Digital electronics

Lecture - 5

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Logic gate

A logic gate is a building block of a digital circuit.

Most logic gates have two inputs and one output and are based on Boolean algebra.

At any given moment, every terminal is in one of the two binary conditions high or (low. se represents 1 and 0.

Depending on the type of logic gate being used and the combination of inputs, the binary output will differ.

A logic gate can be thought of like a light switch, wherein one position the output is off—0, and in another, it is on—1.

Logic gates are commonly used in integrated circuits (IC).

**Basic logic gates**

There are seven basic logic gates: OR, AND, NOT, NAND, NOR, XOR and XNOR.

OR gate : if any one of input is in on condition, the output will be on then this condition is known as ORing and gate is known as OR gate .

The *OR gate* gets its name from the fact that it behaves after the fashion of the

 logical inclusive "or." The output is "true" if either or both of the inputs are "true." If both inputs are "false," then the output is "false." In other words, for the output to be 1, at least input one OR two must be 1.
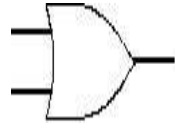
OR gate

**Truth Table of OR gate**

A+ 0 = A

A + 1 = 1

Input 1	Input 2	Output
1	1	1
0	1	1
1	0	1
0	0	0

AND gate : if any one of input is in off condition, the output will be off then this condition is known as ANDing and gate is known as AND gate .

AND *gate* is so named because, if 0 is called "false" and 1 is called "true," the gate acts in the same way as the logical "AND" operator. The following illustration and table show the circuit symbol and logic combinations for an AND gate. (In the symbol, the input terminals are at left and the output terminal is at right.) The output is "true" when both inputs are "true." Otherwise, the output is "false." In other words, the output is 1 only when both inputs one AND two are 1.
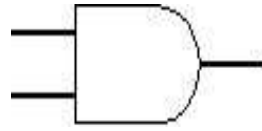
AND gate

Truth Table

Input 1	Input 2	Output
0	0	0
0	1	0
1	0	0
1	1	1

A.0 = 0

A.1 = A