DE

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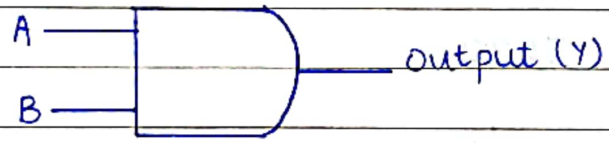
EXPERIMENT - 1

- AIM : To verify and interpret the logic for AND, OR, NOT, NAND, NOR, EX-OR, Ex-NOR gates using the simulators available and if possible verify it on a breadboard.

→ AND GATE :

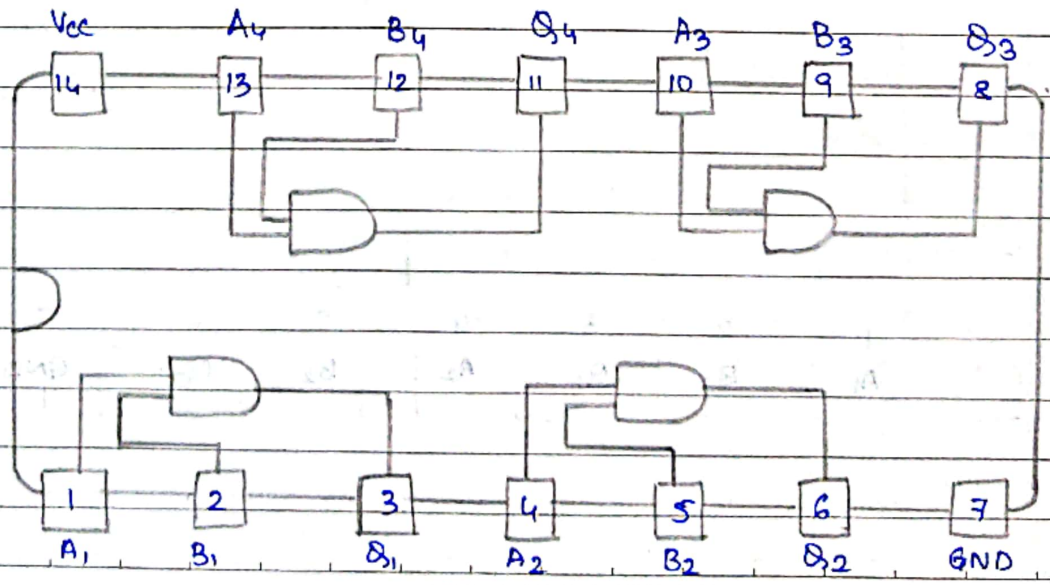
* THEORY : The AND gate is an electronic circuit that gives a high output (1) only if all its inputs are high. A dot (·) operator is used to show the AND operation i.e A·B or can be written as AB

* EXPRESSION : $Y = A \cdot B$



* IC NUMBER : 7408

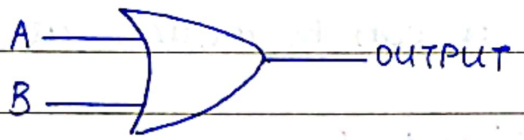
* IC DIAGRAM FOR AND GATE :



→ OR GATE :-

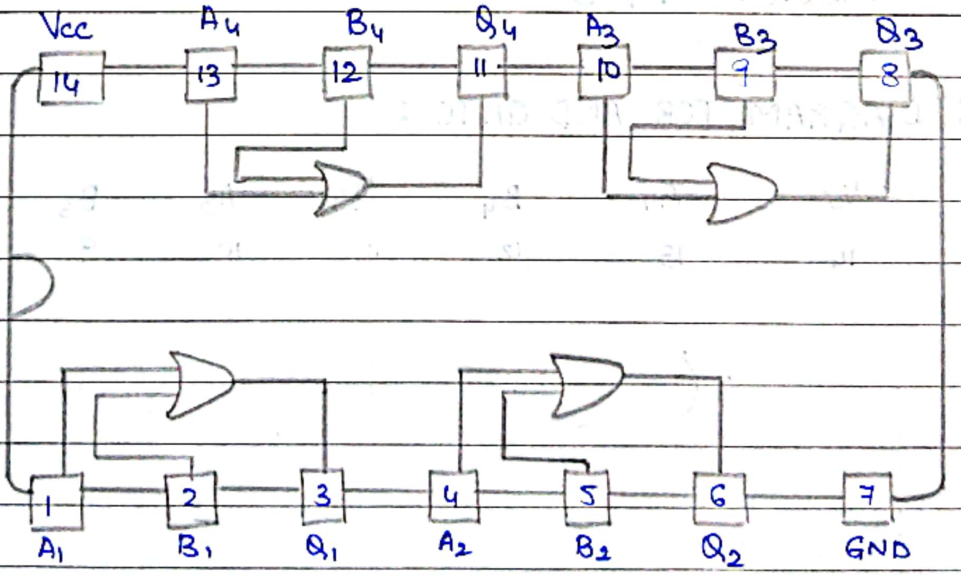
* THEORY : The OR gate is an electronic circuit that gives a high output (1) if more than one or one of the inputs is high. A plus (+) is used to show the OR operator

* EXPRESSION : $Y = A + B$



* IC NUMBER : 7432

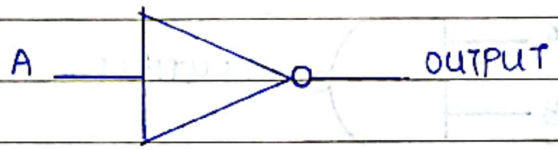
* IC DIAGRAM FOR OR GATE



→ NOT GATE :-

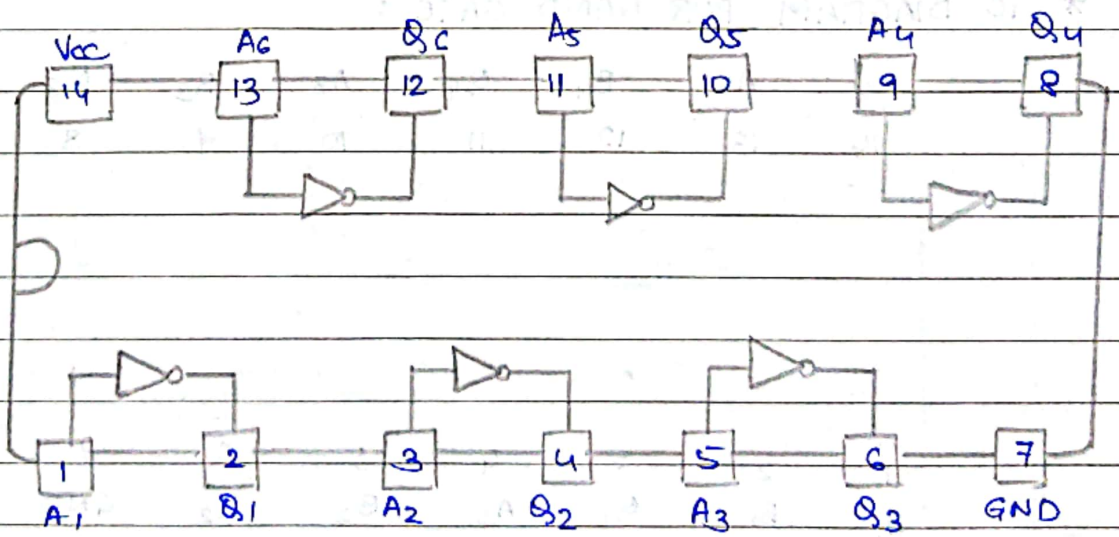
* THEORY : The NOT gate is an electronic gate (circuit) that produces an inverted version of the input as its output. It is also known as an inverter. If the input variable is A, the inverted output is known as NOT A. It is represented as A' or $\bar{A}$.

* EXPRESSION : $Y = \bar{A}$



* IC NUMBER : 7404

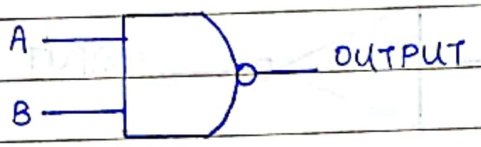
* IC DIAGRAM FOR NOT GATE :



→ NAND GATE

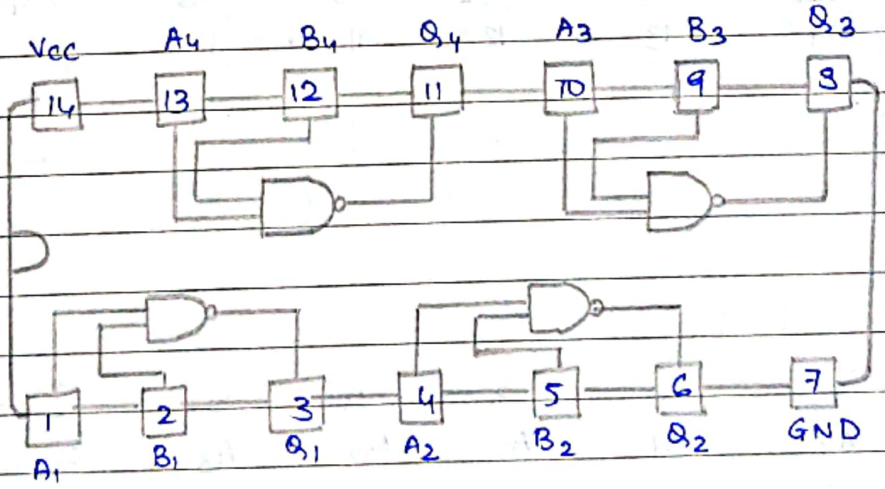
* THEORY : This is a NOT-AND gate which is equal to AND gate followed by a NOT gate. The outputs of all NAND gates are high if any of the inputs are low. The symbol is an AND gate with a small circle on the output. The small circle represents inversion.

* EXPRESSION : $Y = \overline{A \cdot B}$



* IC NUMBER : 7400

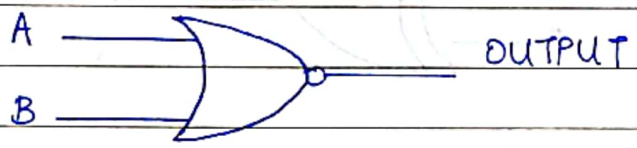
* IC DIAGRAM FOR NAND GATE :



→ NOR GATE

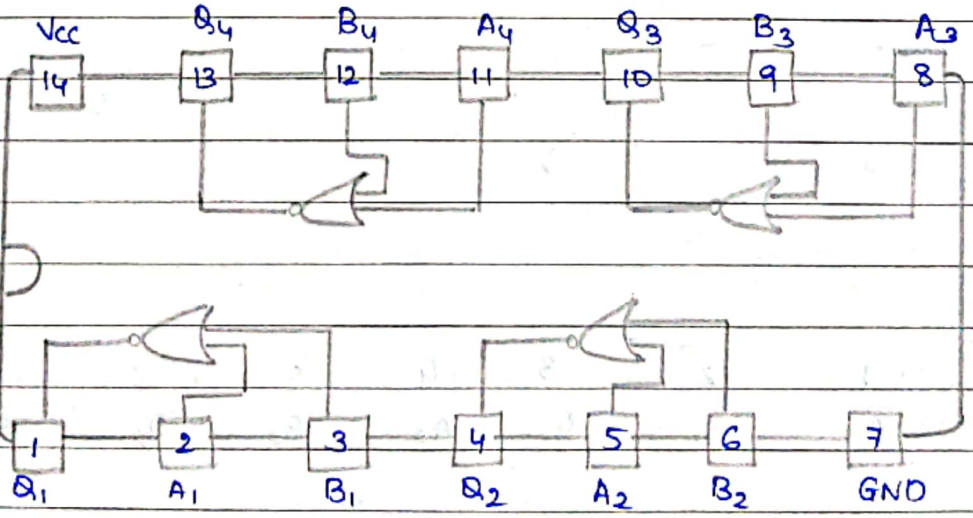
* THEORY : This is a NOT-OR gate which is equal to an OR gate followed by a NOT gate. The outputs of all NOR gates are low if any of the inputs is high. The symbol is an OR gate with a small circle on the output. The small circle represents inversion.

* EXPRESSION: $Y = \overline{A + B}$



* IC NUMBER : 7402

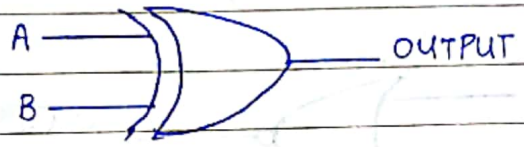
* IC DIAGRAM FOR NOR GATE :



→ EX-OR GATE :-

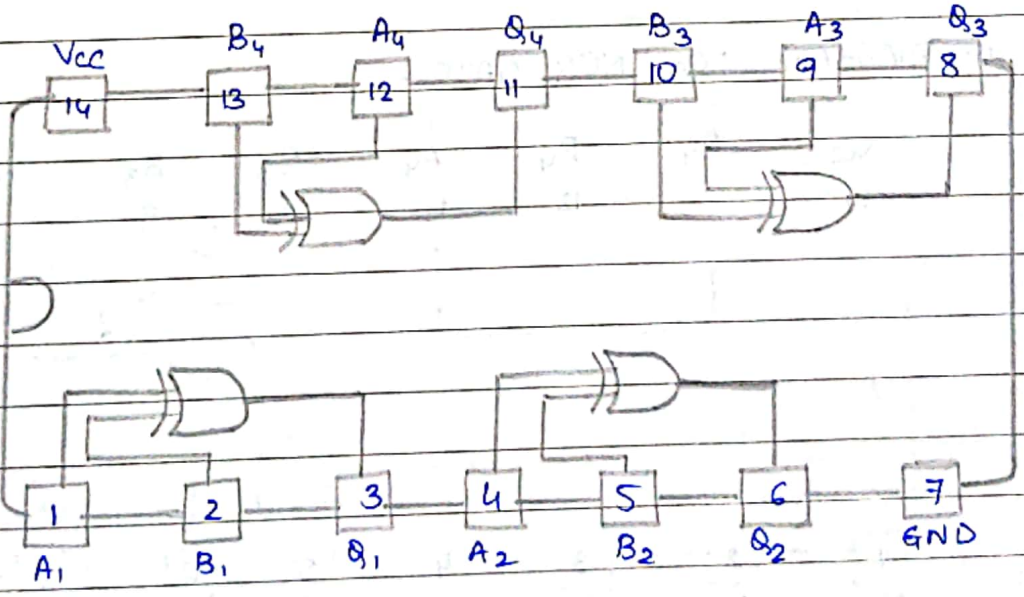
* THEORY: The 'enclusive-OR' gate is a circuit which will give a high output if either, but now both of its inputs are high. An encircled plus sign ⊕ is used to show the EX-OR operation.

* EXPRESSION: $Y = A \oplus B$



* IC NUMBER : 7486

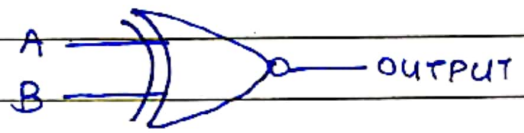
* IC DIAGRAM FOR EX-OR GATE:



→ EX-NOR GATE : -

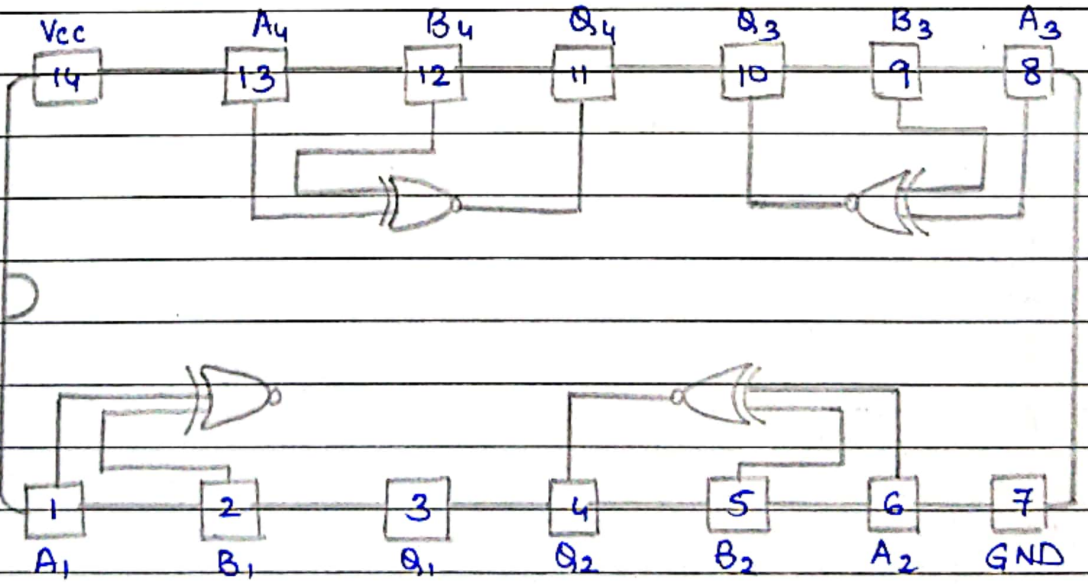
* THEORY : The 'enclusive NOR' gate circuit acts opposite to the Ex-OR gate. It gives a low output if either, but not both of its two inputs are high. The symbol is an Ex-OR gate with a small circle on the output. The small circle represents inversion.

* EXPRESSION : $Y = \overline{A \oplus B}$

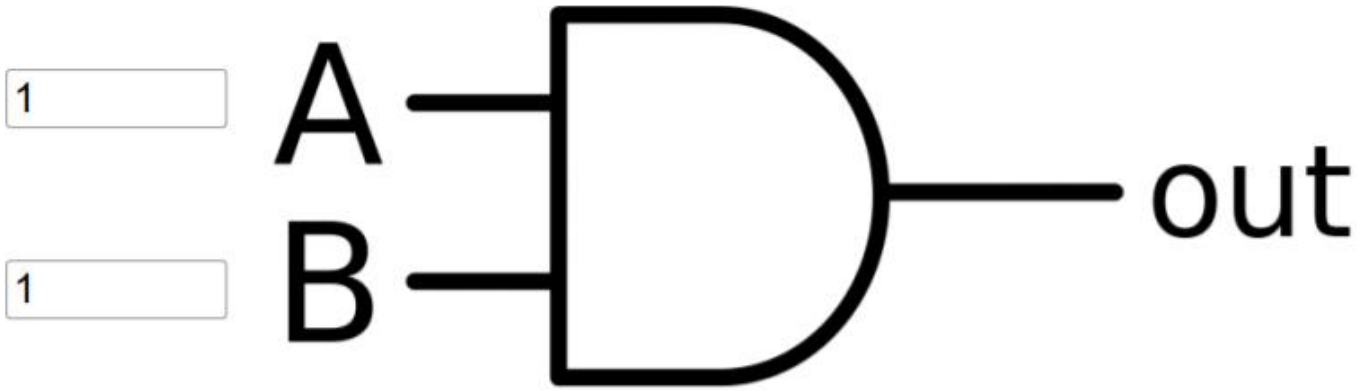


* IC NUMBER : 74266

* IC DIAGRAM FOR EX-NOR GATE :



Verification of truth table for AND gate



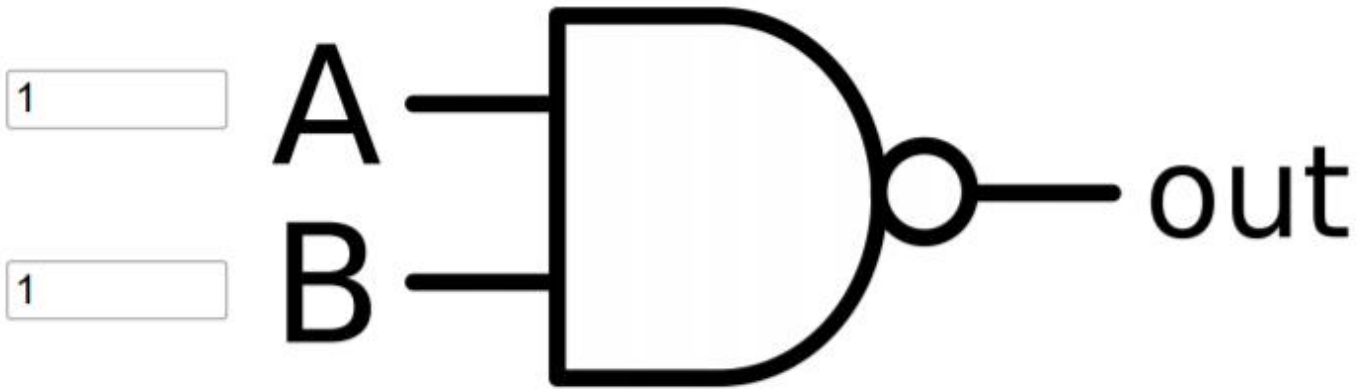
TRUTH TABLE

Print

Serial No.	A	B	Output	Remarks
1	0	0	0	Correct
2	0	1	0	Correct
3	1	0	0	Correct
4	1	1	1	Correct

Reset

Verification of truth table for NAND gate



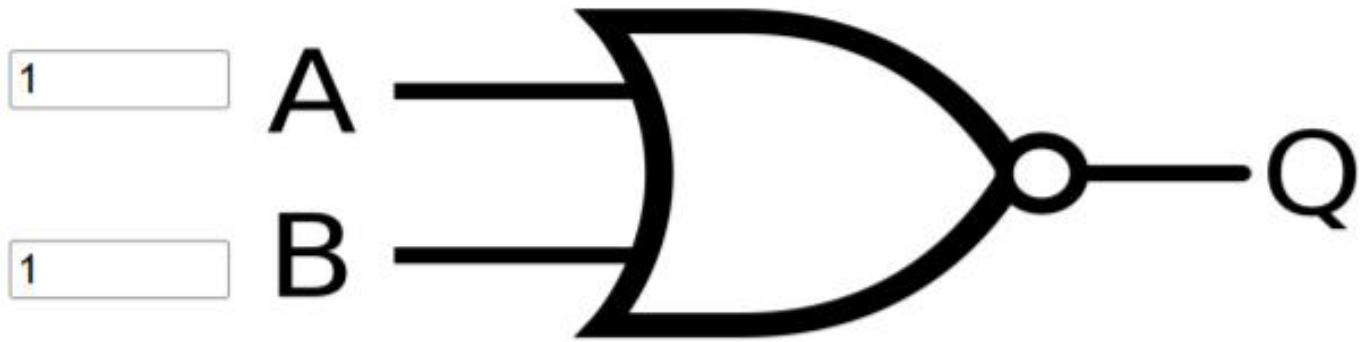
TRUTH TABLE

Print

Serial No.	A	B	Output	Remarks
1	0	0	1	Correct
2	0	1	1	Correct
3	1	0	1	Correct
4	1	1	0	Correct

Reset

Verification of truth table for NOR gate



TRUTH TABLE

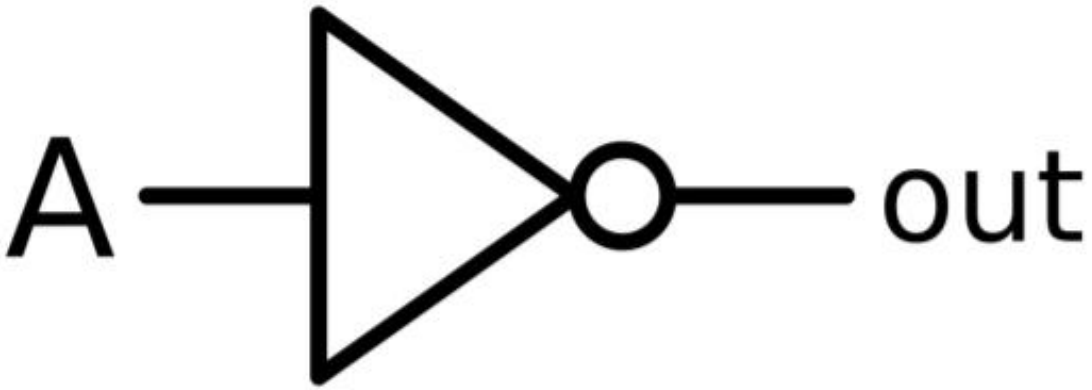
Print

Serial No.	A	B	Output	Remarks
1	0	0	1	Correct
2	0	1	0	Correct
3	1	0	0	Correct
4	1	1	0	Correct

Reset

Verification of truth table for NOT gate

1



0

Check

TRUTH TABLE

Print

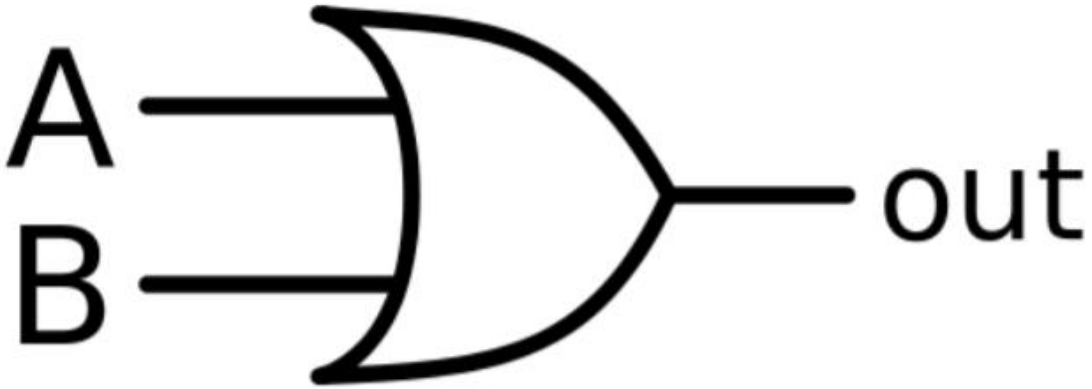
Serial No.	A	Output	Remarks
1	0	1	Correct
2	1	0	Correct

Reset

Verification of truth table for OR gate

1

1



1

Check

TRUTH TABLE

Print

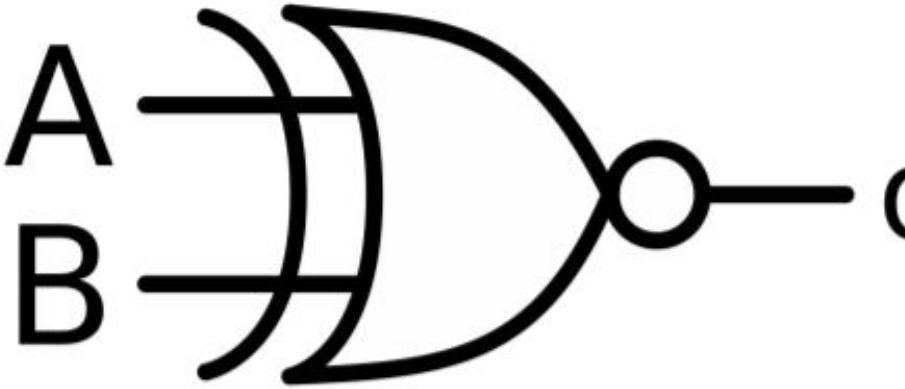
Serial No.	A	B	Output	Remarks
1	0	0	0	Correct
2	0	1	1	Correct
3	1	0	1	Correct
4	1	1	1	Correct

Reset

Verification of truth table for XNOR gate

1

1



1

Check

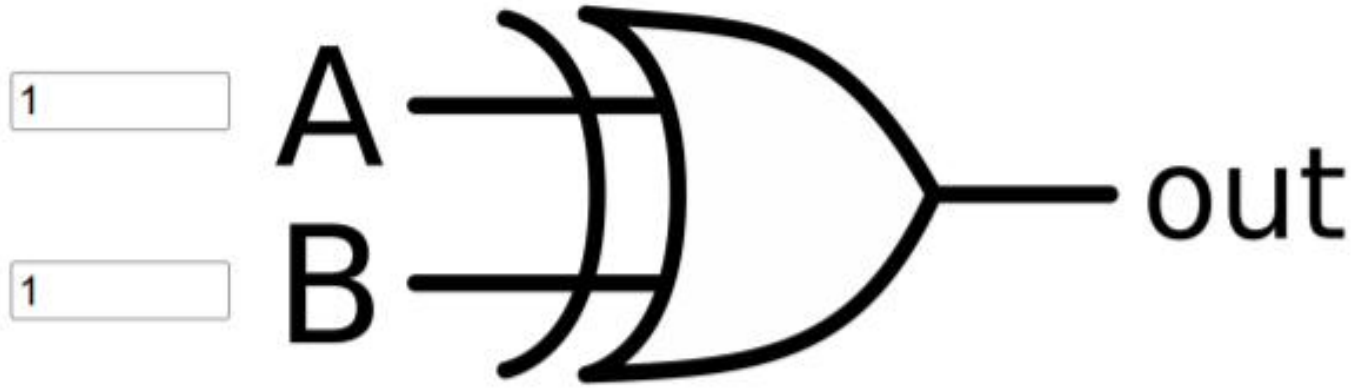
TRUTH TABLE

Print

Serial No.	A	B	Output	Remarks
1	0	0	1	Correct
2	0	1	0	Correct
3	1	0	0	Correct
4	1	1	1	Correct

Reset

Verification of truth table for XOR gate



TRUTH TABLE

Print

Serial No.	A	B	Output	Remarks
1	0	0	0	Correct
2	0	1	1	Correct
3	1	0	1	Correct
4	1	1	0	Correct

Reset