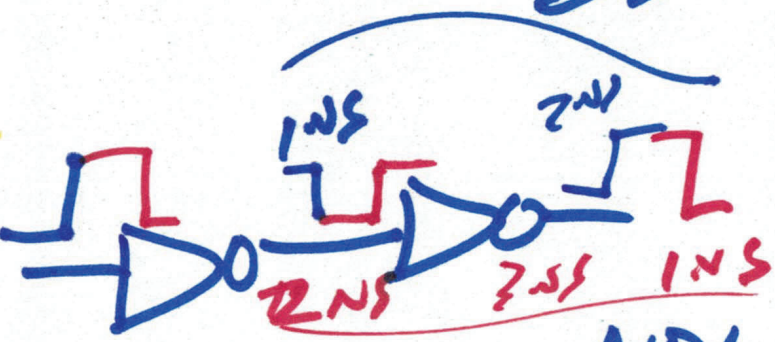


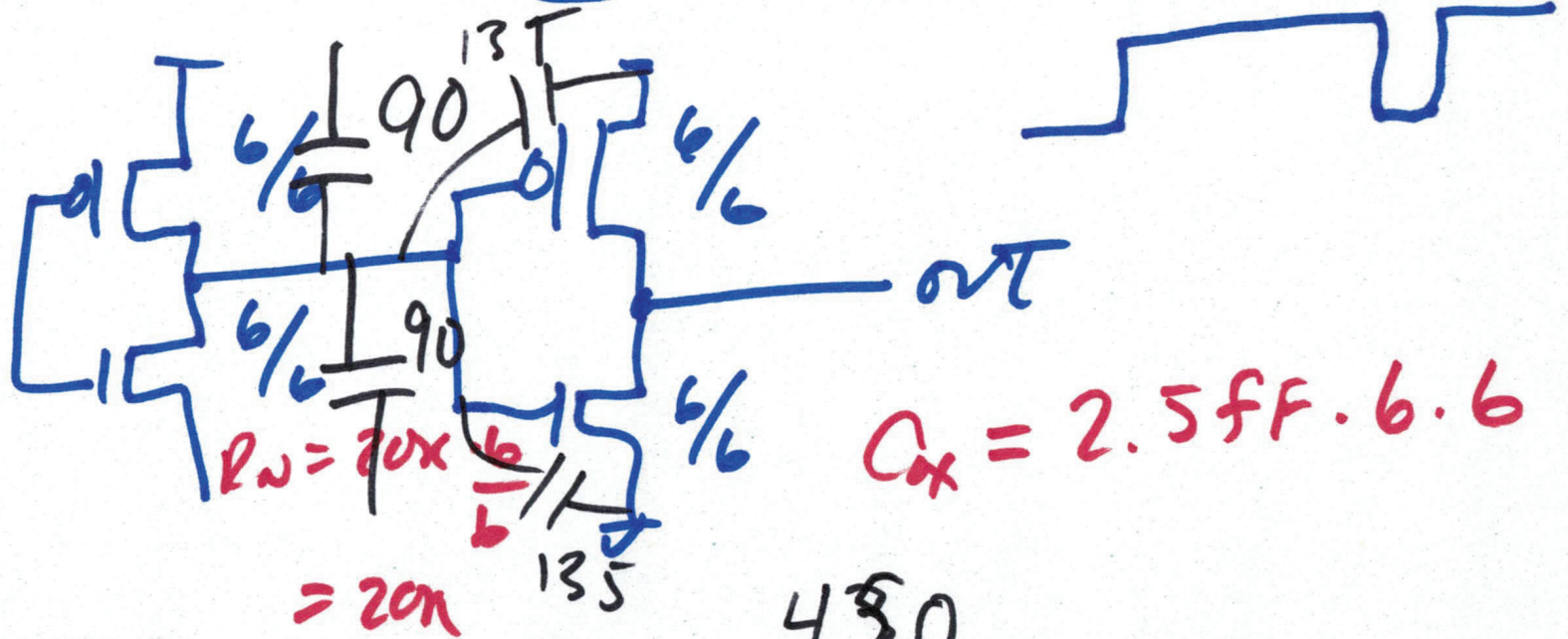
3 VEE 421/621

Digital IC Design



$t_{pLH} = 2 \text{ ns}$ NOV. 18, 2020

$t_{pHL} = 1 \text{ ns}$ $R_p = 40k \cdot \frac{6}{6}$
 $40k$ Lecture 23



$C_{ox} = 2.5 \text{ fF} \cdot 6 \cdot 6$

430

1)

$$t_{pLH} = 40K \cdot .7 \cdot 450fF = 12.6N$$

$$t_{pHL} = ~~20K~~ 20K \cdot .7 \cdot 450fF = 6.3N$$

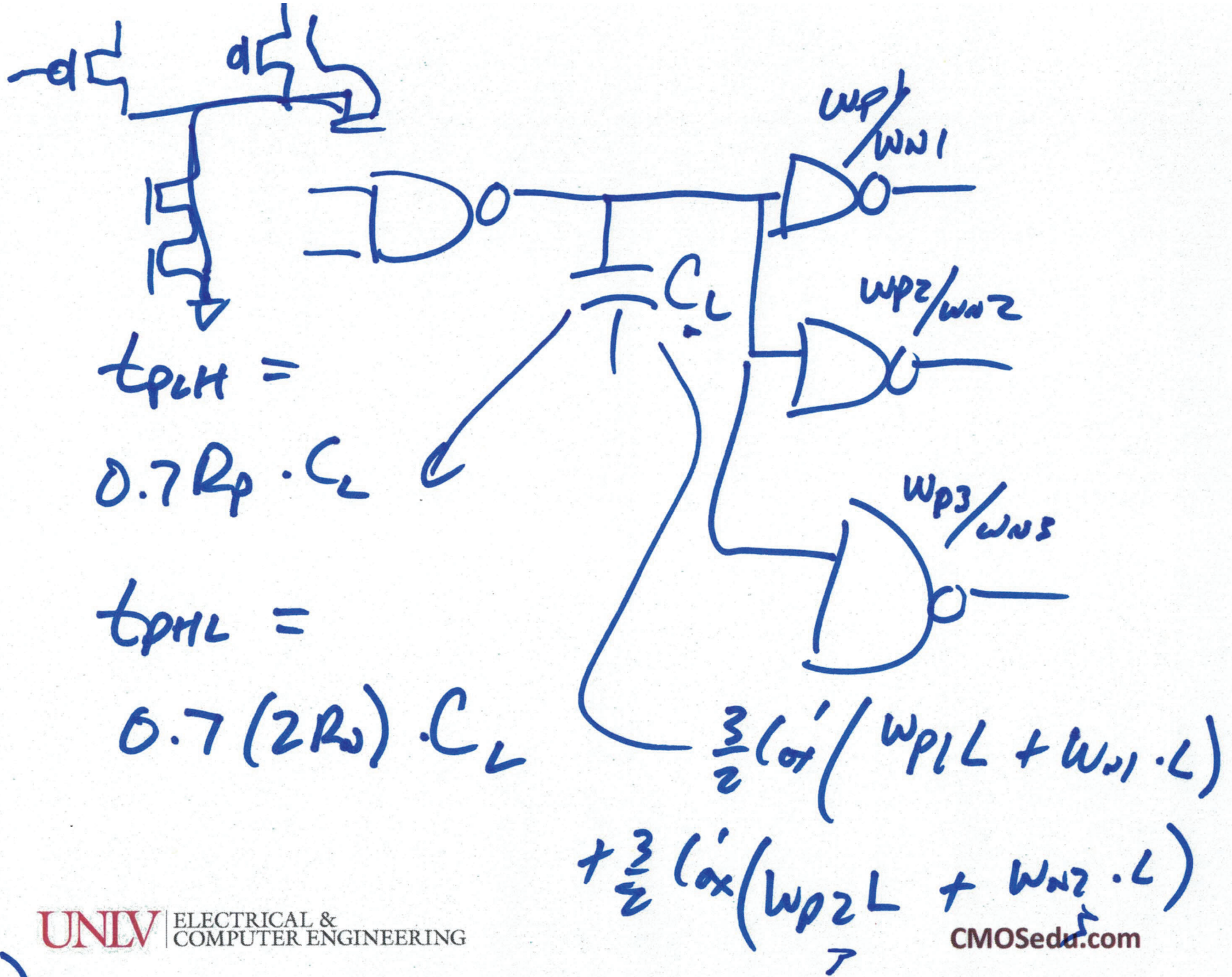
$$t_{pHL} + t_{pLH} = 20N$$

$$1MHz \rightarrow 1\mu s$$

$$f_{osc} = \frac{1}{N(t_{pHL} + t_{pLH})} = 1MHz$$

$$N \cdot (20NS) = 1\mu s$$

$$N = 50$$



3)