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Ques 1. Discuss the working of NAND gate with the help of circuit diagram and truth table.

Ans: NAND gate is a digital logic gate, designed for arithmetic and logical operations, every electronic student must have studied this gate is his/her career. This gate is mainly used in applications where there is a need for mathematical calculations. So calculators, computers and many digital applications use this gate.

In digital electronics, a NAND gate (NOT-AND) is a logic gate which produces an output which is false only if all its inputs are true; thus its output is complement to that of an AND gate. A LOW (0) output results only if all the inputs to the gate are HIGH (1); if any input is LOW (0), a HIGH (1) output results.

the NAND gate is the inverse of an AND gate, and its circuit is produced by connecting an AND gate to a NOT gate. Just like an AND gate, a NAND gate may have any number of input probes but only one output probe.

Truth

table:

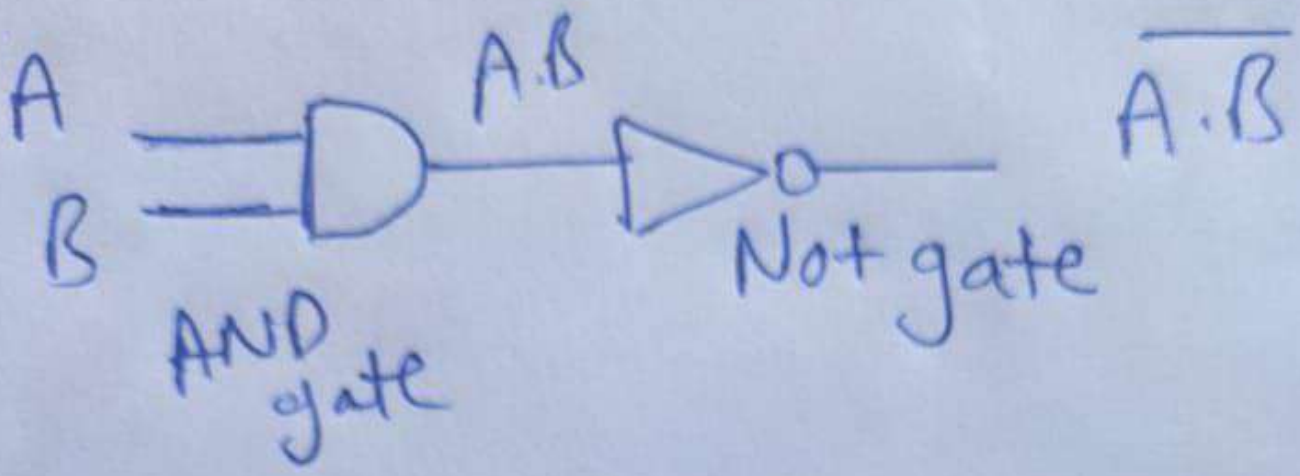
we know that the output of the AND gate is only high or 1 when all the inputs are high or 1. In all other cases, the output of the AND gate is low or 0.

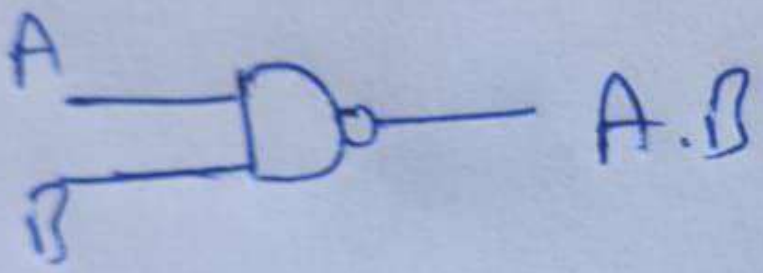
A	B	y
0	0	1
0	1	1
1	0	1
1	1	0

Logic diagram:

As mentioned earlier, a NAND gate is a NOT gate followed by an AND gate, so if we can cancel the effect of NOT gate in a NAND gate, it will become an AND gate. Hence, a NOT gate followed by a NAND gate realizes an AND gate.

In this case, we use the NOT gates realized from NAND gates, and we are showing the logic circuit below:


A
B
A.B
$\overline{A.B}$
AND gate
Not gate


A
B
A.B