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Course - MCA

Subject \rightarrow Computer Organisation and Architecture

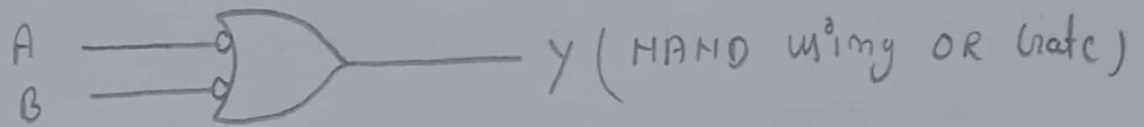
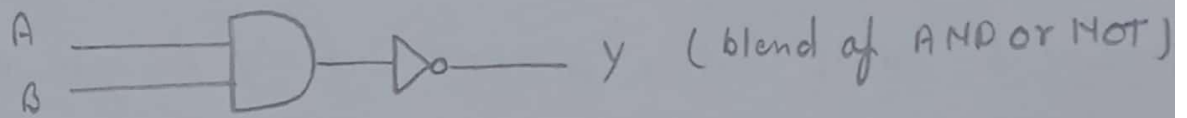
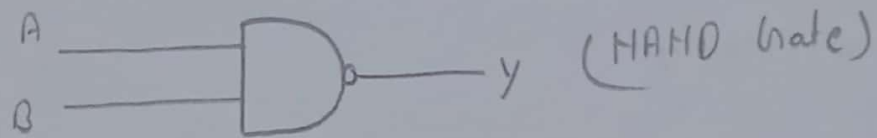
Answer \rightarrow NAND Gate \rightarrow A NAND Gate is the gate that perform reverse operation of an AND logic gate. It is blend of AND and NOT gates and is commonly used logic gate.

The NAND gate has an output that is normally at logic high and only goes to logic low when all of its inputs are at logic high. The logic NAND Gate gives the reverse or complementry design of AND gate.

NAND Gate Symbol \rightarrow The NAND gate is AND gate succeeded by NOT gate. A NAND gate constitutes one or more input with a single output. The NAND gate represented by a symbol whose shape matches the AND gate with a circle followed, often identified as an inversion circle.

Manjeet Singh

Circuit Diagram →



Qutub

The Boolean expression for a logic NAND gate is represented by a single dot or full stop, (.) followed by line or Overline (—) over the expression to imply the NOT or logical negation of the NAND gate. Below is the NAND gate boolean expression for two inputs.

$$[Y = \overline{A \cdot B} = \overline{A} + \overline{B}]$$

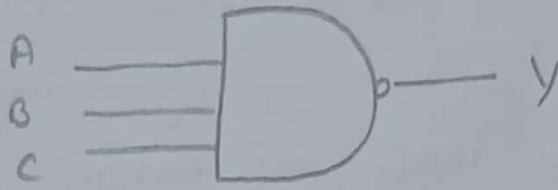
Truth table →

| Input | | Output |
|-------|---|--------|
| A | B | Y |
| 0 | 0 | 1 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

⇒ 3-input NAND gate → the three input NAND gate has three inputs. The symbolic representation of the three input NAND gate is as follow.

Aditya

Circuit diagram →



The boolean expression of the logic NAND gate is represented as the binary operation dot (\cdot)

A, B and C are the input and Y is output.

$$Y = \overline{A \cdot B \cdot C}$$

Truth table ↓

| A | B | C | Y |
|---|---|---|---|
| 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 1 |
| 0 | 1 | 0 | 1 |
| 0 | 1 | 1 | 1 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 0 |

Signature