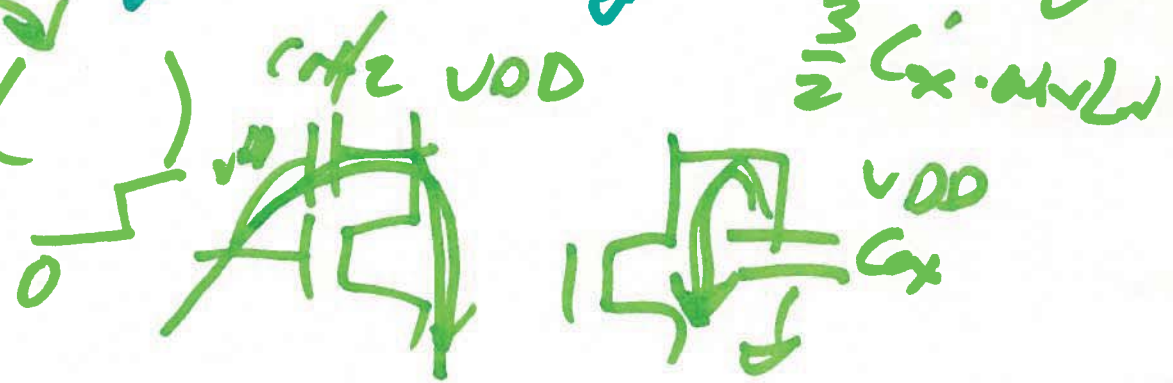


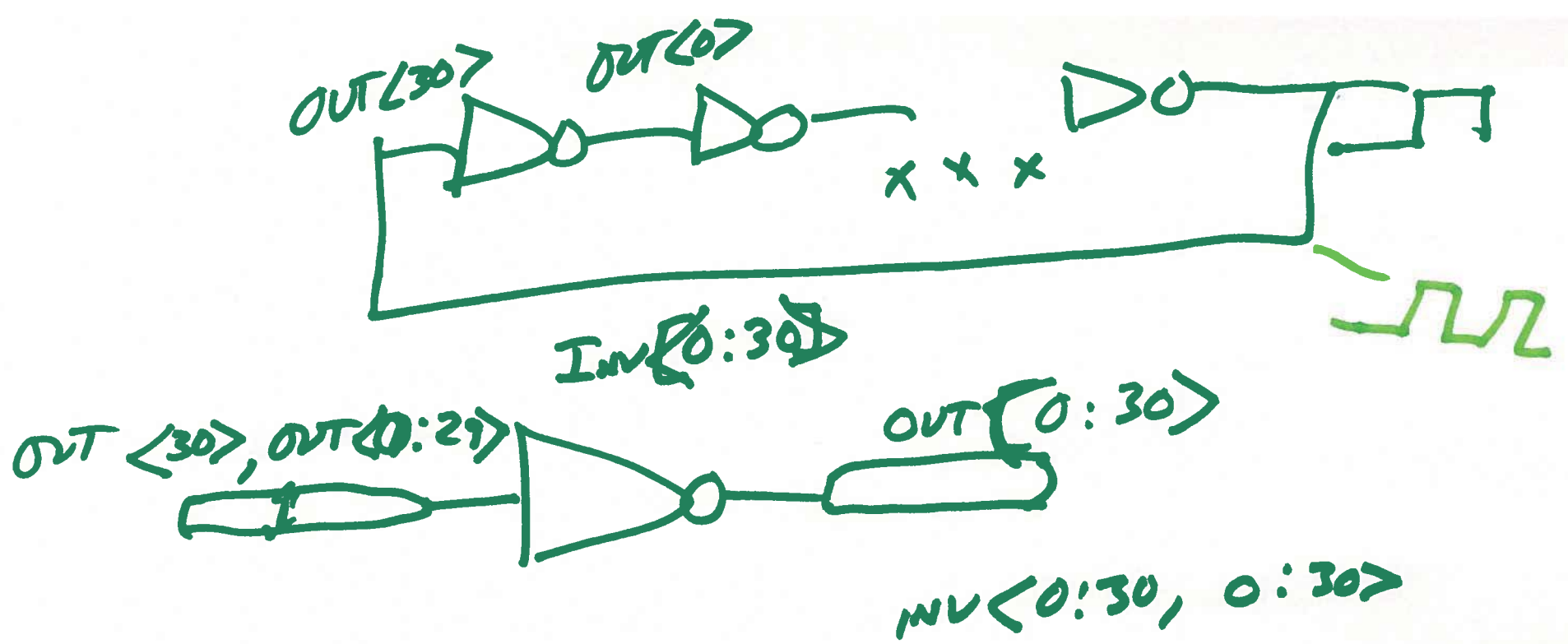
$$t_{pLH} = 0.7 R_p'$$

$$\left(\frac{5}{2} C_{ox}' \cdot W_p L_p + \frac{5}{2} C_{ox}' \cdot W_n L_n \right)$$



$$t_{pHL} = 0.7 R_n'$$





$$f_{osc} = \frac{1}{N(t_{PHL} + t_{PLH})}$$

41)