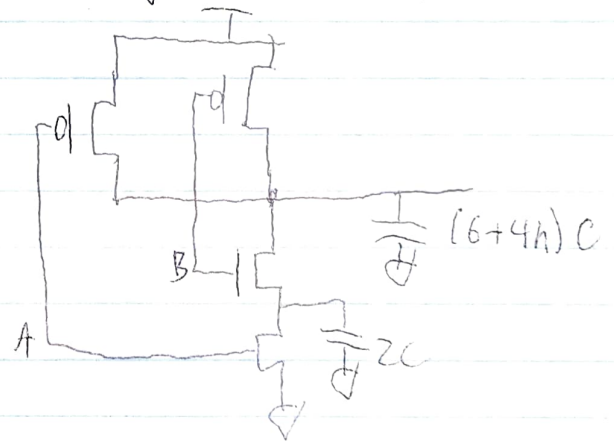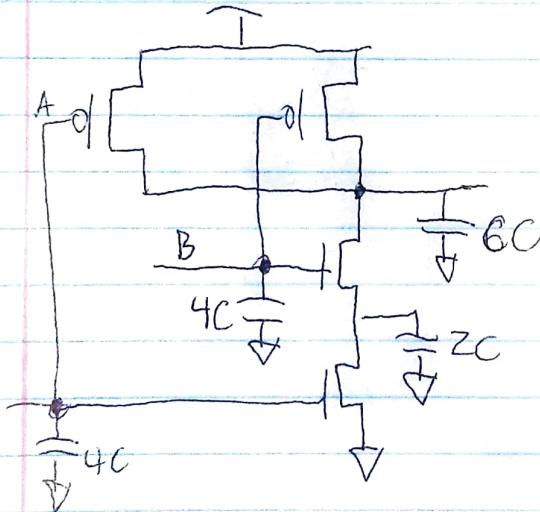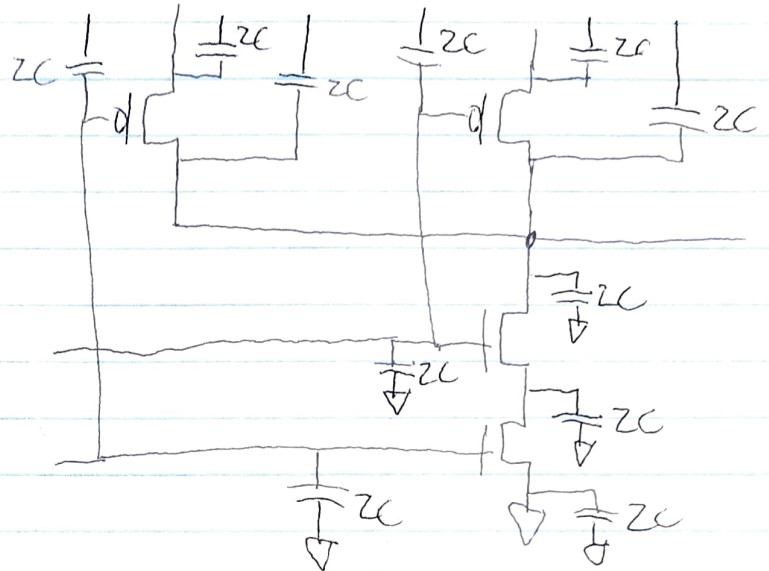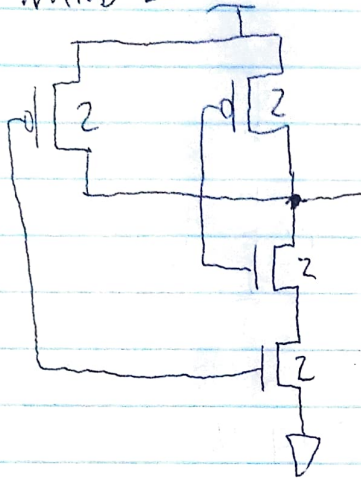Sam Sylvester

VLSI Design 1

NAND 2
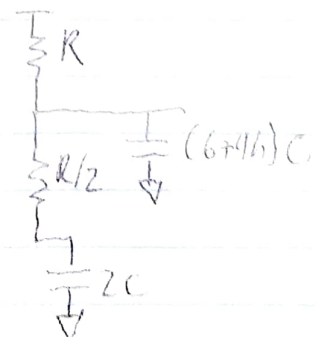

Case AB

Case 00

$$t = \frac{1}{2}(6+4h)RC$$
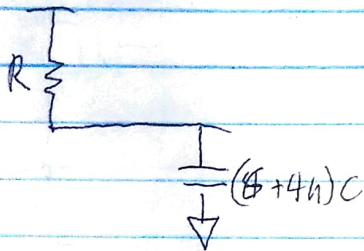$$= (3+2h)RC$$

Case 01
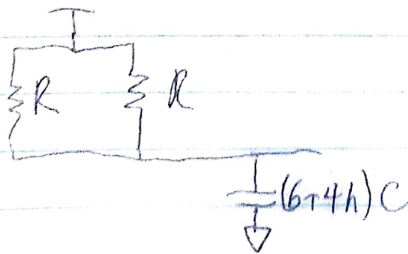
$$t = R(6+4h)C + R2C$$
$$= (8+4h)RC$$
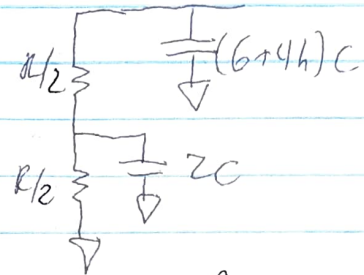
Case 10

$$t = (6+4h)RC$$

$$t_{pdr} = (8+4h)\,RC$$
$$t_{pdf} = (7+4h)\,RC$$

$$t_{cdr} = (3+2h)\,RC$$
$$t_{cdf} = (7+4h)\,RC$$

Case 11

$$t = R(6+4h)C + \frac{R}{2}(2C)$$
$$= (7+4h)RC$$

Using $h=0$, $R = 10\,k\Omega\cdot\mu m$, $C = 2fF/\mu m$
$$3RC = 60\,ps$$
$$RC = 20\,ps$$

$$t_{pdr} = 160\,ps \qquad t_{pdf} = 140\,ps$$

$$t_{cdr} = 60\,ps \qquad t_{pdf} = 140\,ps$$