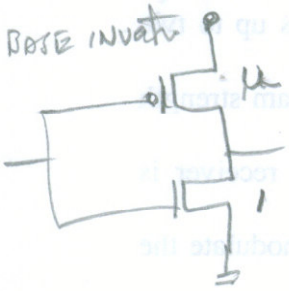
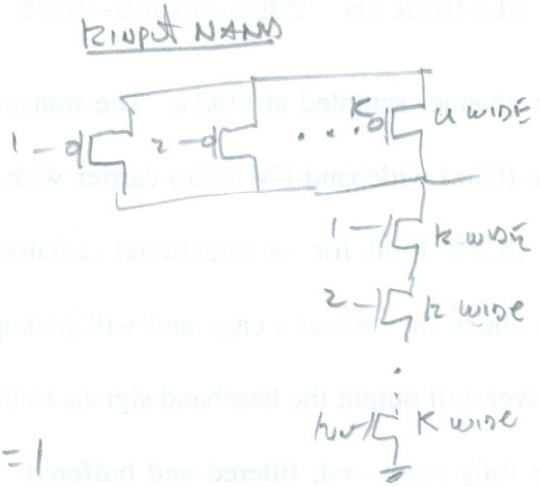
HW2

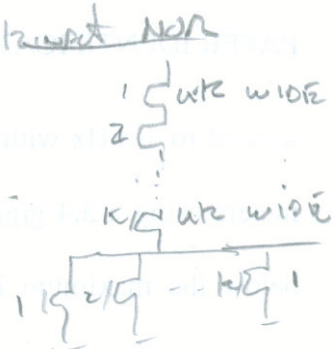
2b PROB 4.20



$$\text{logical effort of inverter} = \frac{u+1}{u+1} = 1$$



$$\text{logic effort}_{\text{NAND}} = \frac{u+k}{u+1}$$



$$\text{logical effort}_{\text{NOR}} = \frac{uk+1}{u+1}$$

AS $u \uparrow$ logic effort of NAND ≈ 1

AS $u \uparrow$ " " " NOR $= k$

hence NAND is better

HW2

2c PROB 4.27

$V_{DD} = .9V$

$Freq = 450\ MHz$

ACTIVITY FACTOR $\alpha = .1$

switching cap $= 150pF/mm^2$

$$\text{TOTAL CAPACITANCE} = 150pF/mm^2 \cdot 70mm^2 = 10500pF$$

$$P = \alpha C_{TOT} V_{DD}^2 (Freq) = .1\left(10.5 \times 10^{-9}\right)(.9)^2\left(450 \times 10^6\right)$$

$$P = 382.725 \text{ mWatts}$$