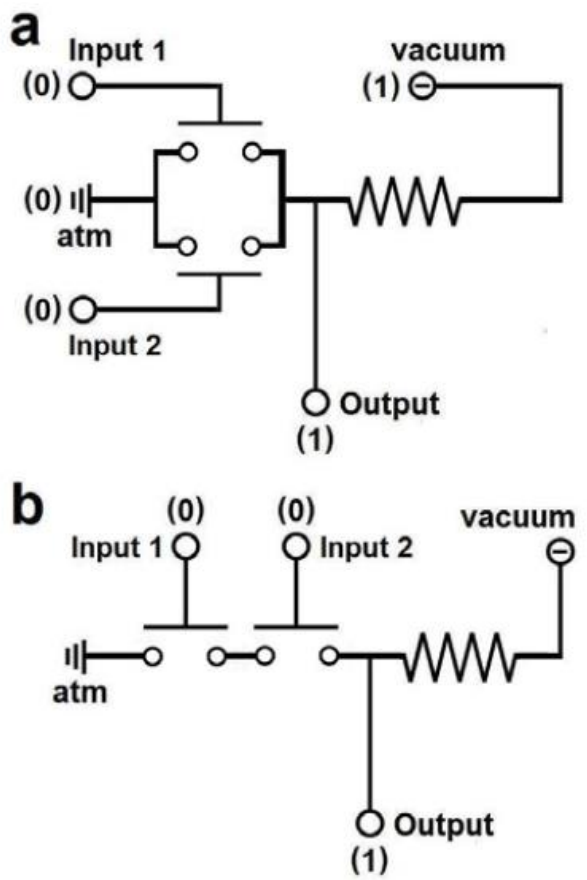
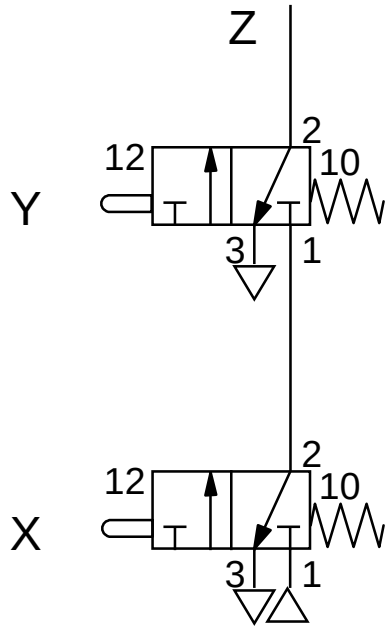
Pneumatic Logic functions

NOR and NAND


a
Input 1
(0)
vacuum
(1)
(0)
atm
(0)
Input 2
Output
(1)
b
(0)
Input 1
(0)
Input 2
vacuum
atm
Output
(1)

Logic AND

- To obtain the output Z both plungers X AND Y must be operated and held
- If X only is operated the air will be blocked at port 1 in valve Y
- If Y only is operated there will be no pressure available at port 1
- If either X or Y is released the output signal Z will be lost



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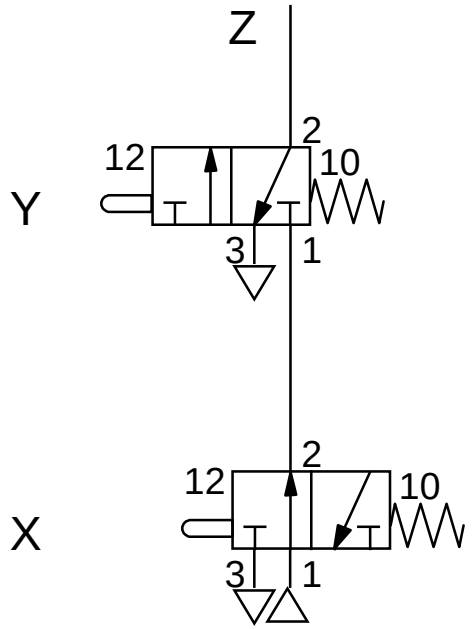

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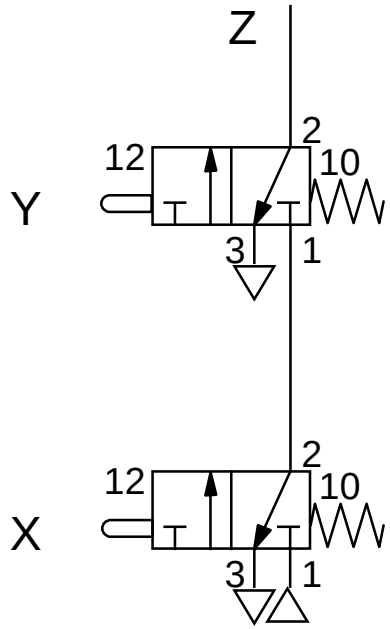

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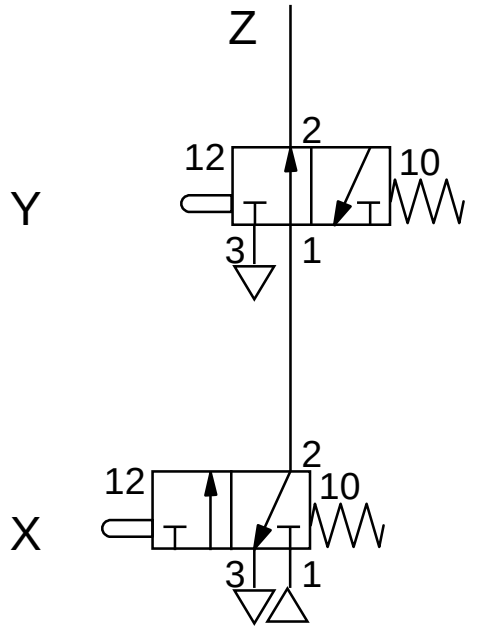

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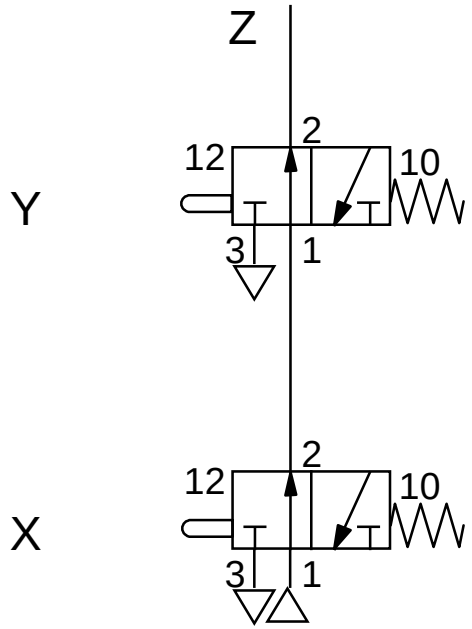

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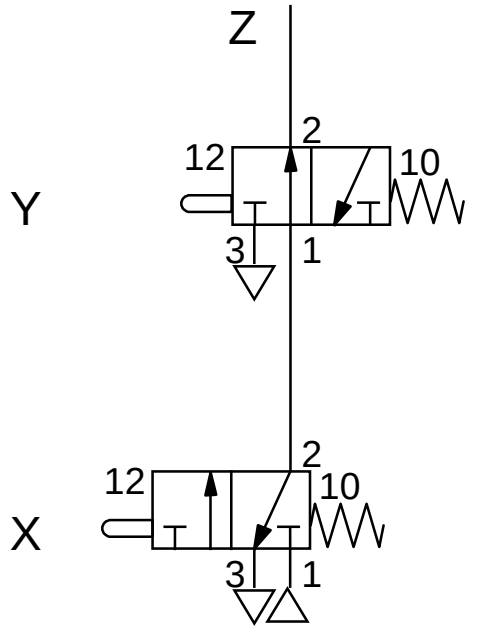

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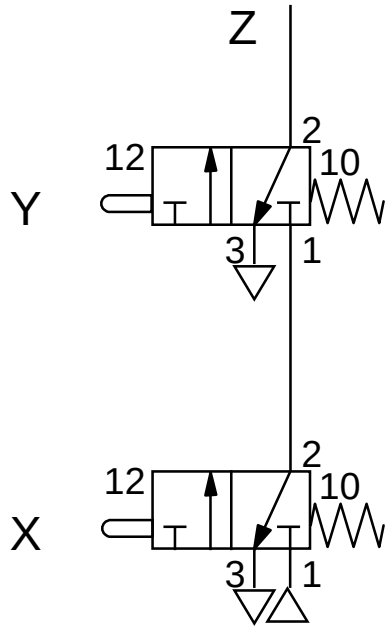
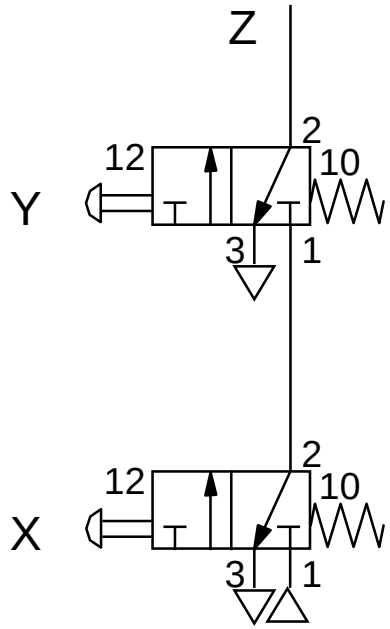


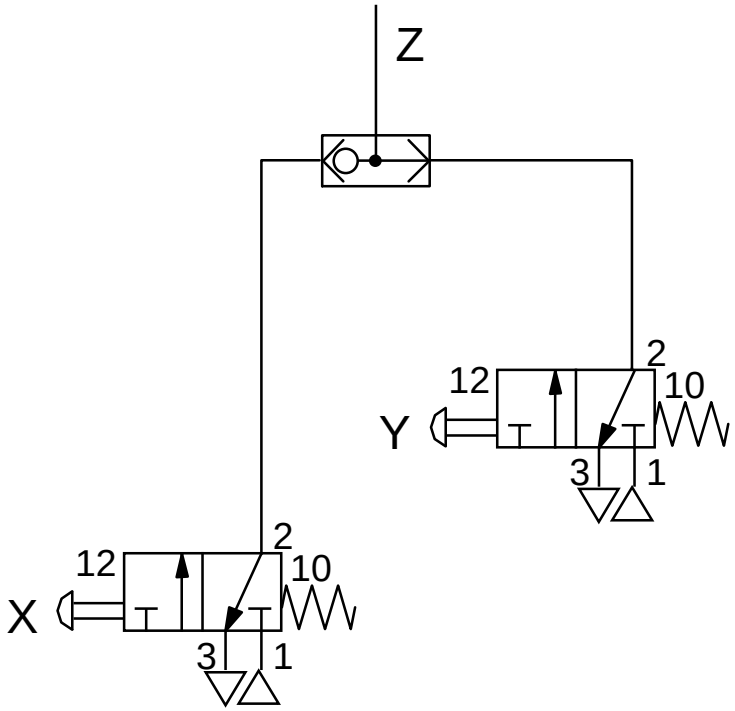
Logic AND

- This method must not be used as a two handed safety control
- It is too easy to abuse. e.g. one of the buttons could be permanently fixed down and the system operated from the other button only
- Use the purpose designed two handed safety control unit



Logic OR

- Use of an ‘OR’ function shuttle valve
- Source X and Y can be remote from each other and remote from the destination of Z
- When X or Y is operated the shuttle valve seal moves across to prevent the signal Z from being lost through the exhaust of the other valve



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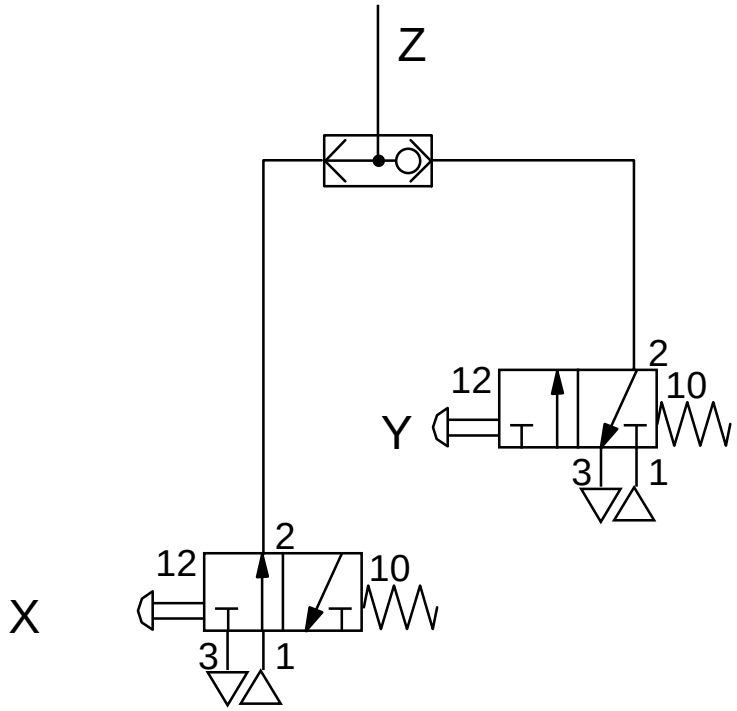

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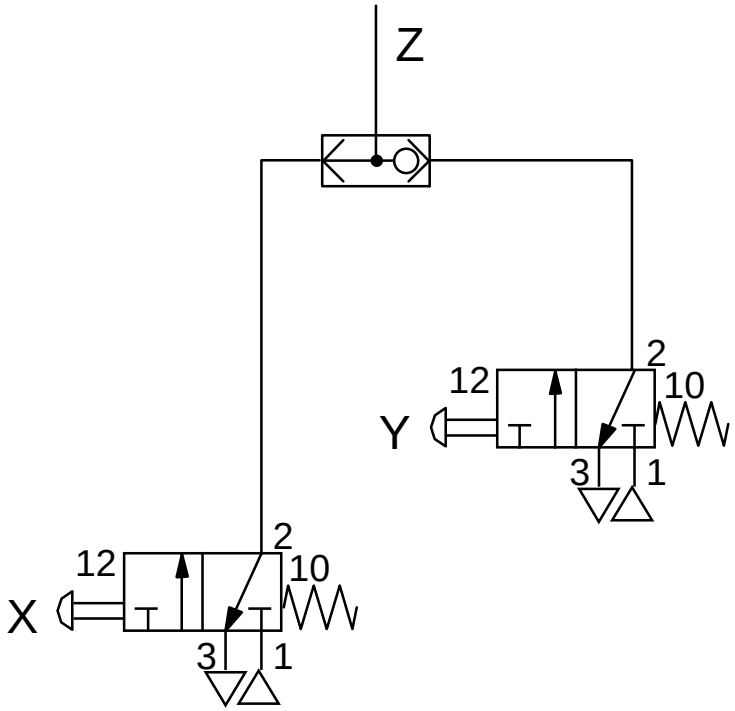

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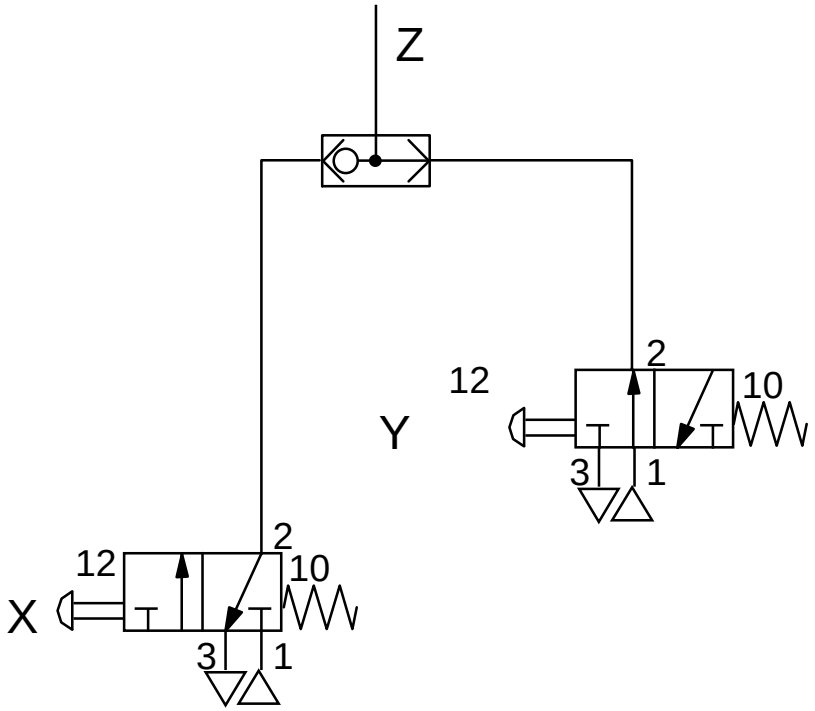

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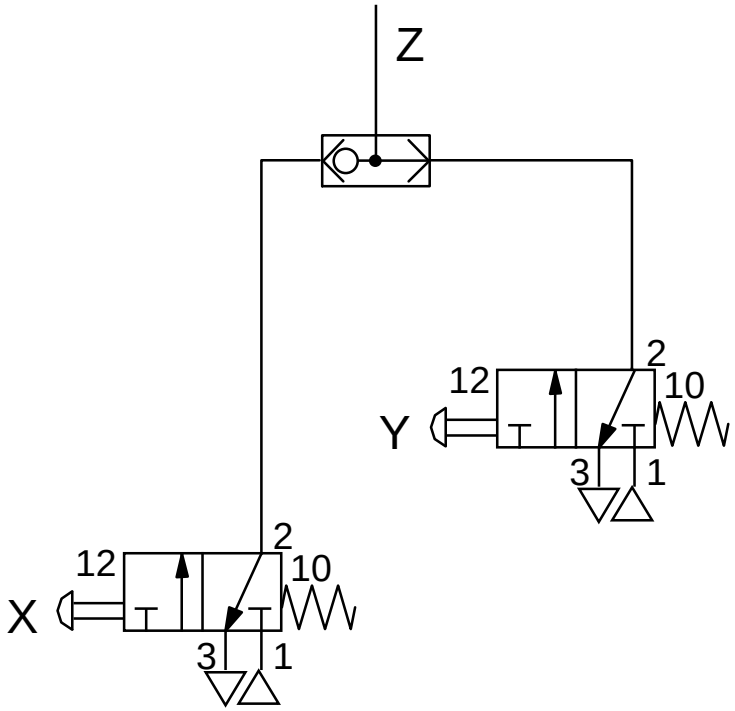
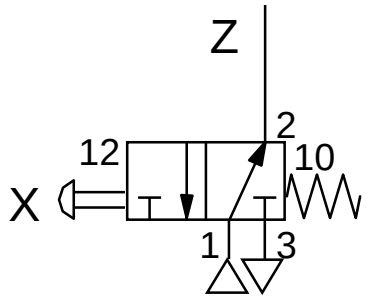


Logic NOT

- A logic NOT applies to the state of the output when the operating signal is present (the output is simply an inversion of the operating signal)
- The valve shown is a normally open type (inlet port numbered 1)
- When the signal X is present there is NOT output Z
- When X is removed output Z is given



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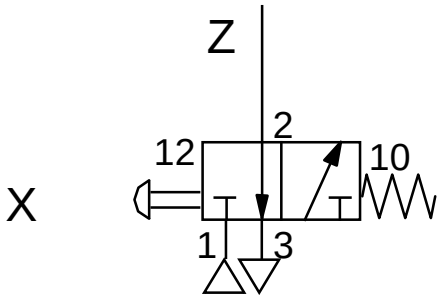

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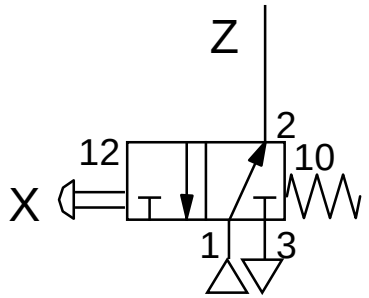
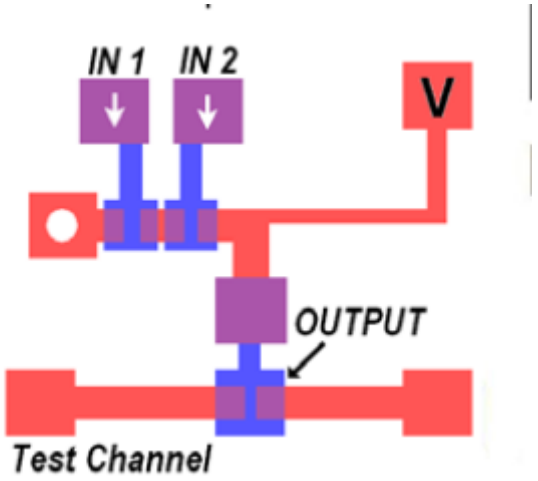
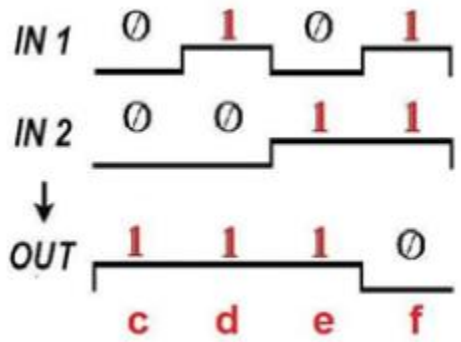


Guess the logic



NAND



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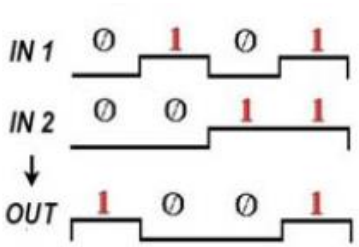
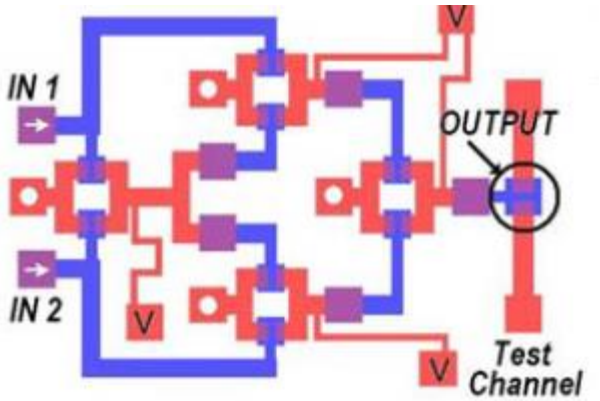
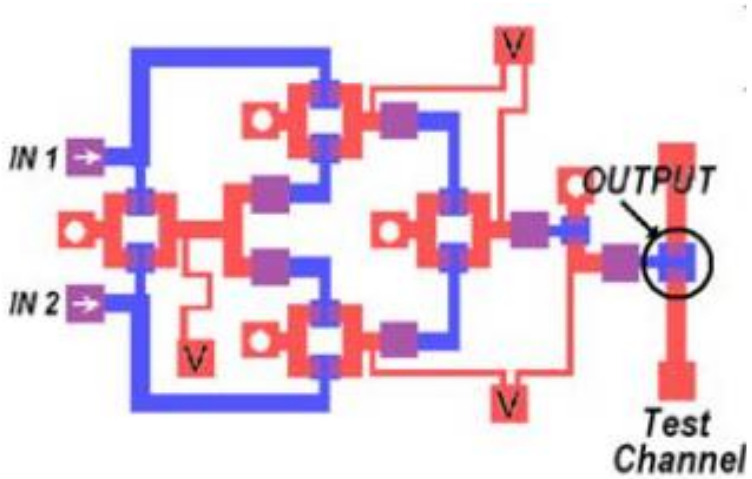
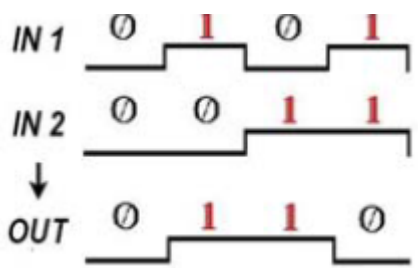





IN 1
IN 2
V
V
V
OUTPUT
Test
Channel


IN 1
IN 2
OUT
0
1
0
1
0
0
1
1
0
1
1
0

XOR