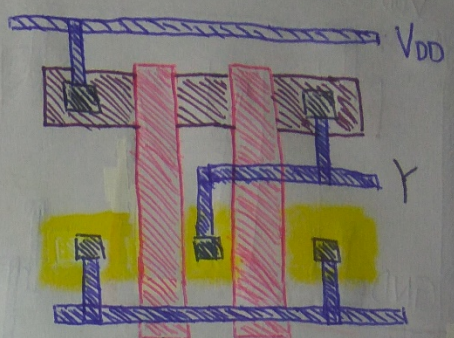
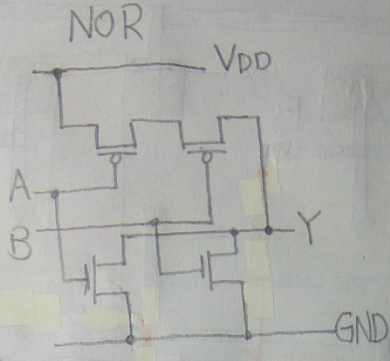
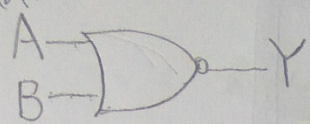


HW1

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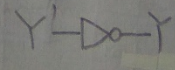
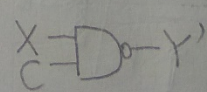
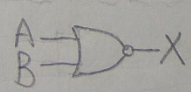
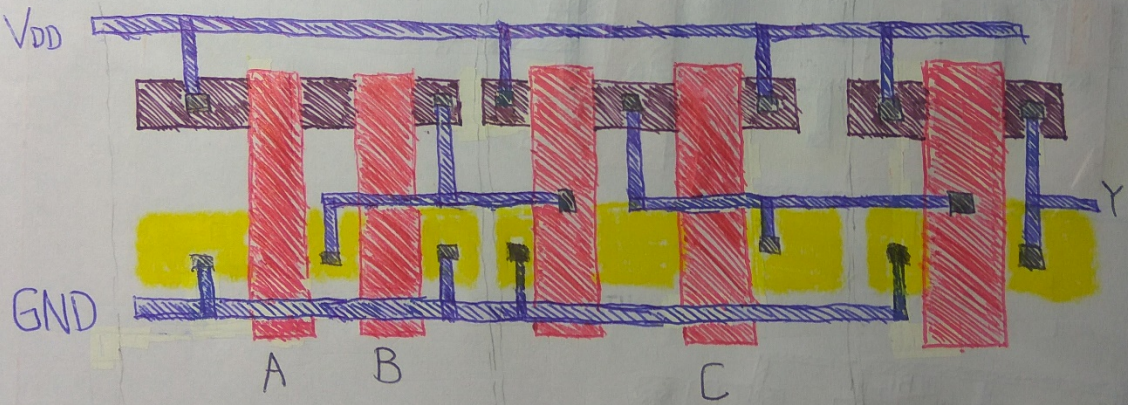
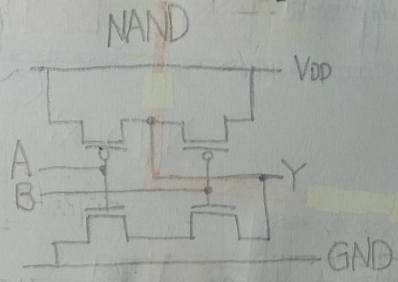
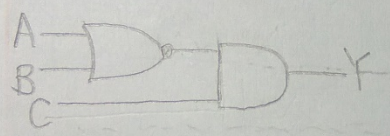
1. (a)



- metal 1
- poly
- p-diffusion
- n-diffusion
- node
- metal 2

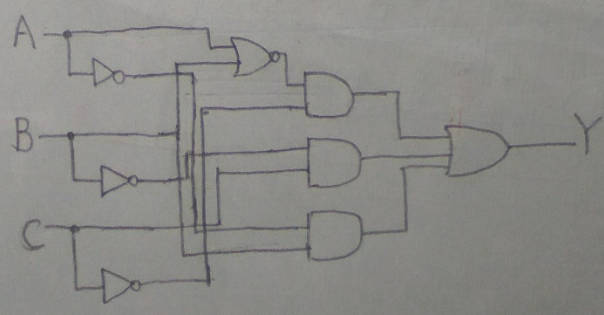
(b)

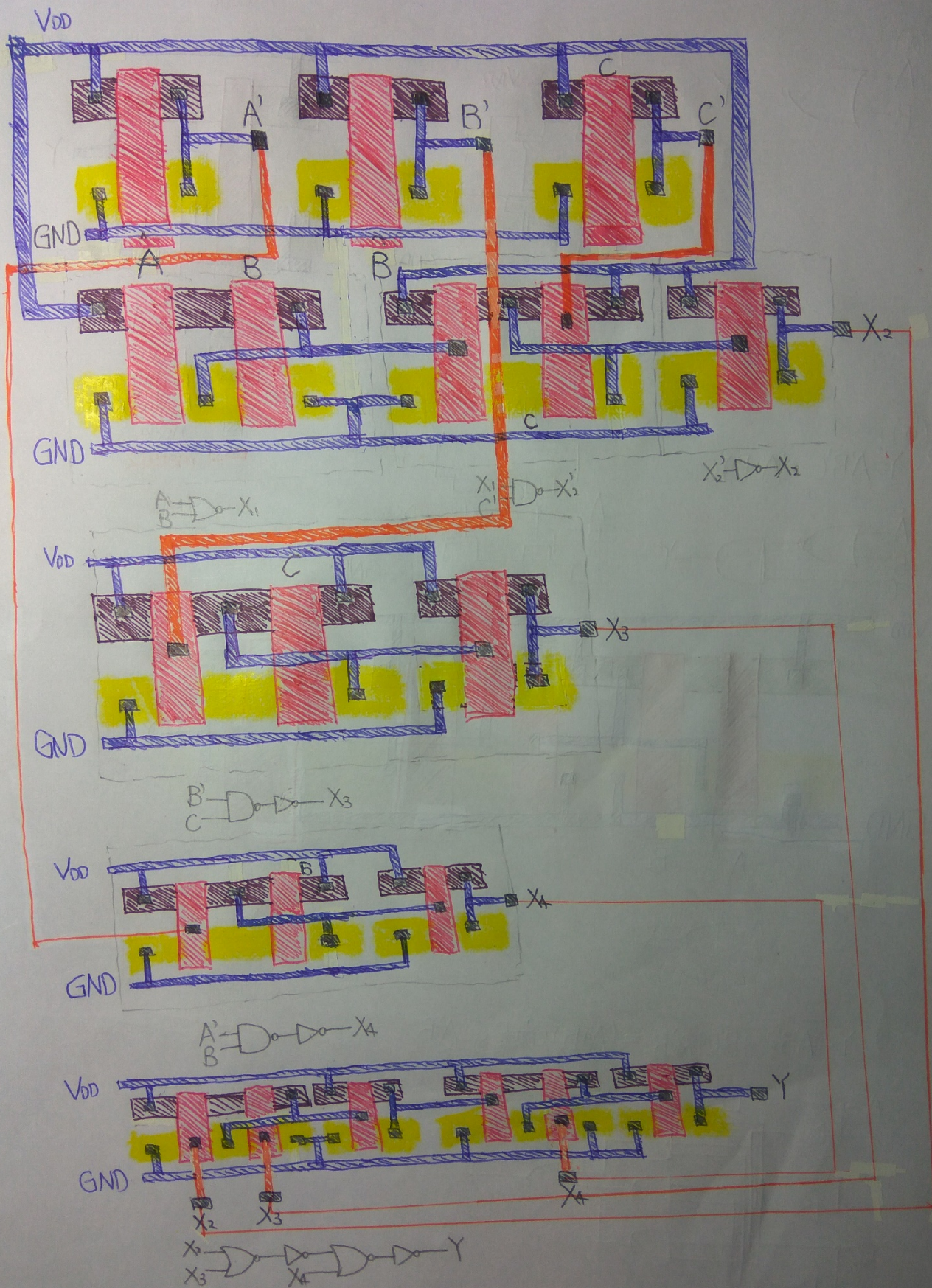
$$Y = AB'C = (A+B)'C$$



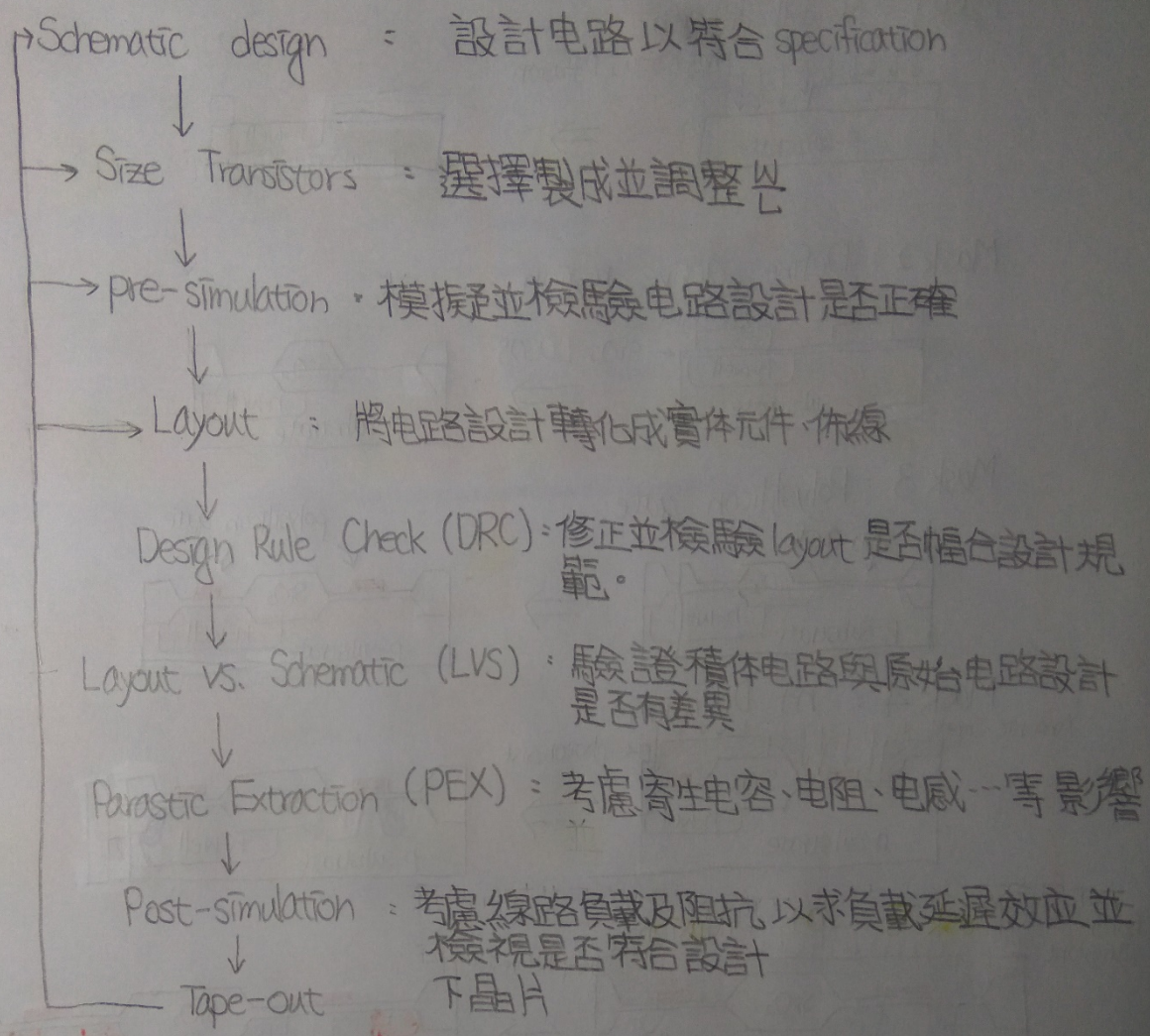
(c)

$$Y = AB'C' + B'C + A'B = (A+B)'C' + B'C + A'B$$



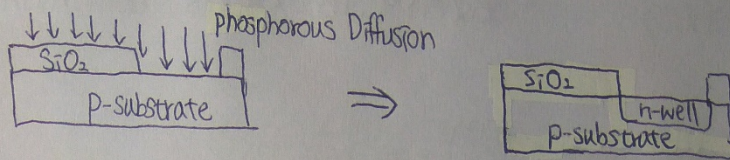


2.

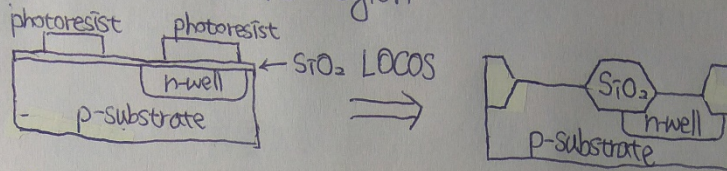


3.

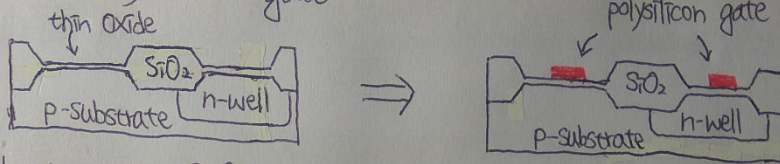
Mask 1 = N-well diffusion



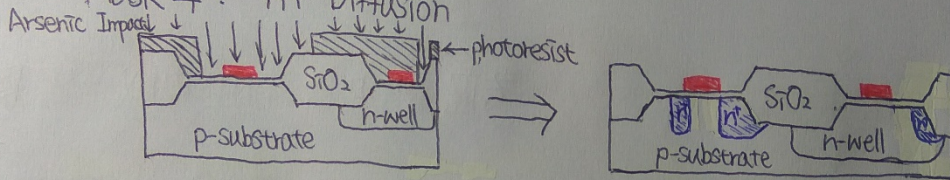
Mask 2: Define active region



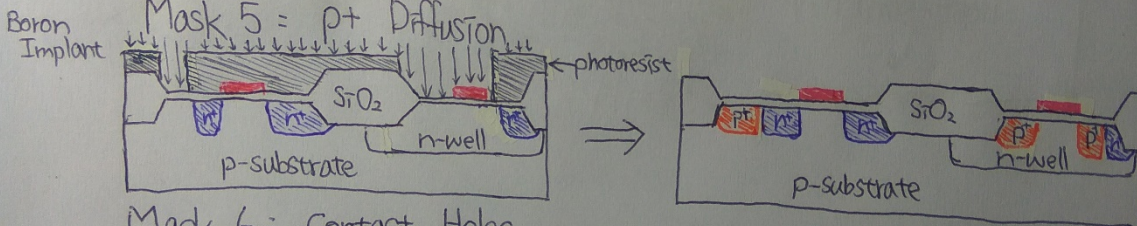
Mask 3: Polysilicon gate



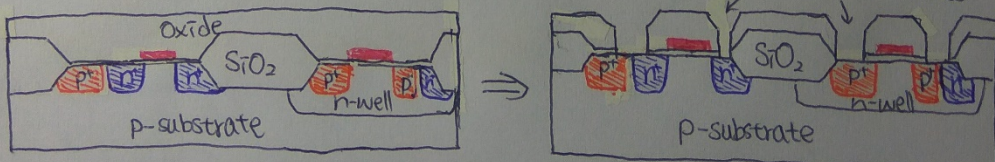
Mask 4: n+ Diffusion



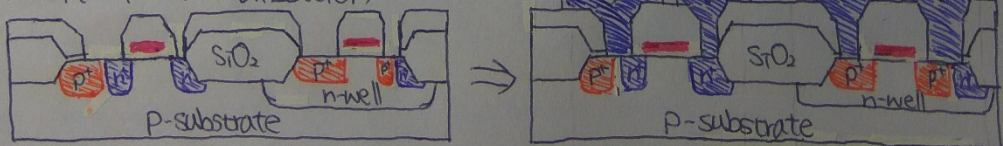
Mask 5: p+ Diffusion



Mask 6: Contact Holes



Mask 7: Metallization



Self-aligned: In Mask 4, we can see that the polysilicon gate over the NMOS transistor blocks the diffusion so the source and drain are separated by a channel under the gate. This is the self-aligned process because the source and drain of the transistor are automatically formed adjacent to the gate without precisely align the masks.