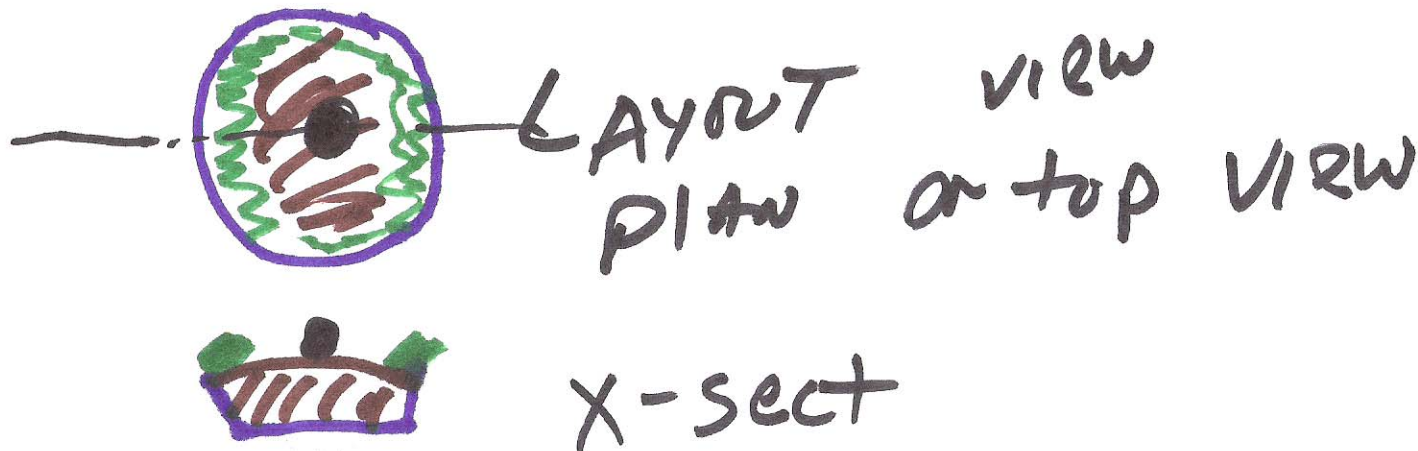


EE 421 / ECG 621

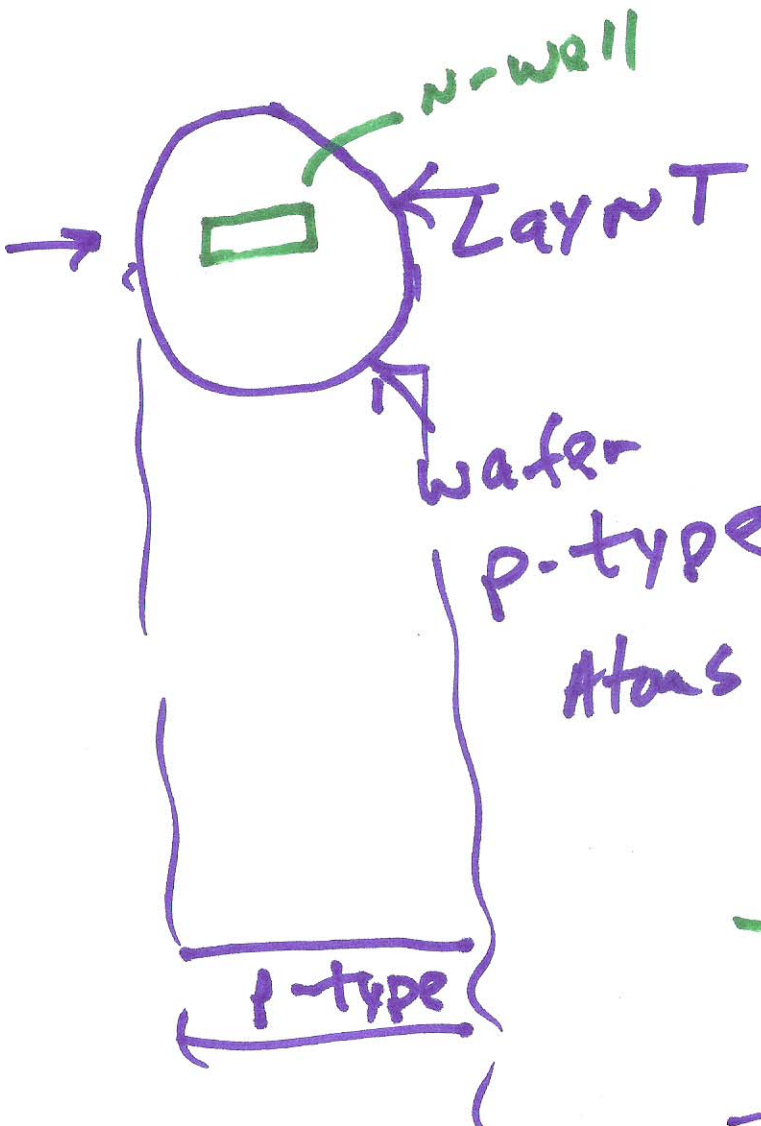
9/3/2014

Lecture 3

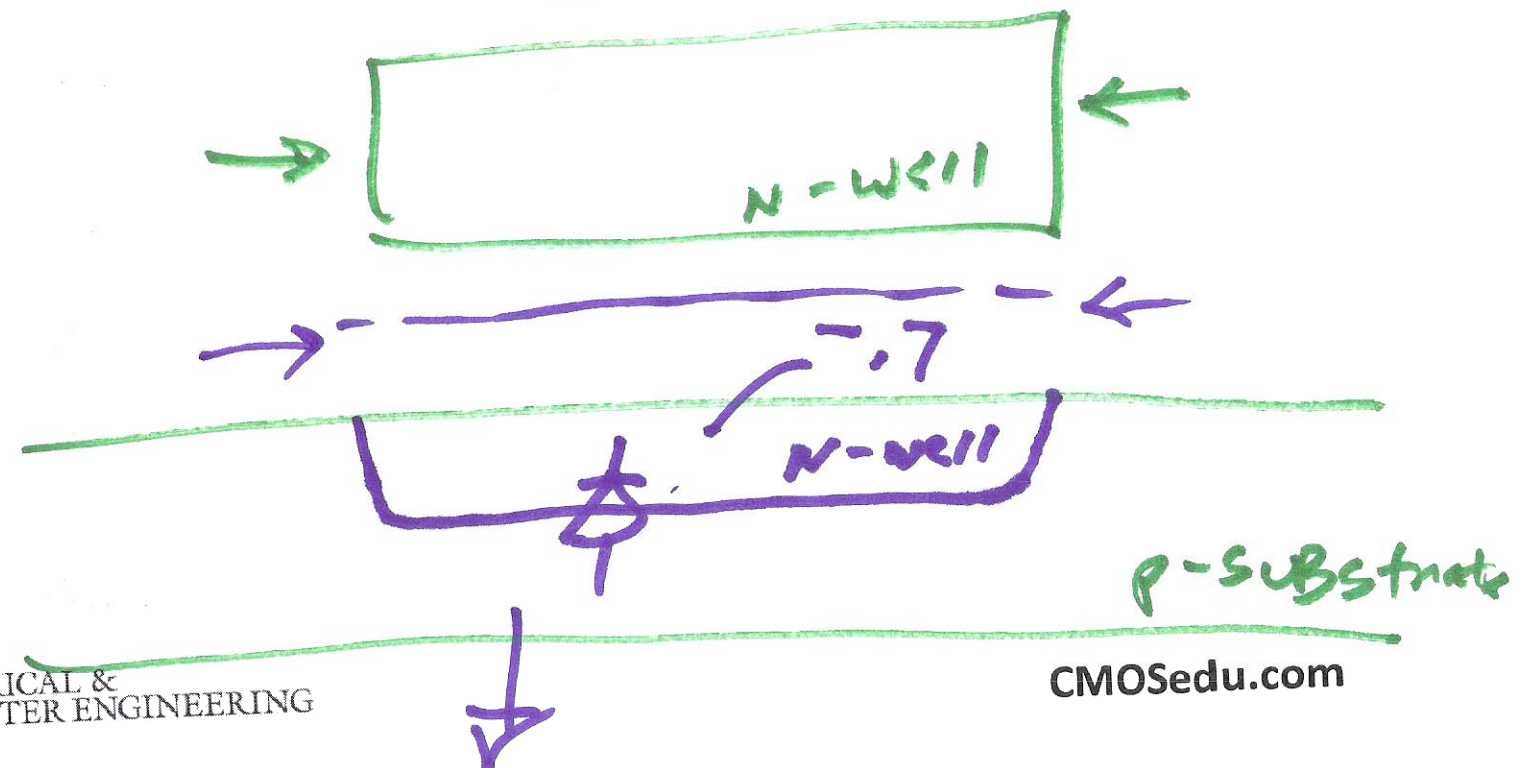
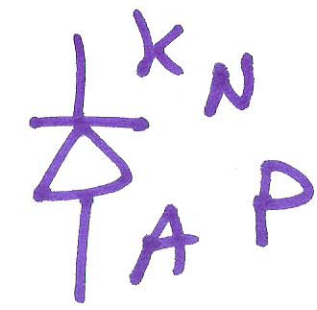
2.1 patterning the n-well
n-well



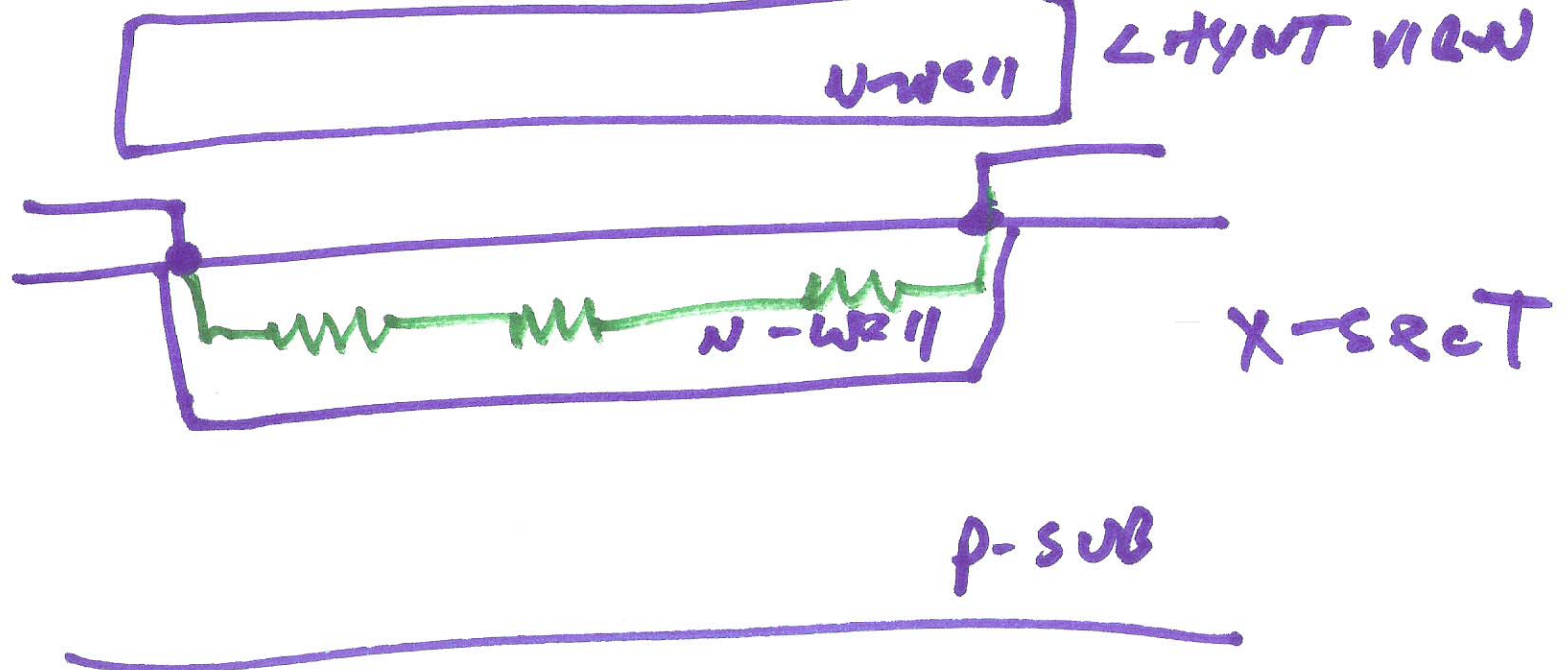
Si has 4 valence electrons



Atoms with 3 valence Borons



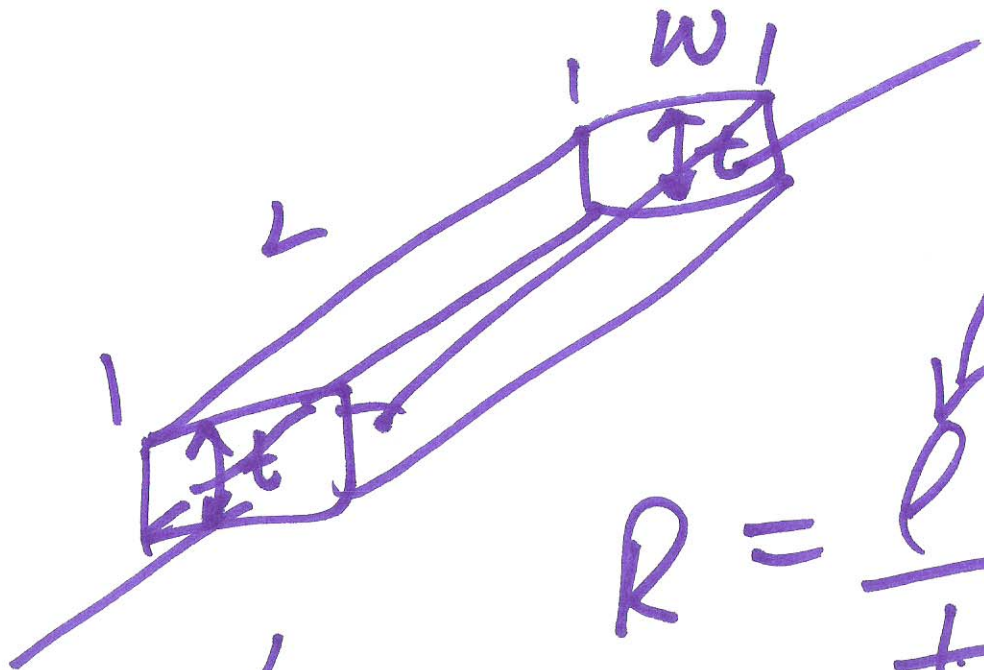
2)



3-things

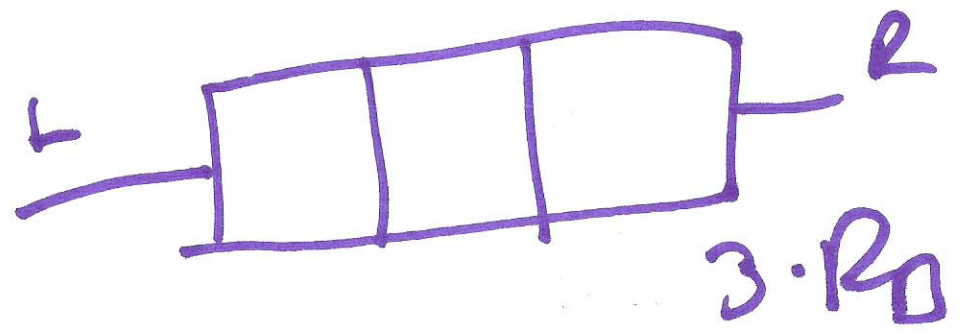
- 1) diode
- 2) resistor
- 3) body of the pmos

3)



$$R = \frac{\rho \cdot L}{t \cdot w}$$

materials resistivity ρ
 $\rho \cdot w$ distance
 t cm
 Sheet resistance



$$\frac{\Omega}{D}, R_0$$

4)

Using the C5 process
 Layout A 10K Resistor using N-well

$$R = 10K = R_{\square} \cdot \frac{L}{W} = 800 \cdot \frac{L}{W}$$

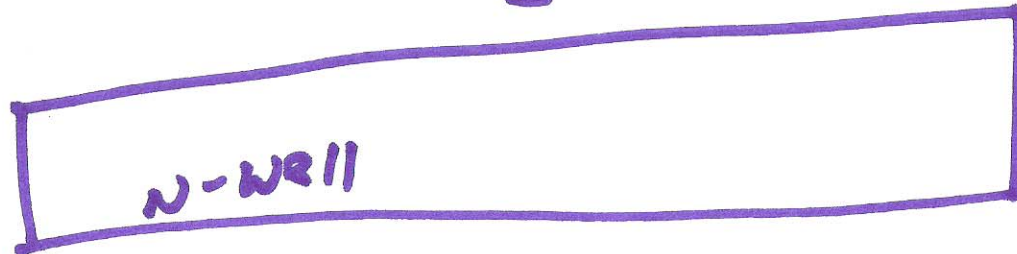
for C5

$$\lambda = 0.34 \\ = 300nm$$

$$\frac{L}{W} = 12.5$$

$$L = 3.64 \cdot 12.5 \\ = 45.5$$

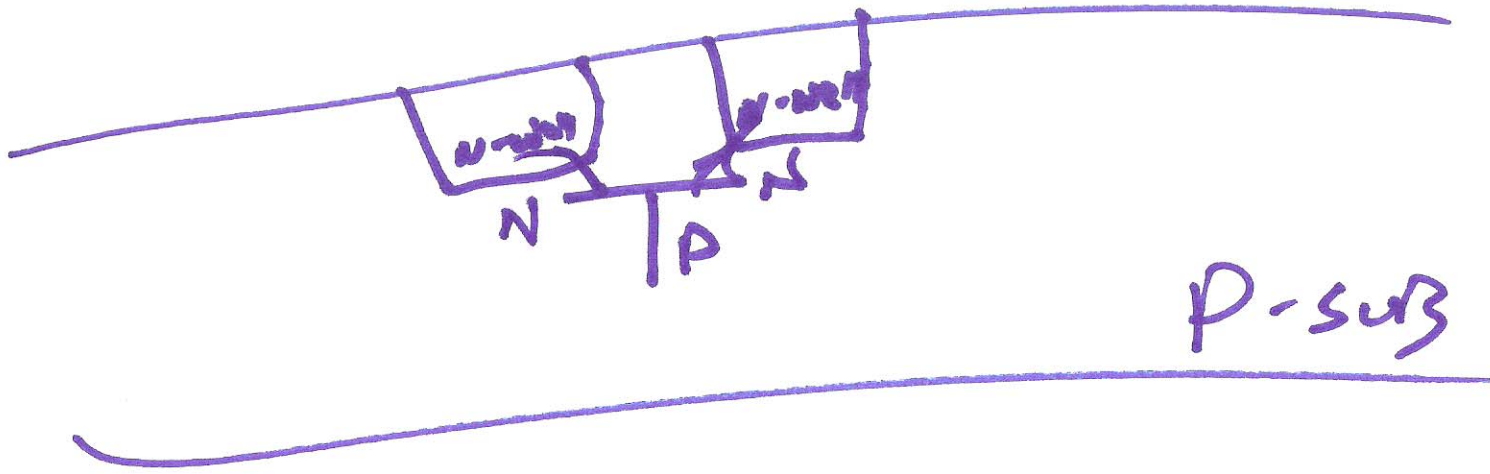
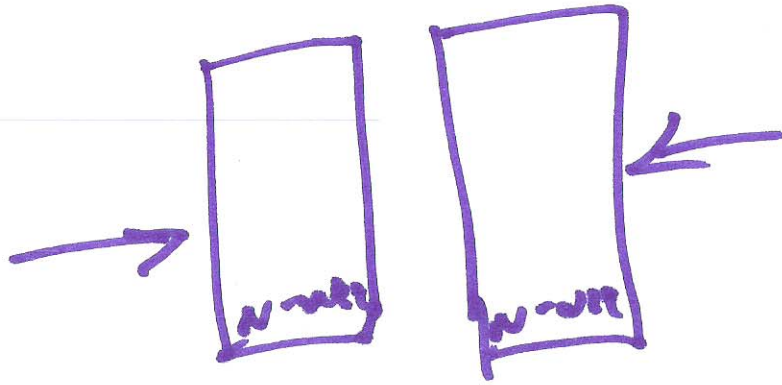
$$3.64 = W$$



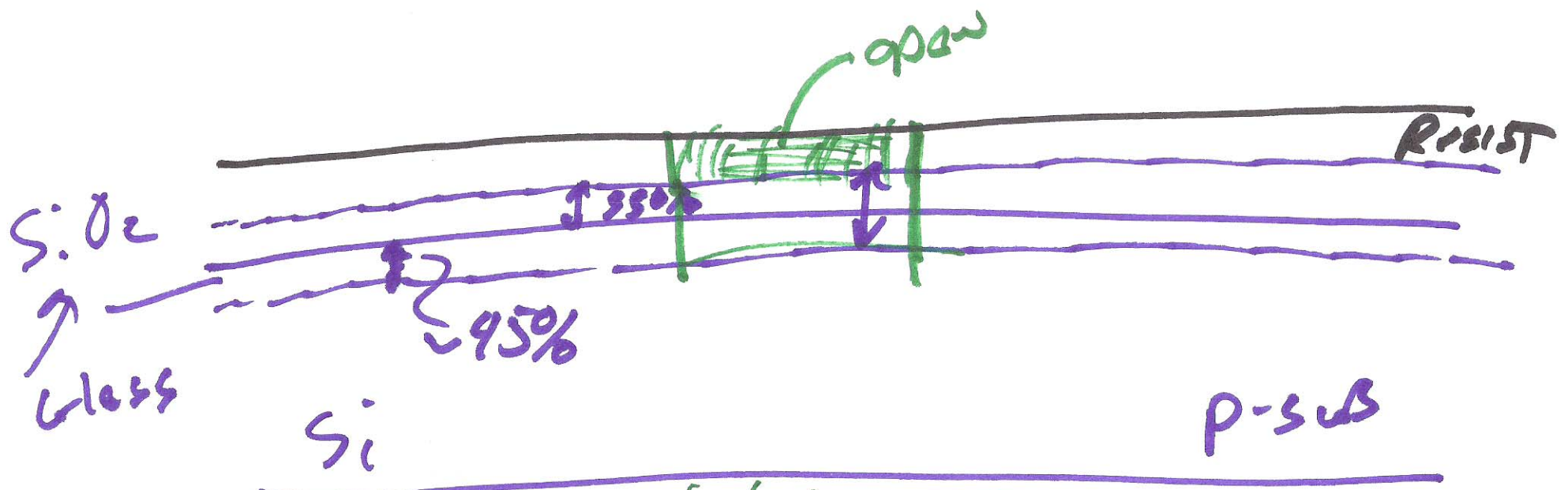
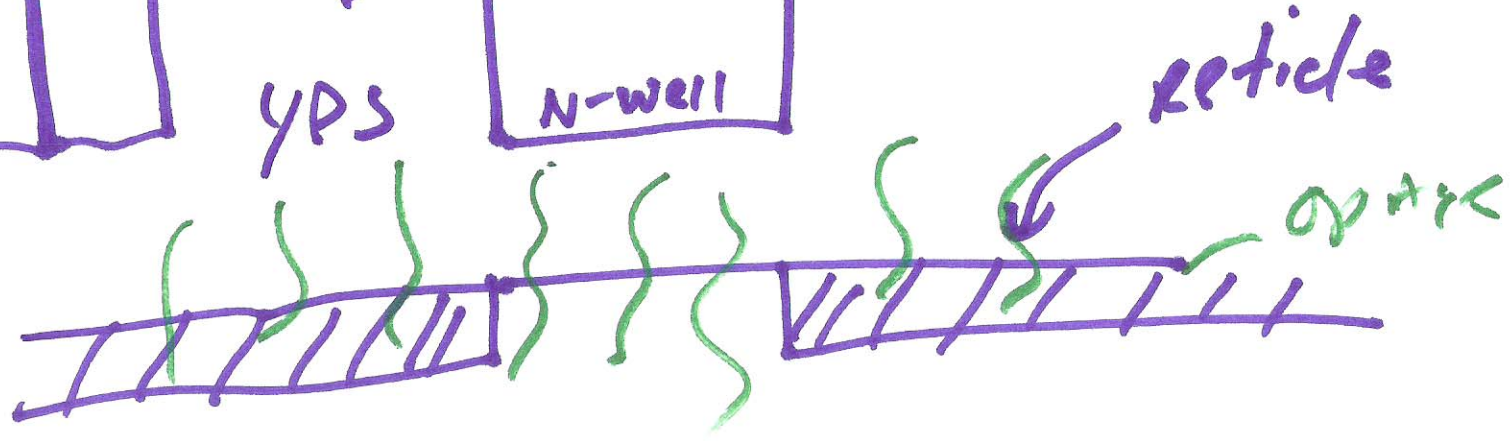
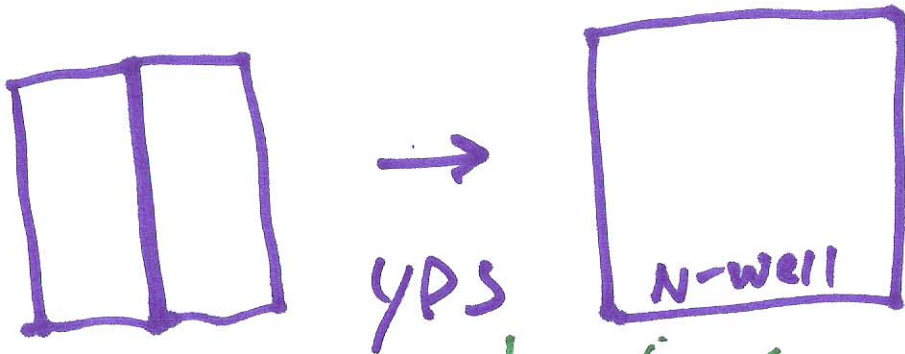
$$> 12\lambda = > 3.64$$

$$18 \cdot 300nm = 5.4\mu m$$

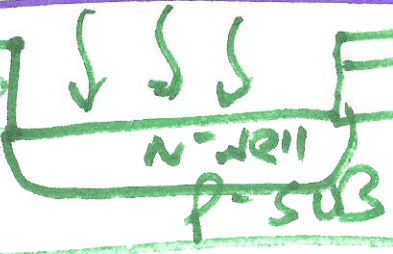
5)

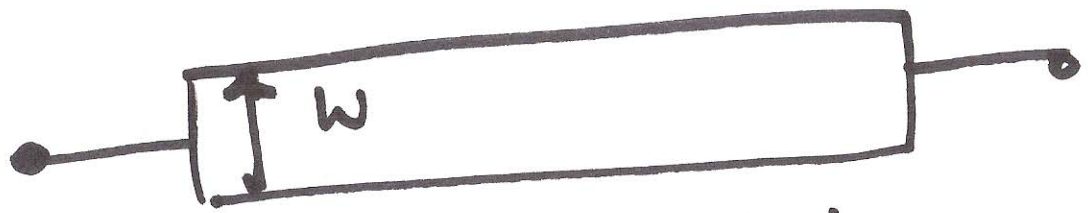
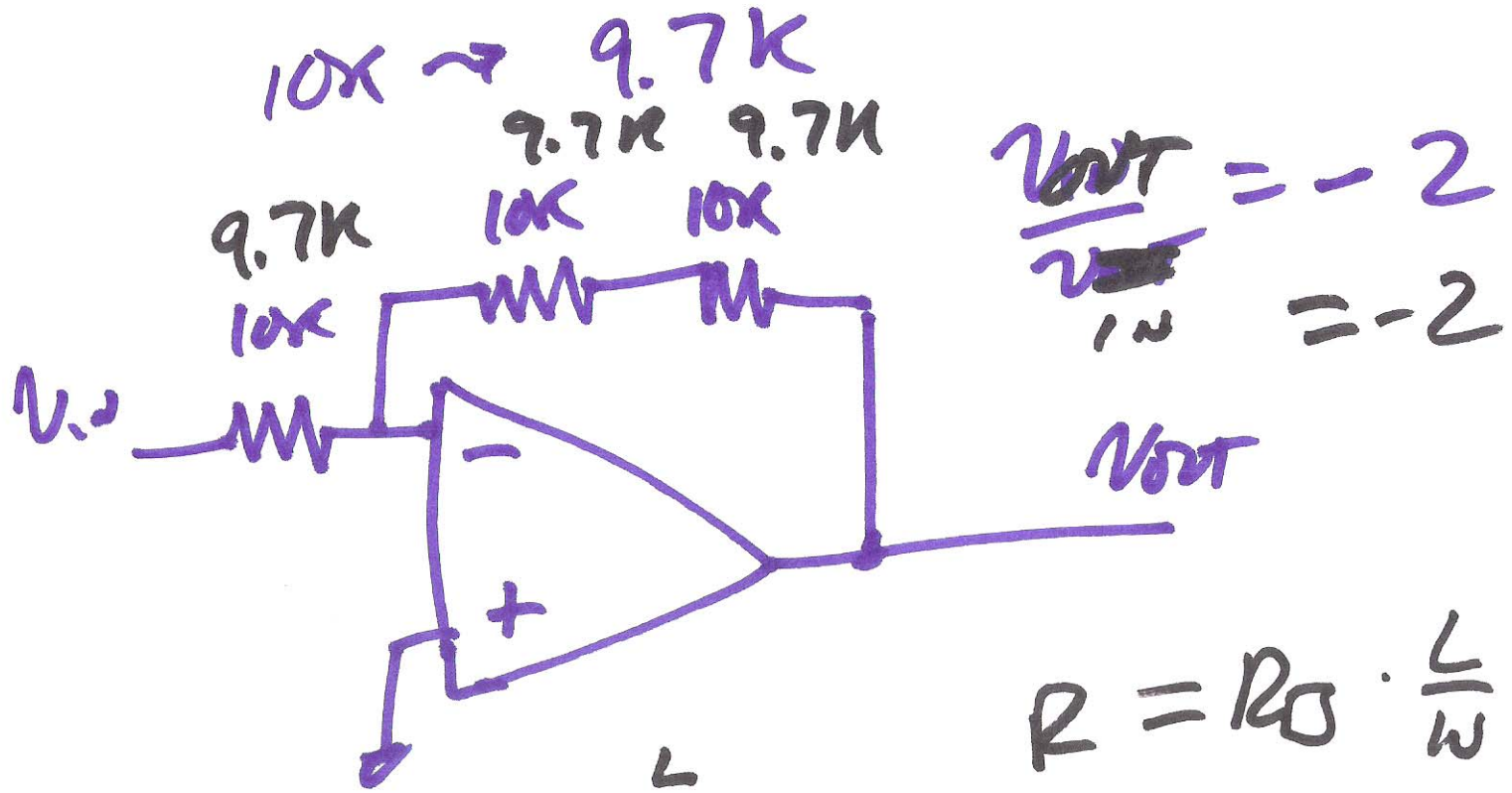


b)

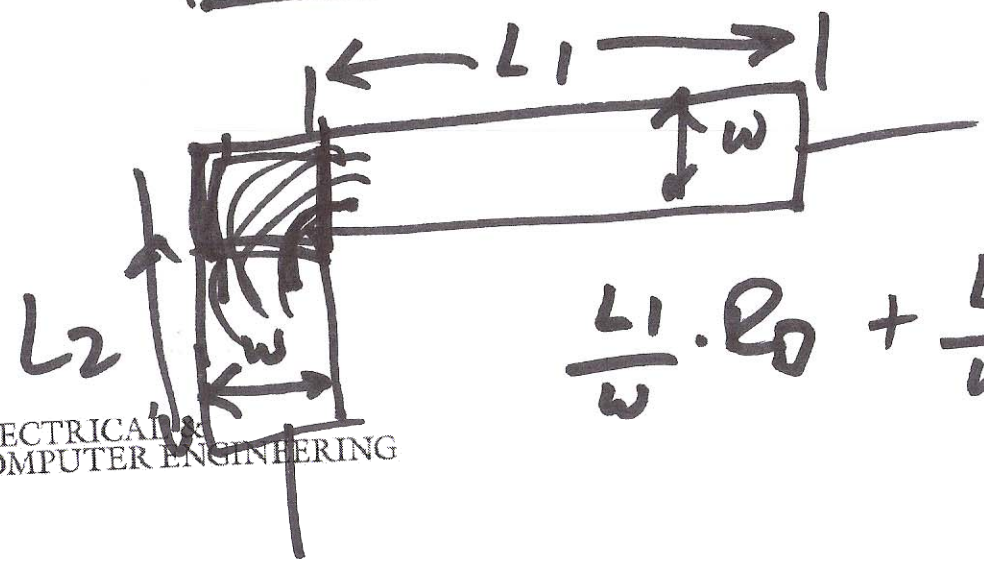


7)





$$R = R_0 \cdot \frac{L}{w}$$



$$\frac{L_1}{w} \cdot R_0 + \frac{L_2}{w} \cdot R_0 + 0.6 R_0$$

8)