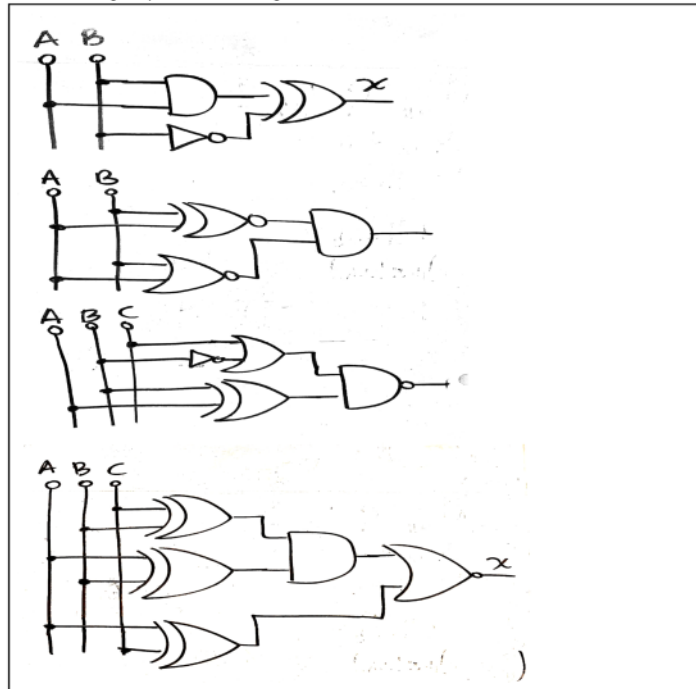


① Write the logic equation for the diagrams below:



② Draw the diagram for the logic equations below:

1. $\text{Out1} = A + C + BD + (\text{not}B \text{ not}D)$
2. $\text{Out2} = \text{not}B + (\text{not}C \text{ not}D) + CD$
3. $\text{Out3} = B + \text{not}C + D$
4. $\text{Out4} = (\text{not}B \text{ not}D) + (C \text{ not}D) + (BC \text{ not}D) + (\text{not}B C) + A$

③ Simplify the K-map Tables below and write the logical equations:

Table 1

ab/c	00	01	11	10
0			1	
1		1	1	

$\bar{A}B + BC$

Table 2

ab/c	00	01	11	10
0		1		1
1	1	1	1	1

$\bar{A}B + A\bar{B} + C$

Table 3

ab/c	00	01	11	10
0	1			1
1	1			1

\bar{B}

Table 4

ab/c	00	01	11	10
0				
1				

Diagram 1:

$$AB \oplus \bar{B} = x$$

Diagram 2:

$$(\bar{A} \oplus B)(\bar{A} + B)$$

No 3:

$$(C + \bar{B})(A \oplus B) = x$$

No 4:

$$((C \oplus B)(A \oplus B)) \oplus (A \oplus C)$$

Q. 2:

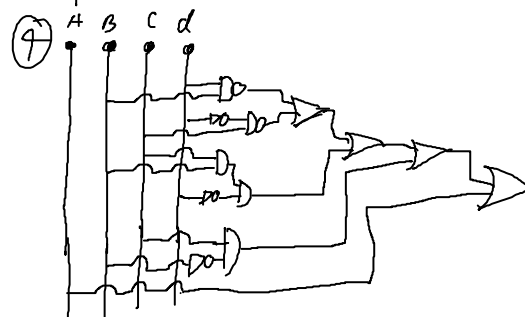
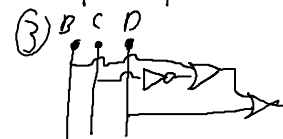
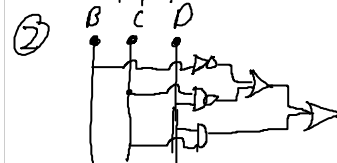


Table 4

ab/ c	00	01	11	10
0	1	1	1	1
1				

$$C + ABC$$

Table 1

ab/ cd	00	01	11	10
00	1			1
01				
11				
10	1			1

$$DB$$

- ④ The apartment below needs a notification system that sends an SMS to the owner when:
- Any of the two windows is open when the main door is locked,
 - The baranda's door is open when the main door is locked,
 - The TV screen is ON when the washing machine and the dish washing machine are ON.

Add 2 more rules and find the equation for the notification system.



2 Other Rules:

Both lights in bedroom are on, and blinds are on
Toilet is flushing but sink is not on

Equation for part a:

$$(Window1 + Window2)(mainIsLocked)$$

Part b:

$$(berandalsOpen * mainIsLocked)$$

Part c:

$$(tvIsOn * washingIsOn * dishwasherIsOn)$$

Part d:

$$(light1 * light2) * blindsAreOpen$$

Part e:

$$isFlushing * bathroomSinkIsOn$$