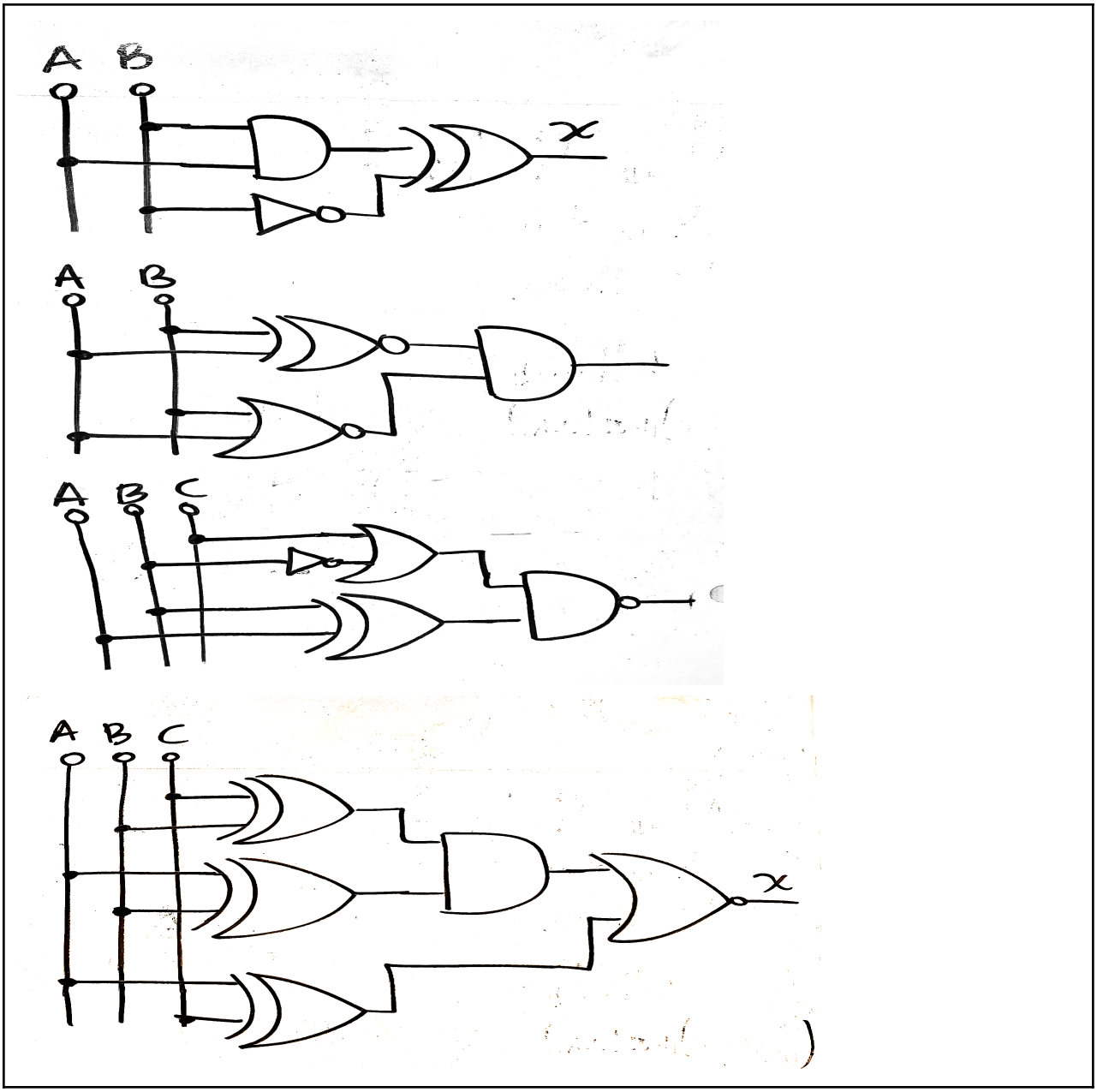
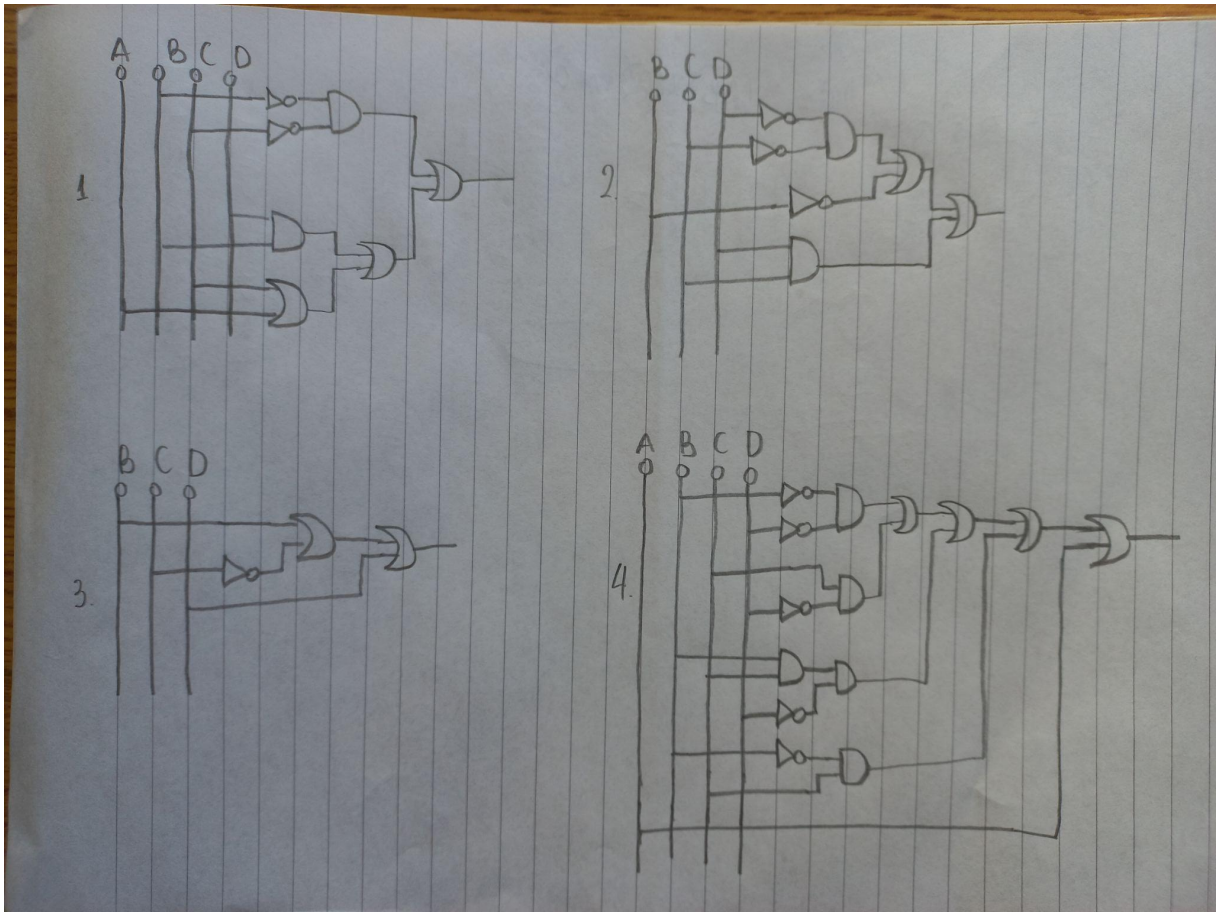
① Write the logic equation for the diagrams below:




1. Out = (AB)XOR(notB)
2. Out = (not(AXORB))AND(ANORB)
3. Out = ((notB)ORC)NAND(AXORB)
4. Out = (AXORC)NOR((AXORB)AND(CXORB))

② Draw the diagram for the logic equations below:

1. Out1 = A + C + BD + (**not**B **not**D)
2. Out2 = **not**B + (**not**C **not**D) + CD
3. Out3 = B + **not**C + D
4. Out4 = (**not**B **not**D) + (C **not**D) + (BC**not**D) + (**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 | |

Out = notAB + CB

**Table 2**

| **ab/ c** | **00** | **01** | **11** | **10** |
|---|---|---|---|---|
| **0** | | 1 | | 1 |
| **1** | | 1 | 1 | 1 |

Out = notAB + AnotB + CB + CA

**Table 3**

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

Out = notAnotB + AnotB + notCnotB + CnotB

**Table 4**

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

Out = notC + AB

**Table 1**

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

Out = notCnotDnotB + CnotDnotB + notAnotBnotD + AnotBnotD

④ The apartment below needs a notification system that sends an SMS to the owner when:

a. Any of the two windows (**W1 or W2)** is open (**True = 1**) when the main door (**F**) is locked (**False = 0**), *((W1 + W2)ANDnotF)*
b. The (**B**) is open (**True = 1**) when the main (**F**) door is locked (**False = 0**), *(BnotF)*
c. The TV **(T)** screen is **ON (True = 1)** when the washing machine (**M**) and the dish washing (**D**) machine are ON. *(T(MD))*

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

d. The baranda's door (**B**) is closed and the left window is open (**W1**) *(notBW1)*
e. When the kitchen (**K**), the washing machine (**M**) and the dish washing (**D**) machine are ON. *(KMD)*

**Out = ((W1 + W2)ANDnotF) + (BnotF) + (T(MD)) + (notBW1) + (KMD)**


W/D
Mech.