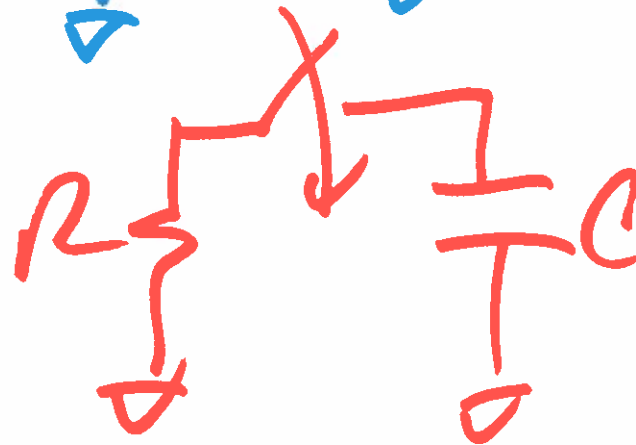
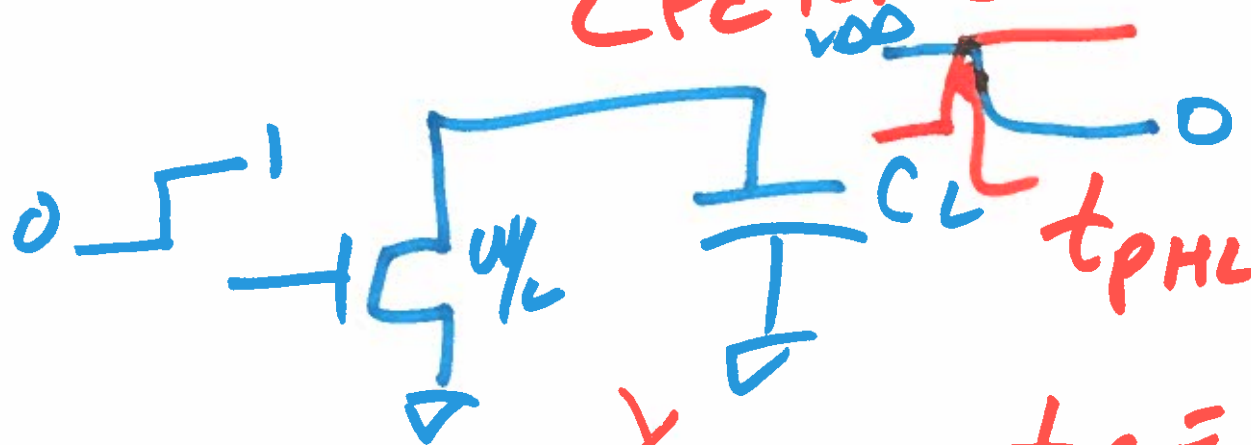


EE421 / ECG-621 Digital IC Design

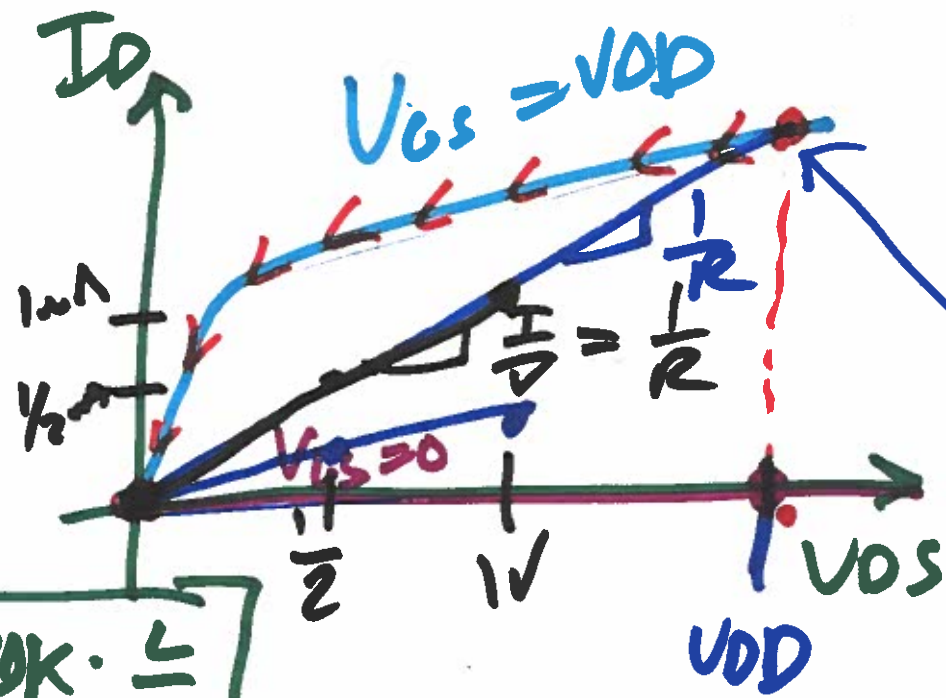
OCT. 21, 2019

Lecture 15



$$t_f = \approx 0.7RC$$
$$\approx$$

1)

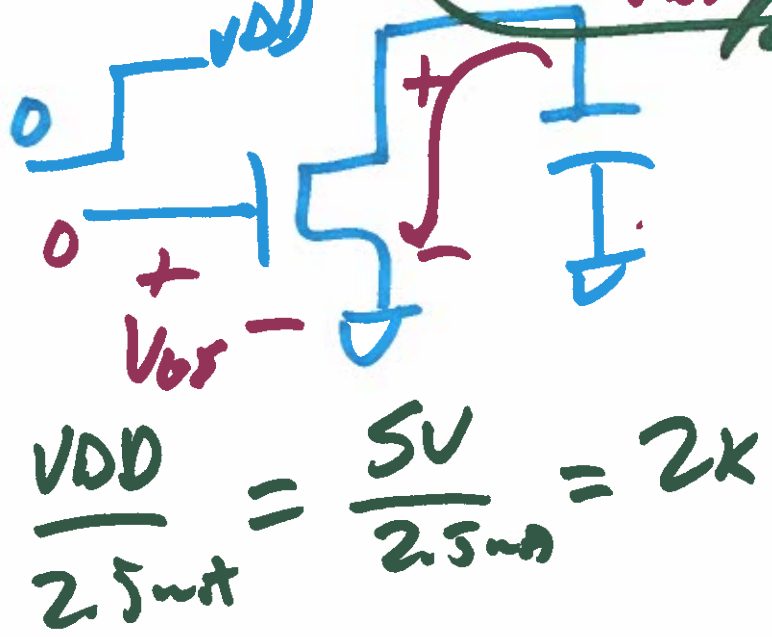
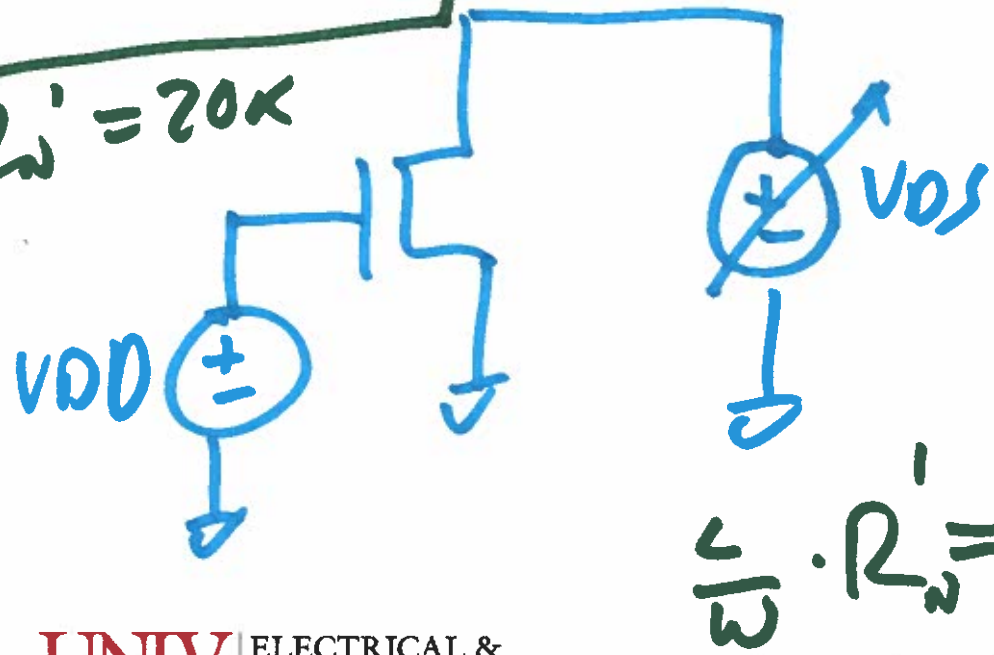


$$I_D = \frac{W}{L} \frac{K_P}{2} (V_{DD} - V_{GS})^2$$

$$R_{W} = 20K \cdot \frac{L}{W}$$

$$R_{W}' = 20K$$

$$R_{W} = \frac{2}{K_P} \cdot \frac{(V_{DD} - V_{GS})^2}{V_{DD}}$$

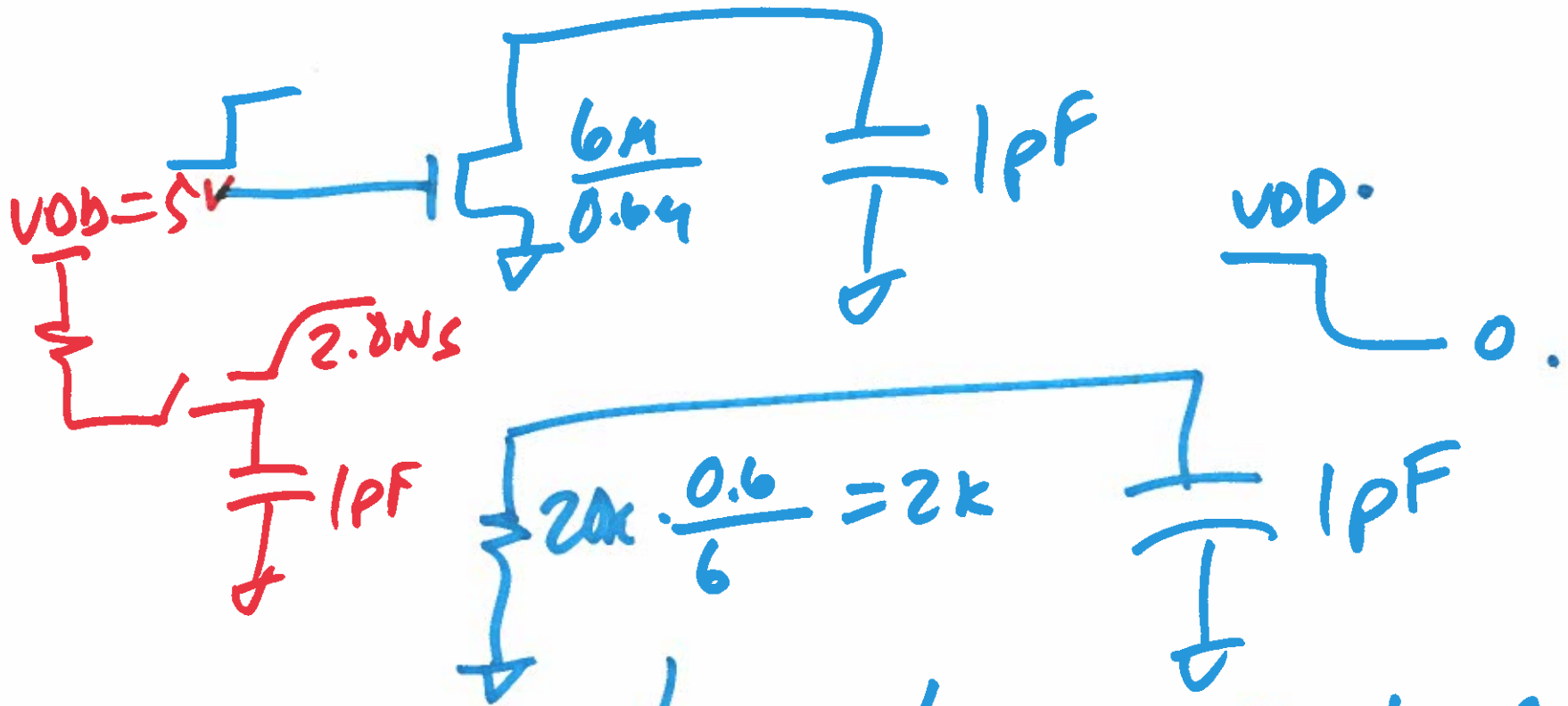


$$\frac{V_{DD}}{2.5 \mu A} = \frac{5V}{2.5 \mu A} = 2K$$

2)

$$R_{i'} = 20k$$

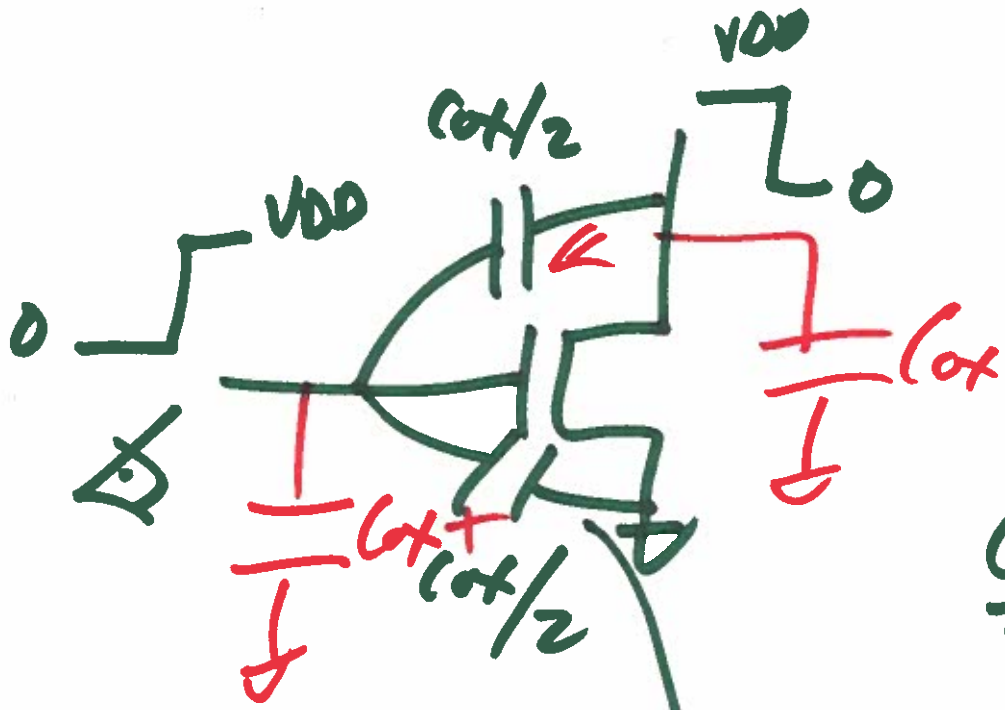
$$R_w = R_{i'} \cdot \frac{L}{w}$$



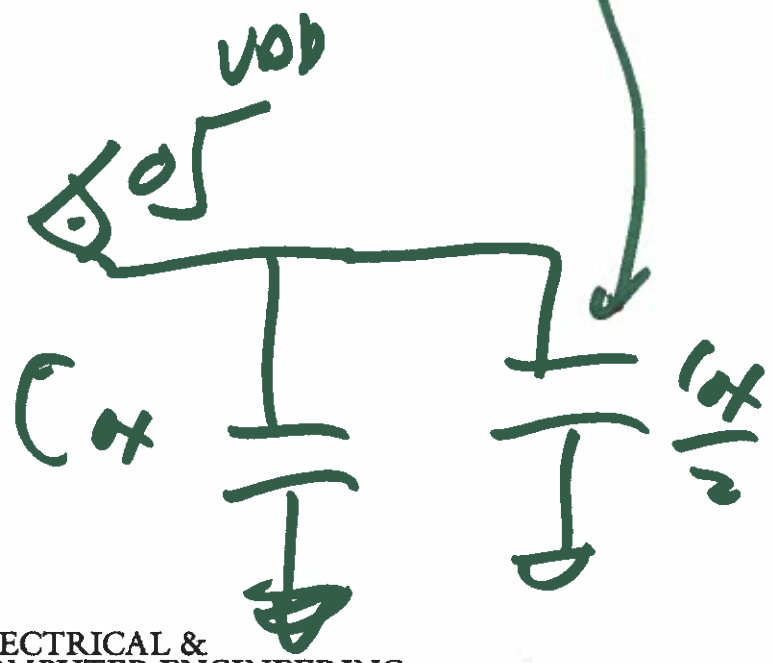
$$t_d = t_{pHL} = 2k \cdot 1p \cdot 0.7$$

$$t_{pHL} = 1.4ns$$

3)



$$C_{ox} \cdot VDD \cdot 2$$

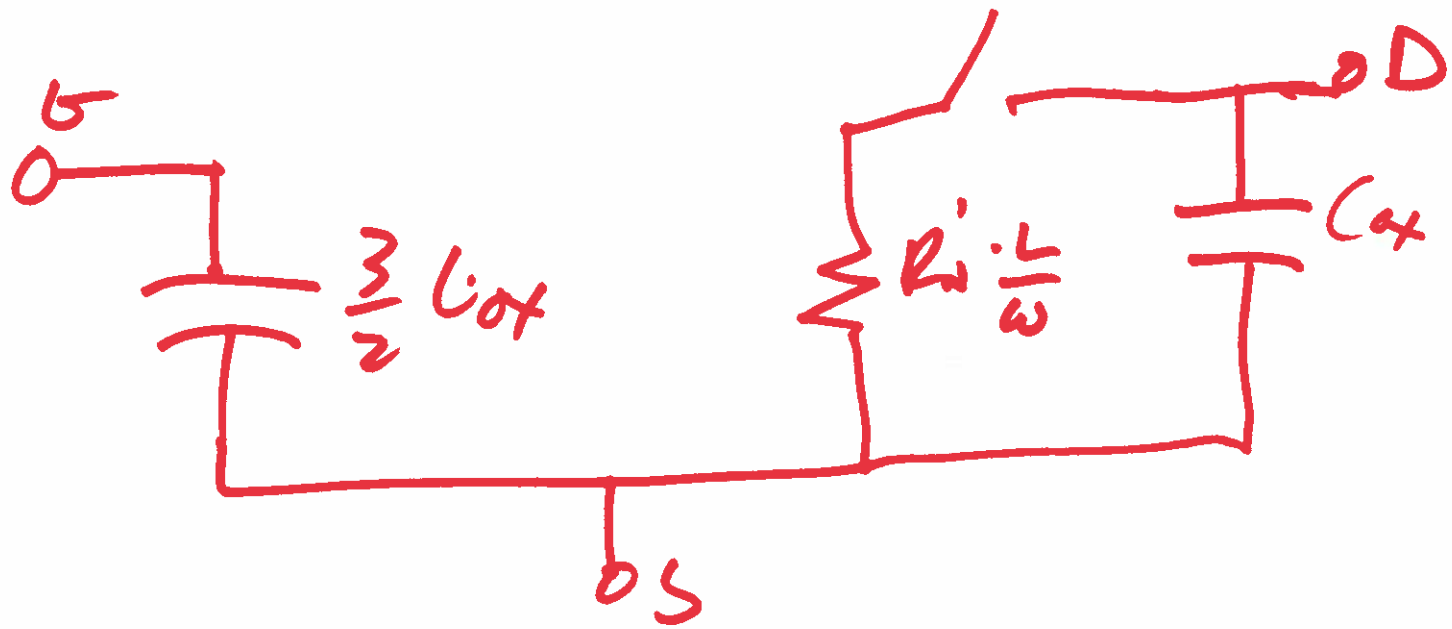


$$C_{ox} = C'_{ox} \cdot W \cdot L$$

$$C'_{ox} = \frac{\epsilon_{ox}}{t_{ox}}$$

$$= \frac{3}{2} C_{ox}$$

4)



5)