B10505047 [illegible]

Integrated Circuit Design
Homework #1
Layout Reading

Deadline: Sep. 27

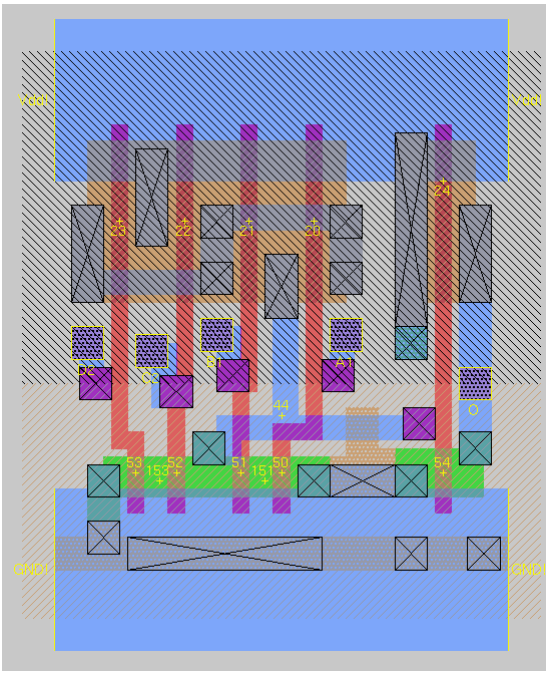
For the following layouts, please

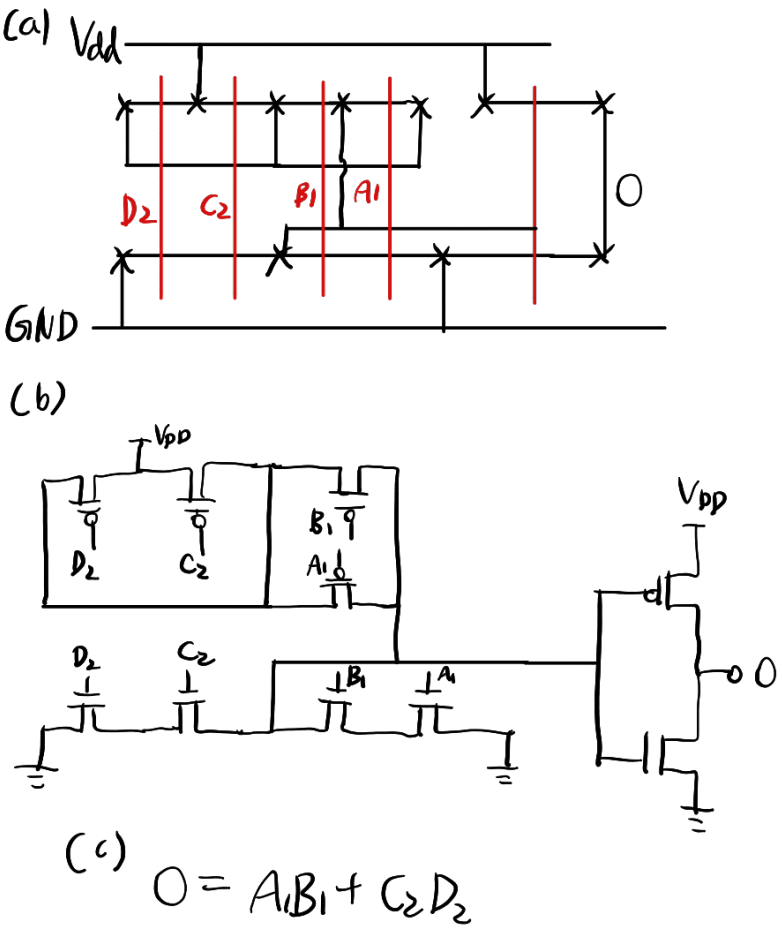
(a) Draw the associated sticky diagram.

(b) Draw the circuit in transistor level.

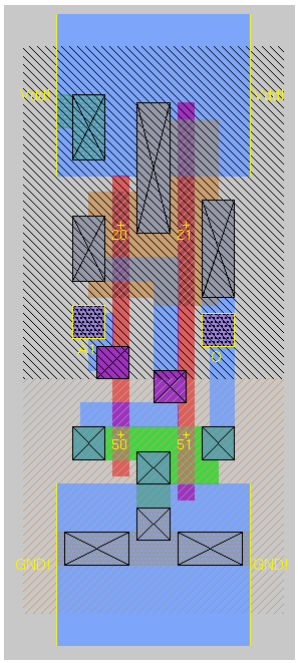
(c) Describe the function of the circuits. (You can use Boolean equations or other descriptions)

1.

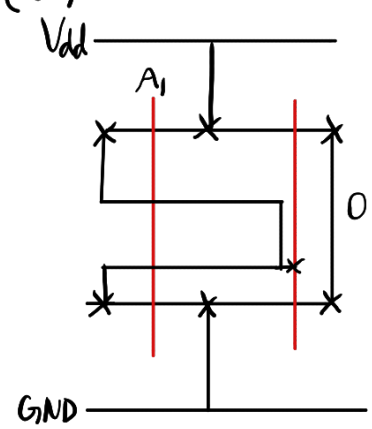




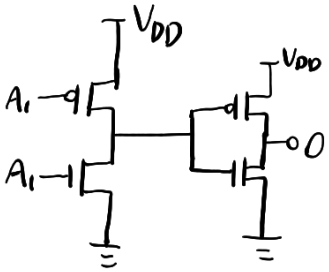
2.



(a)



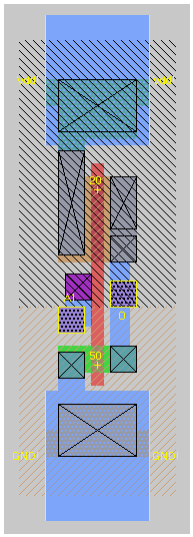
(b)



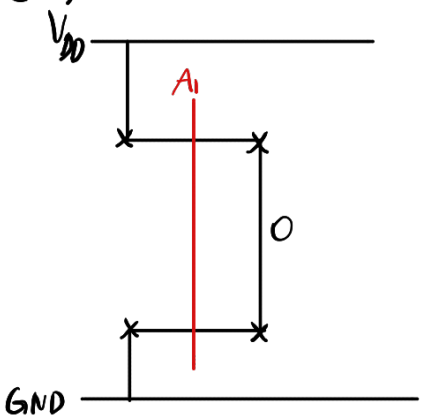
(c)

$O = A_1$

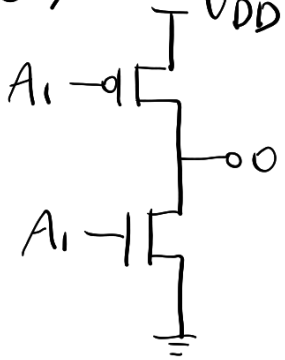
3.



(a)



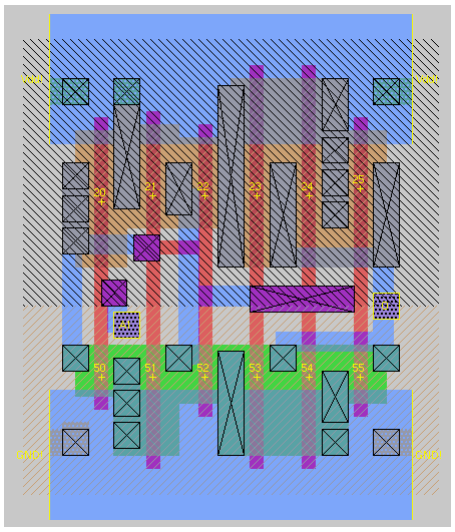
(b)

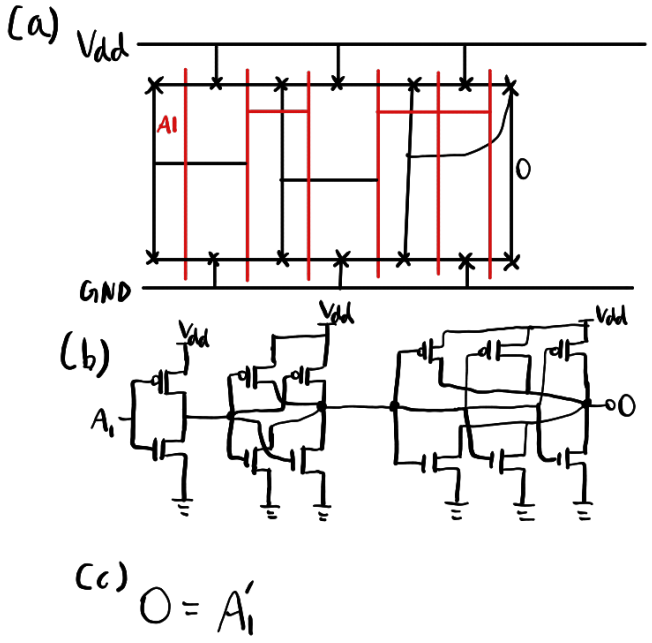


(c)

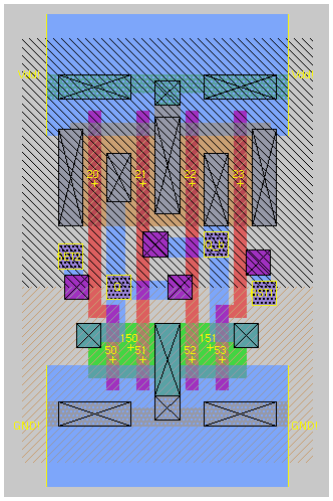
$O = A_1'$

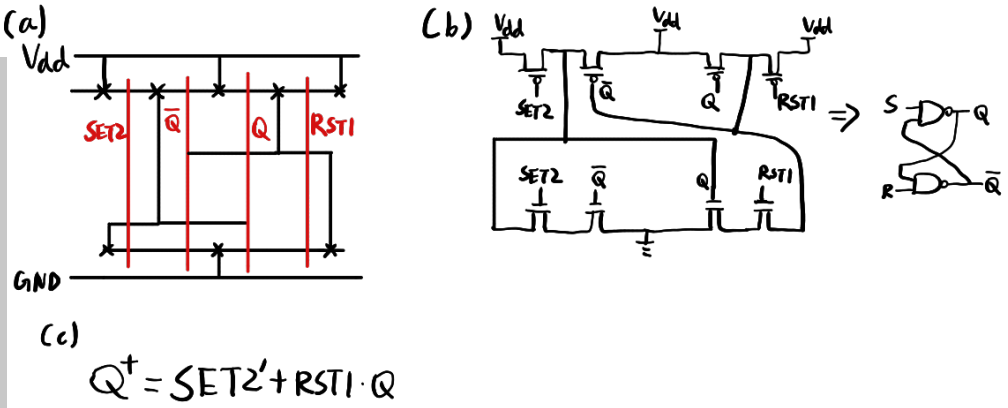
4.



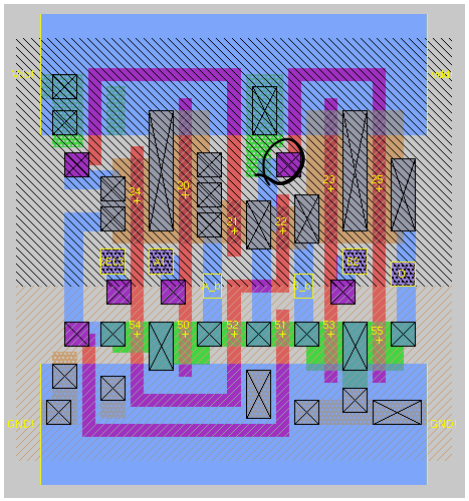

(a)
Vdd
A1
O
GND
(b)
Vdd
A1
O
(c)
O = A1'

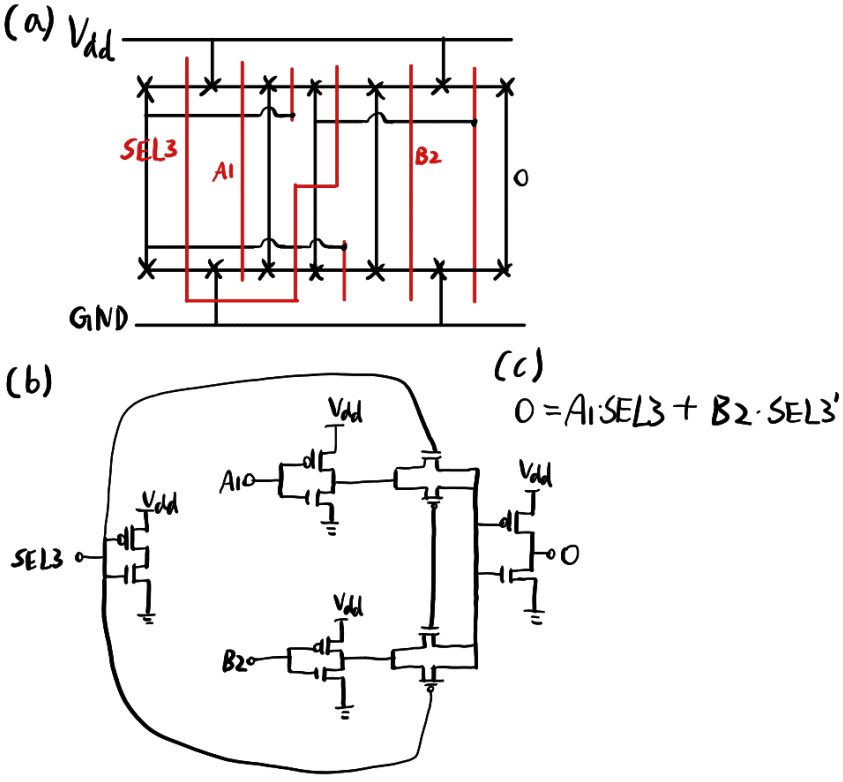
5.



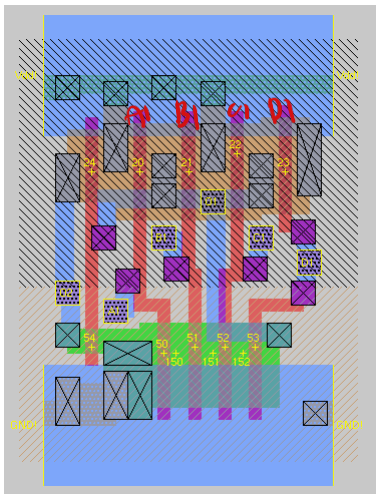

(a)
Vdd
SET2
Q̄
Q
RST1
GND
(b)
Vdd
SET2
Q̄
Q
RST1
S
Q
R
Q̄
(c)
Q+ = SET2' + RST1 · Q

6. Select

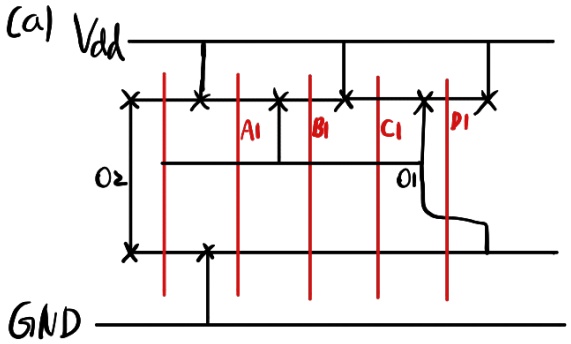



(a)
Vdd
SEL3
A1
B2
O
GND
(b)
Vdd
A1
SEL3
B2
O
(c)
O = A1·SEL3 + B2·SEL3'

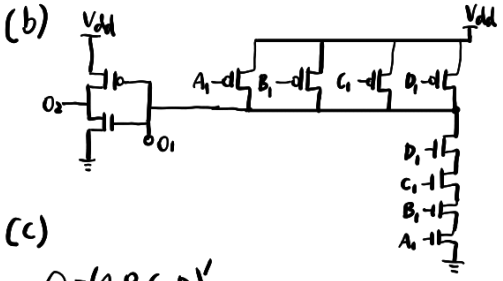
7.



(a)



(b)

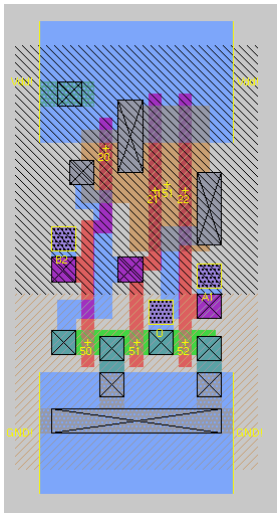


(c)

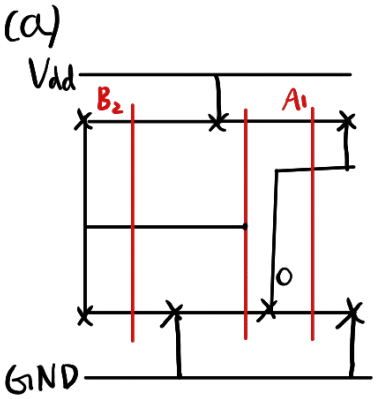
$O_1 = (A_1 B_1 C_1 D_1)'$

$O_2 = A_1 B_1 C D_1$

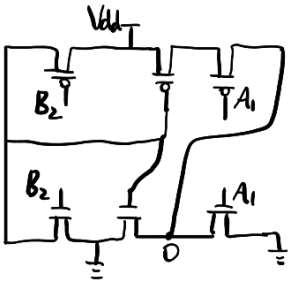
8.



(a)

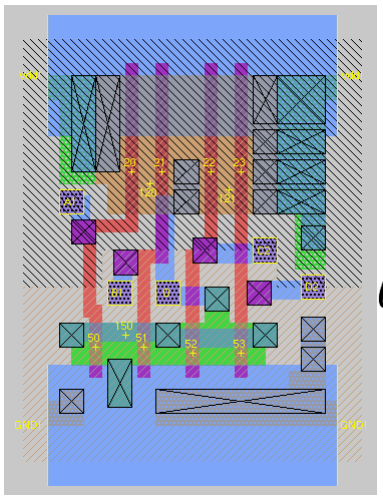


(b)

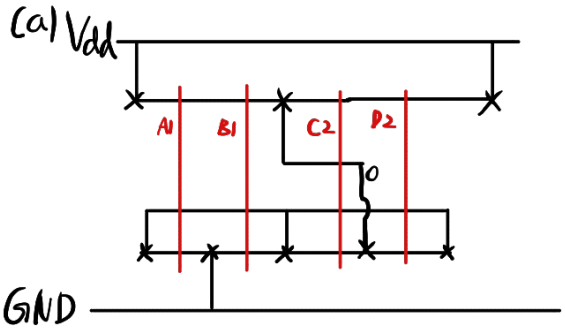


(c) $O = A_1' \cdot B_2$

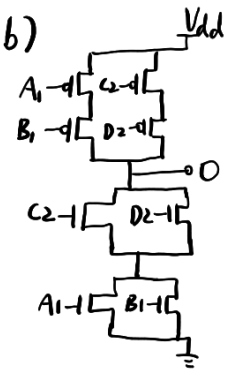
9.



(a)

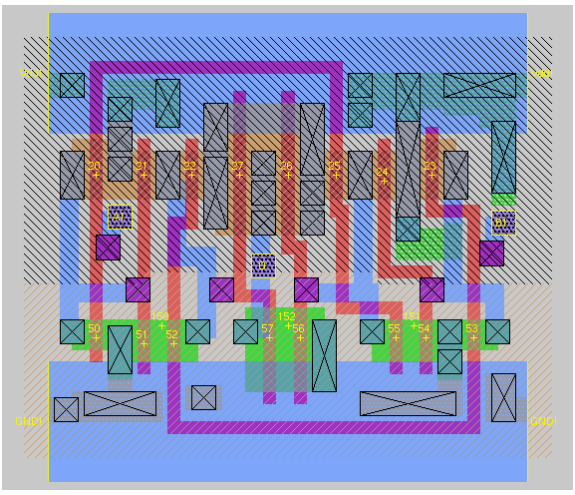


(b)

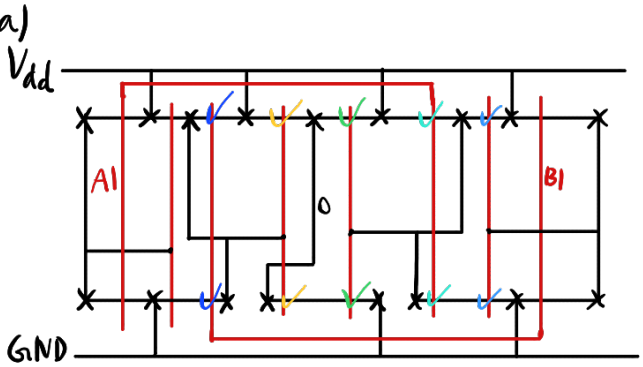


(c) $O = A_1' \cdot B_1' + C_2' \cdot D_2'$

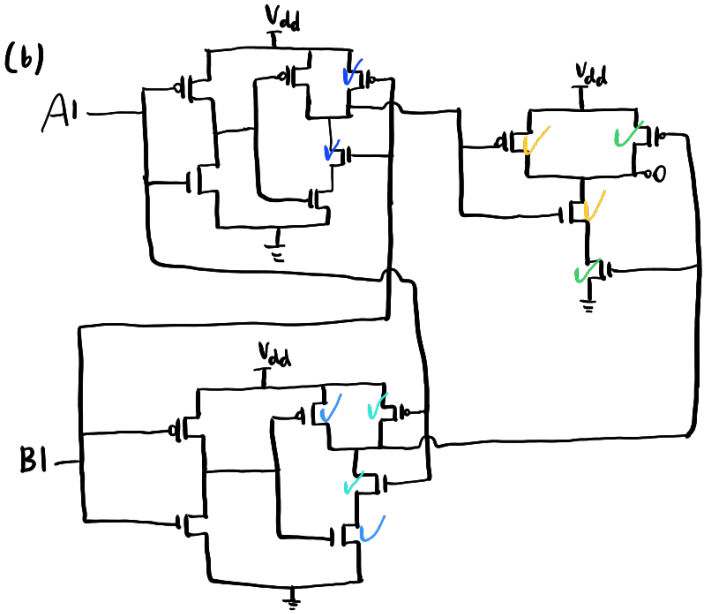
10.



(a)



(b)



(c)

$$O = A_1'B_1 + A_1B_1'$$

$$= A_1 \oplus B_1$$