

Q1

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$$F = A \cdot B + (\overline{C \cdot D}) + A \cdot B \cdot (\overline{D})$$

Fill out truth
Table

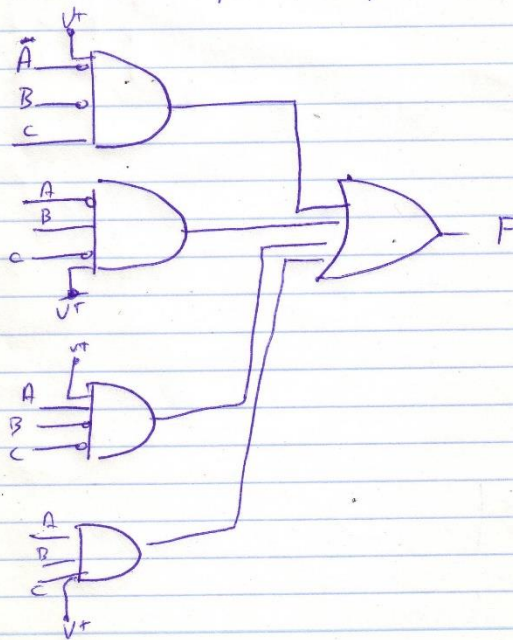
A	B	C	D	
0	0	0	0	1
0	0	0	1	1
0	0	1	0	1
0	0	1	1	0
0	1	0	0	1
0	1	0	1	1
0	1	1	0	1
0	1	1	1	0
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	0
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

Construct circuit
using AND, OR, NOT
Gates

Given

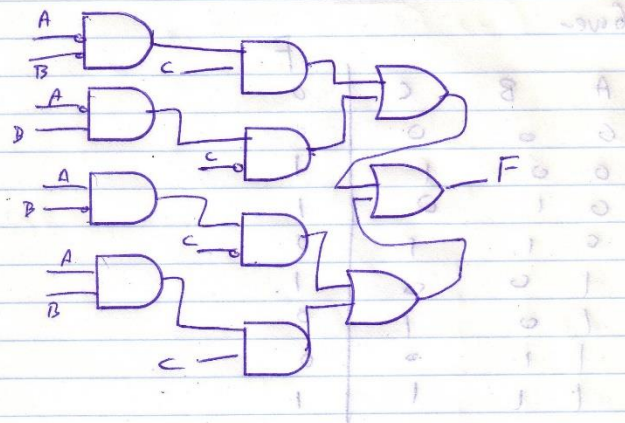
A	B	C	F
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

- Can draw 2nd level logic circuit that will satisfy above truth table
- uses 4 input ANDs and, OR gates
 - uses 2 input ANDs, OR gates



NOTE $\rightarrow \Rightarrow \rightarrow$

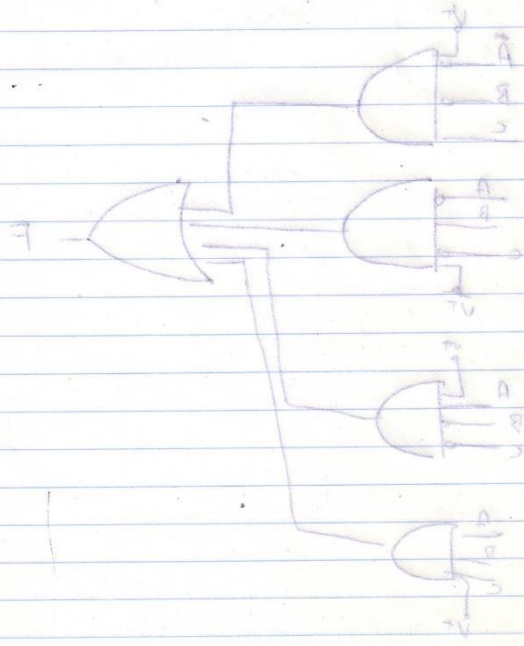
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For the given circuit, find the output F for the input combinations given below.

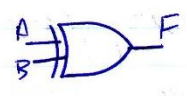
A	B	C	F
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1

Note: \Rightarrow

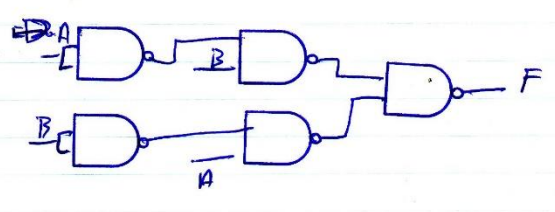
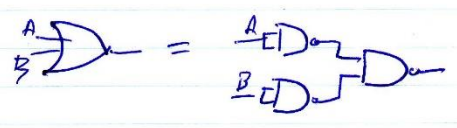
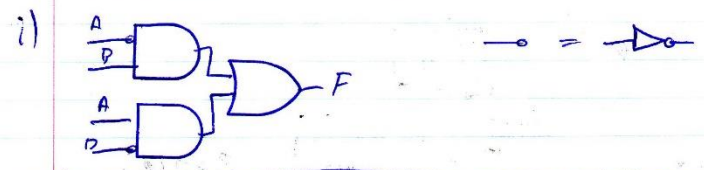


Given: An exclusive OR XOR Gate

A	B	F
0	0	0
0	1	1
1	0	1
1	1	0

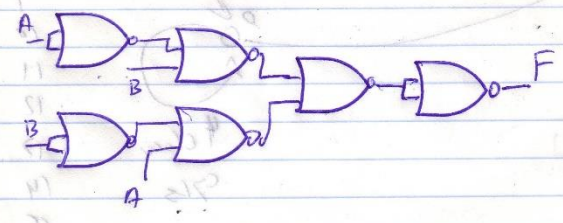
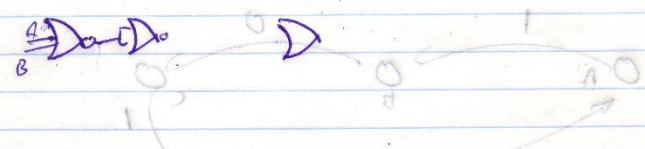
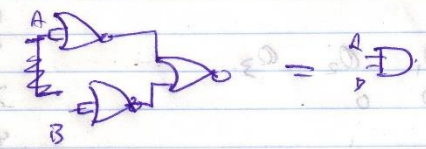


- i) Construct the gate using AND/OR/NOT gates
- ii) Construct the gate using only NAND gates
- iii) Construct the gate using only NOR gates



ii)

Will not work in following manner



Input A and B are connected to the NOT gates. The output of the first NOT gate is B, and the output of the second NOT gate is A. The output A is then connected to the third NOT gate, which has output F. This represents a double negation of A followed by a single negation.