Tutorial 02

(01) Imagine you have two inputs A and B, and you want to design a logical circuit that outputs A 1 if and only if

- A is a 0, and B is a 1

or

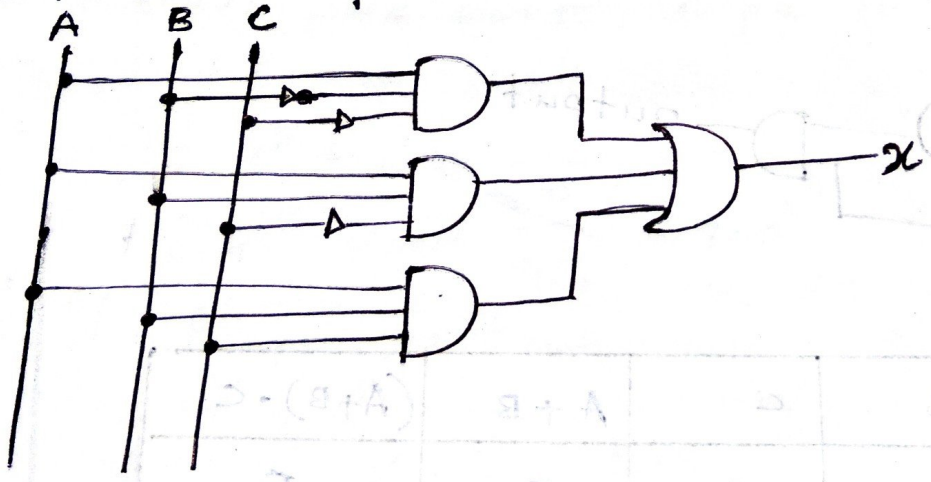
- A is a 1, and B is a 0

which logic gate would you use to create this circuit.

A	B	output
0	0	0
0	1	1
1	0	1
1	1	0

XOR gate

(02) Consider the logic circuit shows the figue in which A, B and C are the inputs and X is the output.



Draw the logical circuit.

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

A	B	C	$\bar{B}$	$\bar{C}$	$A \cdot \bar{B} \cdot \bar{C}$	$A \cdot B \cdot \bar{C}$	$A \cdot B \cdot C$	X
0	0	0	1	1	0	0	0	0
0	0	1	1	0	0	0	0	0
0	1	0	0	1	0	0	0	0
0	1	1	0	0	0	0	0	0
1	0	0	1	1	1	0	0	1
1	0	1	1	0	0	0	0	0
1	1	0	0	1	0	1	0	1
1	1	1	0	0	0	0	1	1

(Q3) Condition

The output x of a logic circuit that devices the display of the alert must have a value of 1 when either one of the conditions is met.

- Carbondixoide pressure too low and temperature > 300°c ~~AND~~ OR
- Water pressure > 10 pa and tem > 300°c

carbon dixoide pressure — A — 1 low, 0 high

temparature B — 1 > 300°c, 0 < 300°c

Water pressure C — 1 > 10 pa, 0 < 10 pa

A	B	C	A · B	C · B	(A · B) + (C · B)
0	0	0	0	0	0
0	0	1	0	0	0
0	1	0	0	0	0
0	1	1	0	1	1
1	0	0	0	0	0
1	0	1	0	0	0
1	1	0	1	0	1
1	1	1	1	1	1