

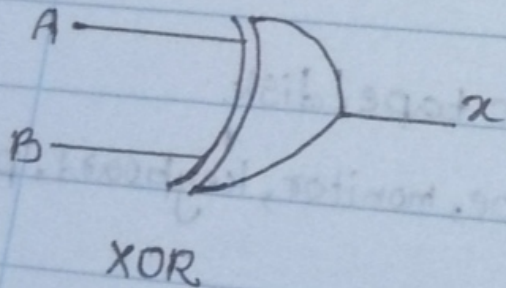
Tutorial 02

01. Imagine you have two inputs A and B and you want to design a logic circuit that outputs 0, 1, if and only if:

- A is a 0 and B is a 1 or
- A is a 1 and B is a 0

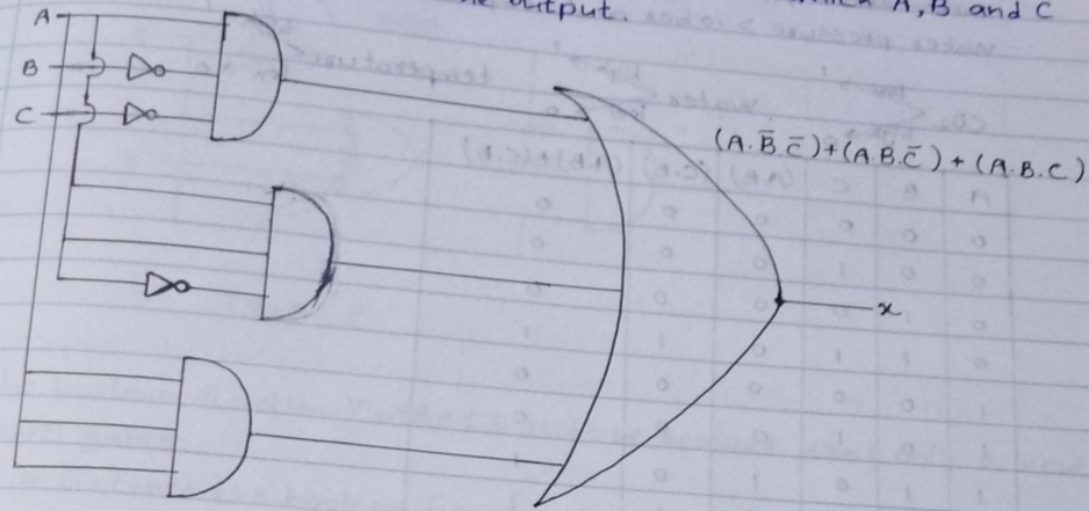
which logic gates would you use to create this circuit.

$$(A'.B) + (A.B')$$



A	B	A'	B'	A'.B	A.B'	(A'.B) + (A.B')
0	0	1	1	0	0	0
0	1	1	0	1	0	1
1	0	0	1	0	1	1
1	1	0	0	0	0	0

a. Consider the logic circuit shown in the figure, in which A, B and C are the inputs and x is the output.



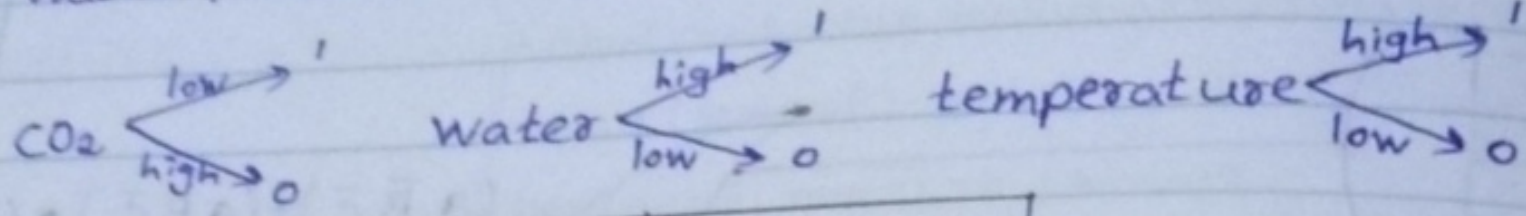
A	B	C	\bar{B}	\bar{C}	$A\bar{B}\bar{C}$	$A\bar{B}C$	$A\bar{B}C$	x
0	0	0	1	1	0	0	0	0
0	0	1	1	0	0	0	0	0
0	1	0	0	1	0	0	0	0
0	1	1	0	0	0	0	0	0
1	0	0	1	1	1	0	0	1
1	0	1	1	0	0	0	0	0
1	1	0	0	1	0	1	0	1
1	1	1	0	0	0	0	1	1

03. Draw the truth table and logic circuit.

Description:- an alert will be displayed when certain conditions occur in a nuclear reactor.

Condition:- The output x of a logic circuit that drives the display of the alert must have a value of 1 when either (or) one of the condition is met.

Carbon dioxide pressure too low and temperature $> 300^{\circ}\text{C}$
 Water pressure $> 10 \text{ bar}$ and temperature $> 300^{\circ}\text{C}$



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