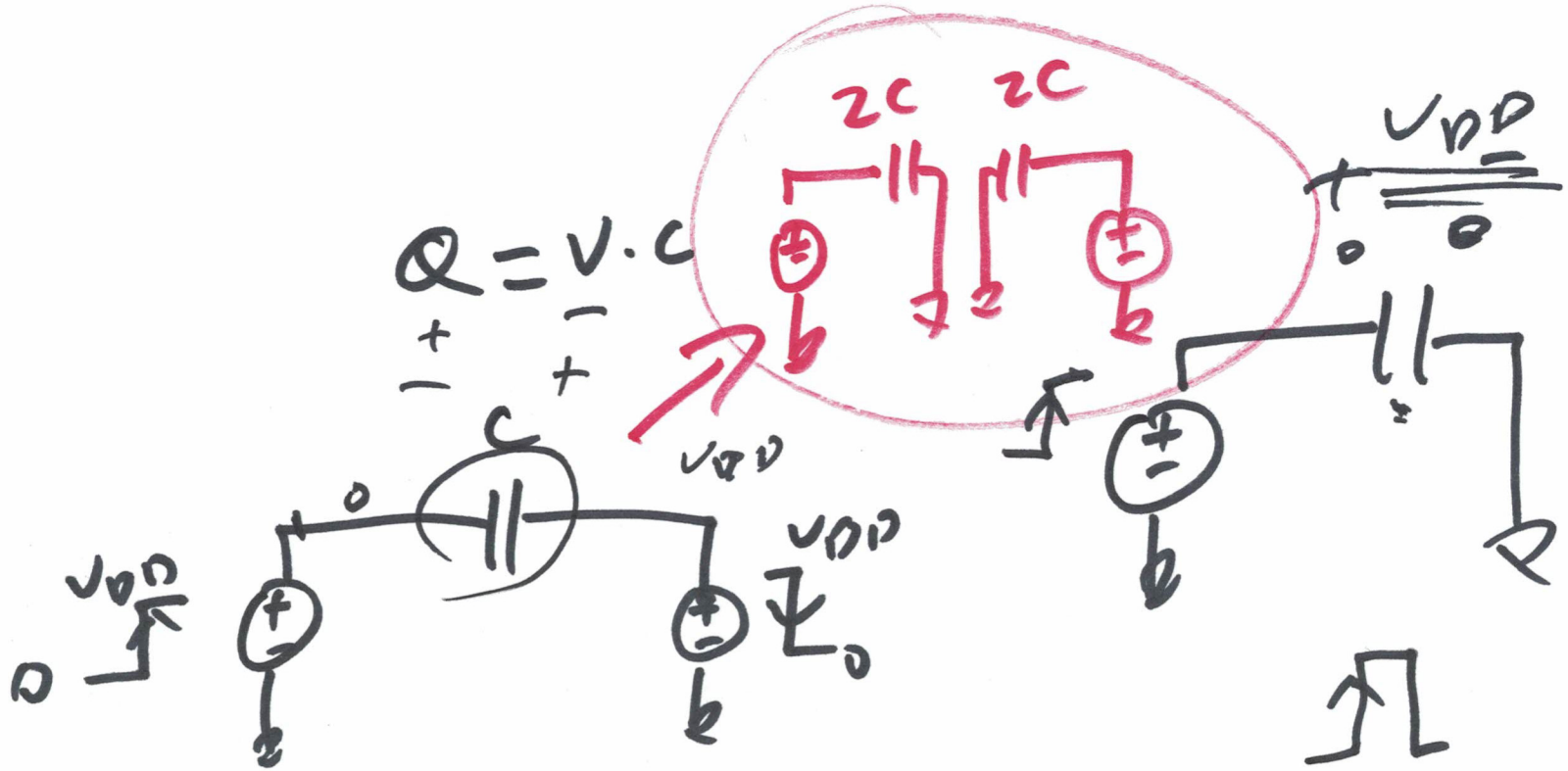
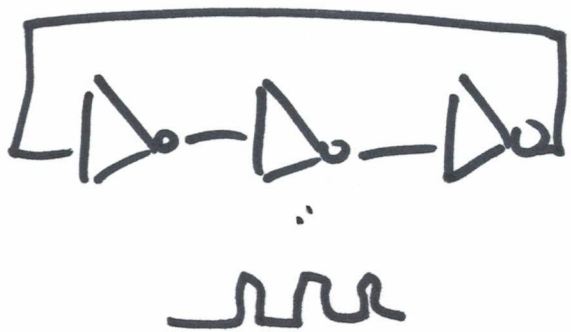


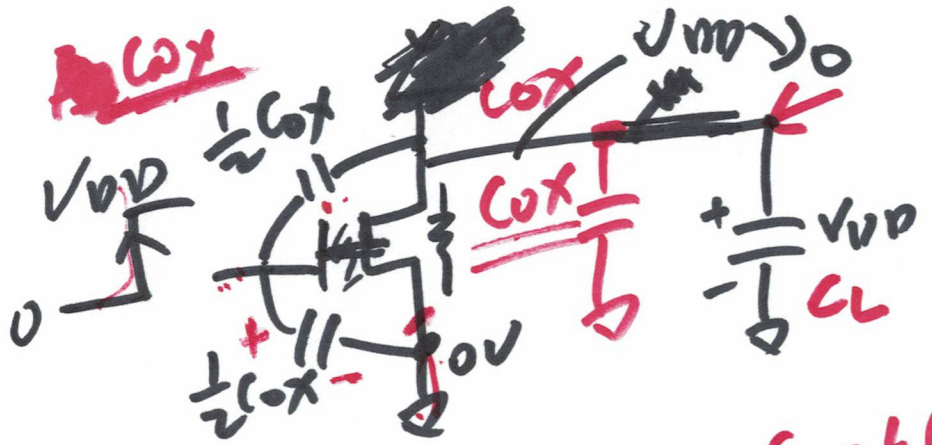
$\Delta Q = VC$

$= 2Vdd \cdot C$

$\frac{\Delta Q}{Vdd} = 2C$

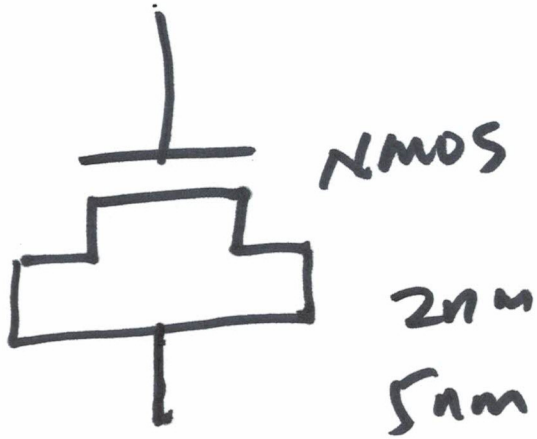
Miller Effect

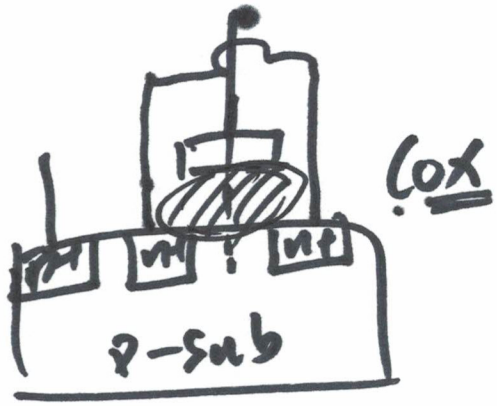


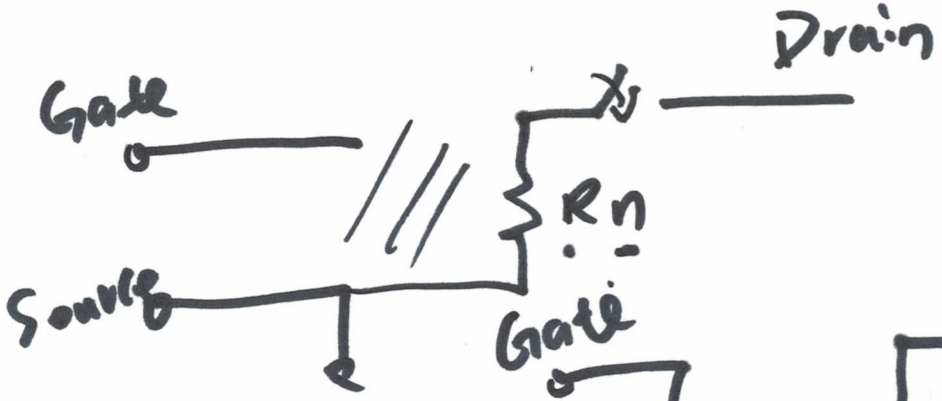


$C_{out} = C_{ox} + C_L$

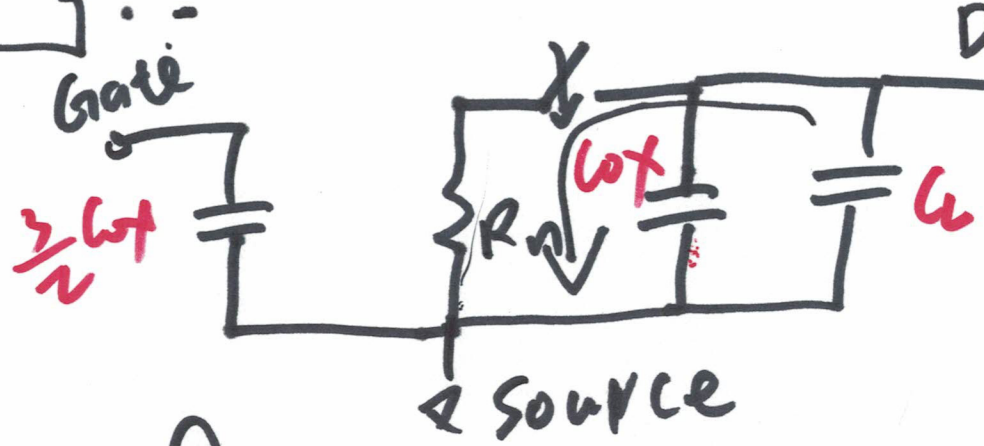
$C_{in} = \frac{3}{2} C_{ox}$

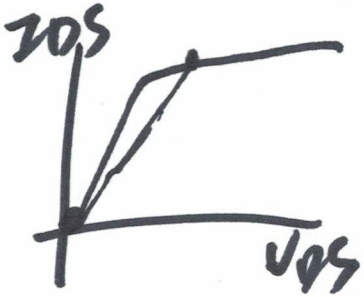


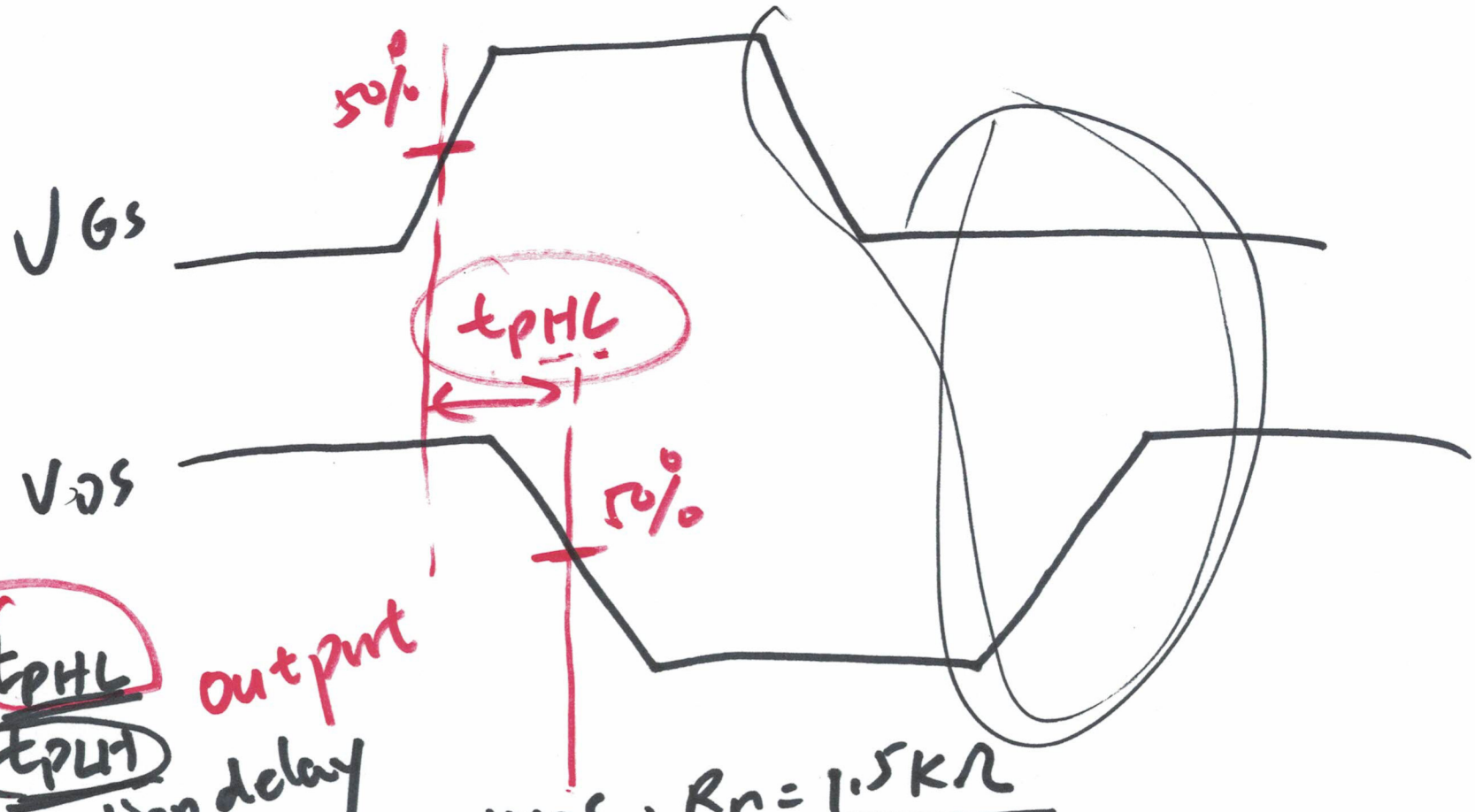




$0.7 \cdot R_n C_{tot}$



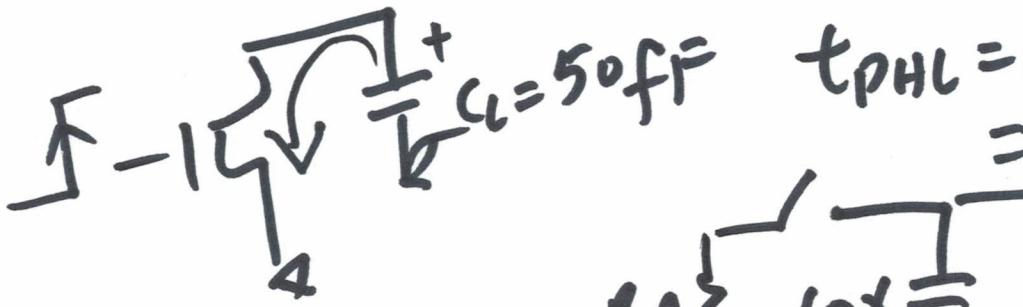




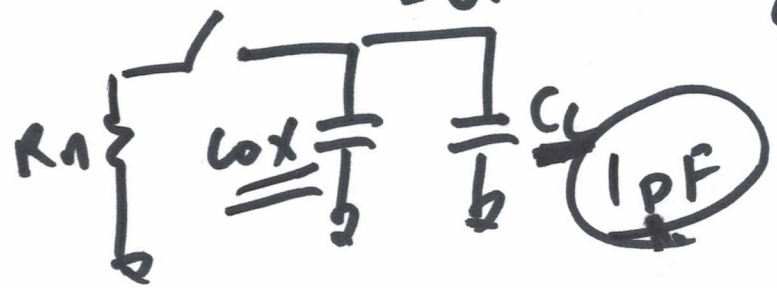
t_{PHL}
t_{PLH}
propagation delay

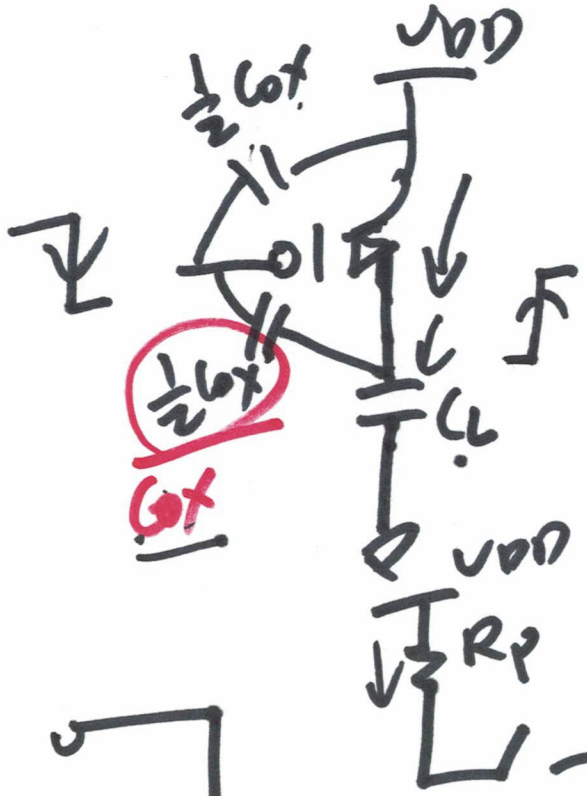
Low
High

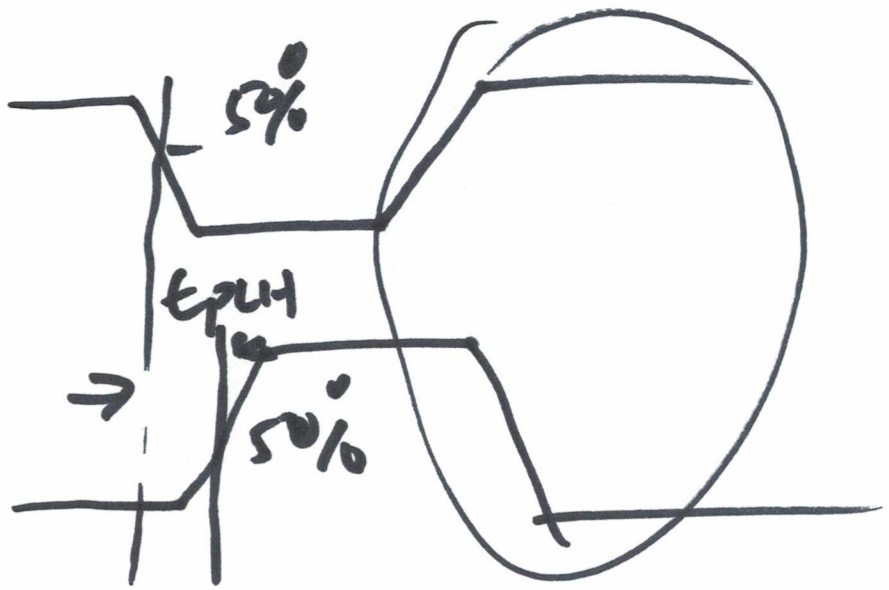
NMOS : $R_n = 1.5k\Omega$
$C_{oxn} = 17.5fF$

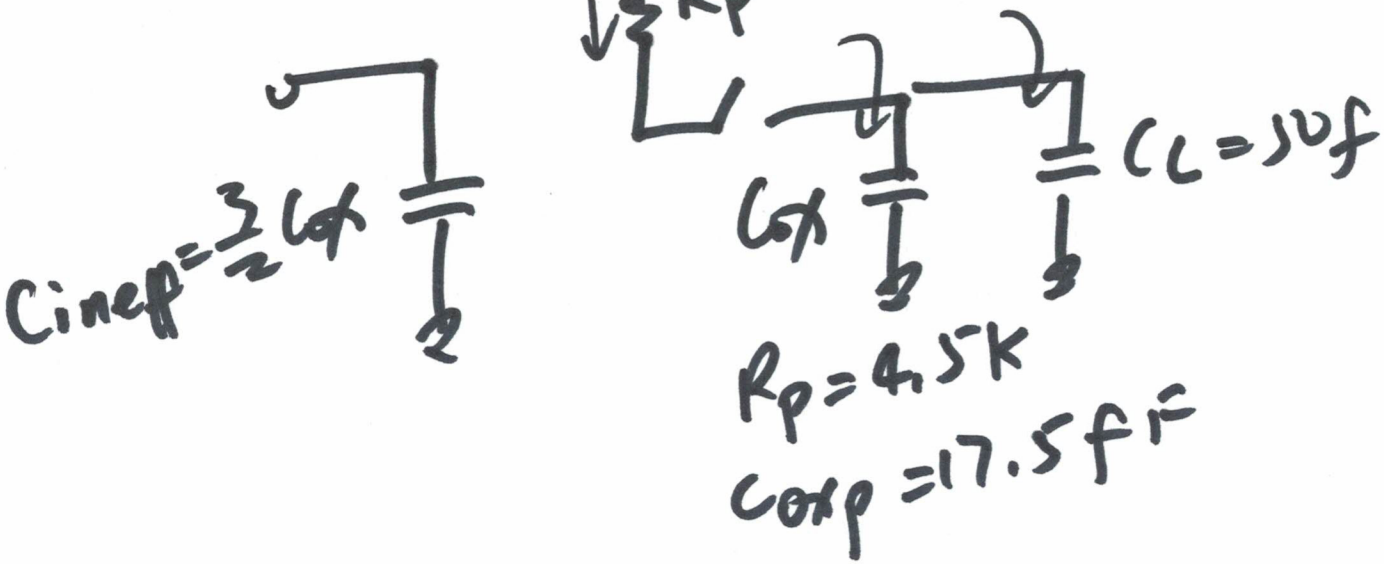


$t_{PHL} = 0.7 R_n C_{tot}$
$= 0.7 \cdot 1.5k\Omega \cdot (17.5fF + 50fF)$



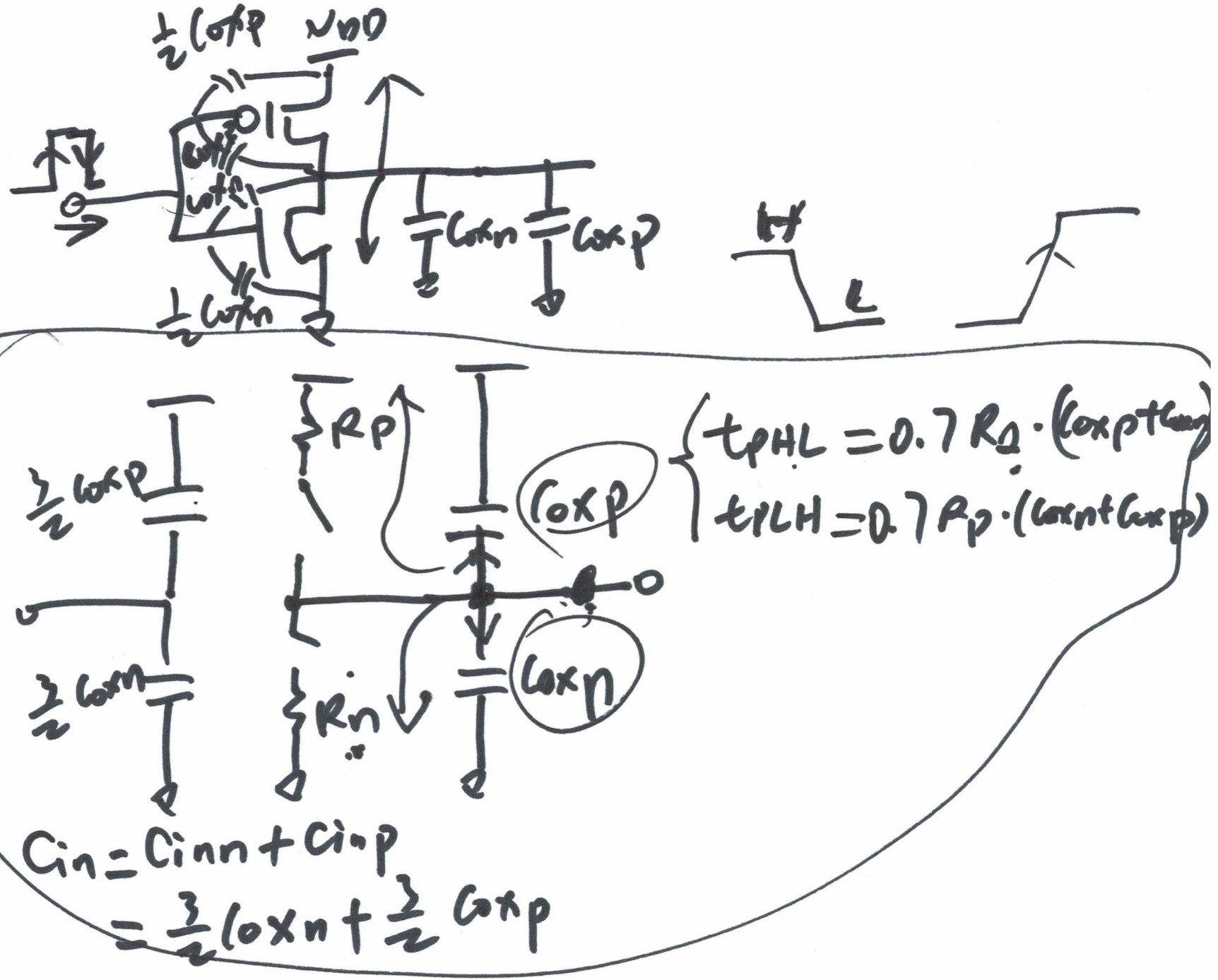






$$t_{PLH} = 0.7 R_p \cdot (C_{orp} + C_L)$$

$$= 0.7 \times 4.5K \, (17.5f + 50f)$$


½ Coxp
VDD
½ Coxn
Coxn
Coxp
RP
Rn
½ Coxp
½ Coxn
Coxp
Coxn
{tpHL = 0.7 RΩ · (Coxp + Cwn)
tpLH = 0.7 Rp · (Coxn + Cwp)
Cin = Cinn + Cinp
= 3/2 Coxn + 3/2 Coxp