BEE Experiments Record.

10. VERIFICATION & INTERPRETATION OF LOGIC GATES.

☆ PRE - LAB QUESTIONS ⟹

① Name the different Logic Gates.

→ A Logic Gate is an idealized model of computation or physical electronic device implementing a Boolean function, a logical operation performed on one or more binary inputs that produces a single binary output.

The different Logic Gates are as follows:

1) AND
2) OR
3) NOT
4) NAND
5) NOR
6) X-OR (Exclusive OR).
7) X-NOR (Exclusive NOR).

② List out the IC names for different Logic Gates.

→ The IC names for different Logic Gates are as follows:

1) AND Gate ⟶ IC = 7408
2) OR Gate ⟶ IC = 7432
3) NOT Gate ⟶ IC = 7404
4) NAND Gate ⟶ IC = 7400
5) NOR Gate ⟶ IC = 7402
6) X-OR Gate ⟶ IC = 7486
7) X-NOR Gate ⟶ IC = 74266

③ What is the Boolean expression for a NOR Gate?

→ The Boolean expression for NOR Gate is as follows:

$y = \overline{A+B}$

④ How does a NOR Gate work?

→ The NOR Gate is a digital logic gate that implements logical NOR - it behaves according to the truth table. A HIGH output (1) results if both the inputs to the gate are LOW (0); if one or both input is HIGH (1), a LOW output (0) results.
NOR is the result of the negation of OR operator.
It follows: $y = \overline{A+B}$ as Boolean equation.
Its Truth-Table is as follows:

INPUT		OUTPUT
A	B	$\overline{A+B}$
0	0	1
0	1	0
1	0	0
1	1	0

⑤ Eæpression for EX-OR and EX-NOR?

→ 1) The Boolean eæpression for EX-OR: $y = A \oplus B$

so, $y = A \oplus B = \bar{A} \cdot B + A \cdot \bar{B}$

2) The Boolean eæpression for EX-NOR: $y = \overline{A \oplus B}$

so, $y = \overline{A \oplus B} = \overline{\bar{A} \cdot B + A \cdot \bar{B}}$

★ AIM ⟹

To verify the Boolean eæpression using Logic Gates.

★ APPARATUS REQUIRED ⟹

Logic trainer kit, Logic Gates / ICs, wires.

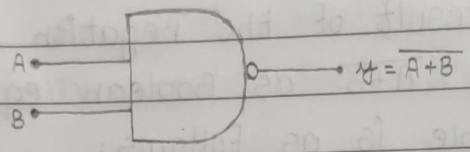
☆ POST - LAB QUESTIONS ⟹

① Name the Universal Gates?

→ The Universal Gates are NAND and NOR.

② What is the symbol of NAND Gate?

→ The symbol of NAND Gate is as follows:



③ How many NAND Gates are required to make an OR Gate?

→ Three NAND Gates are required to make an OR Gate

④ How many NOR Gates are required to implement a NAND Gate?

→ Four NOR Gates are required to implement a NAND Gate.