



G H RAISONI COLLEGE OF ENGINEERING AND MANAGEMENT WAGOLI PUNE

(AT AUTONOMOUS INSTITUTE AFFILIATE SAVITRIBAI BHULE PUNE UNIVERSITY PUNE)



BOOLEAN ALGEBRA

BOOLEAN ALGEBRA IS A DIVISION OF MATHEMATICS THAT DEALS WITH OPERATIONS ON LOGICAL VALUES AND INCORPORATES BINARY VARIABLES. BOOLEAN ALGEBRA TRACES ITS ORIGINS TO AN 1854 BOOK BY MATHEMATICIAN GEORGE BOOLE. BOOLEAN

MOST COMMONLY BOOLEAN VARIABLES ARE PRESENTED WITH THE POSSIBLE VALUES OF 1 ("TRUE") OR 0 ("FALSE").

VALUES

DESCRIPTION OF THE LAWS OF BOOLEAN ALGEBRA

ANNULMENT LAW - A TERM AND'ED WITH A "0" EQUALS 0 OR OR'ED WITH A "1" WILL EQUAL 1

$A \cdot 0 = 0$ A VARIABLE AND'ED WITH 0 IS ALWAYS EQUAL TO 0

$A + 1 = 1$ A VARIABLE OR'ED WITH 1 IS ALWAYS EQUAL TO 1

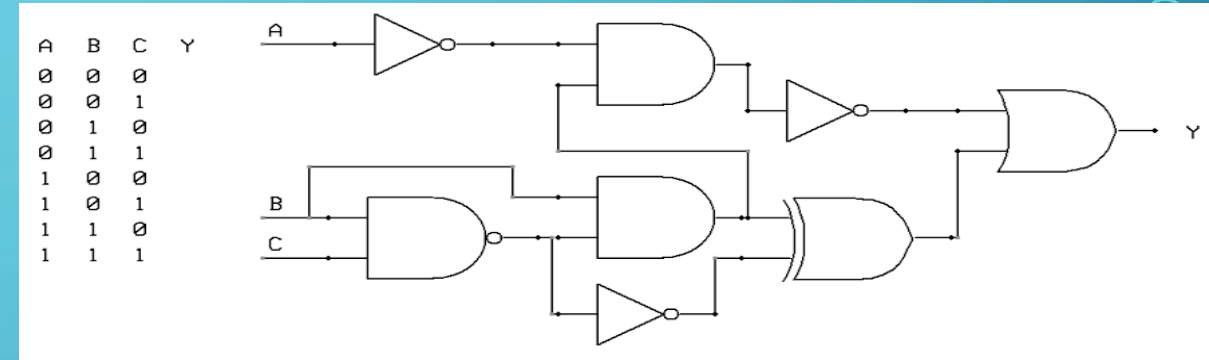
IDENTITY LAW - A TERM OR'ED WITH A "0" OR AND'ED WITH A "1" WILL ALWAYS EQUAL THAT TERM

$A + 0 = A$ A VARIABLE OR'ED WITH 0 IS ALWAYS EQUAL TO THE VARIABLE

$A \cdot 1 = A$ A VARIABLE AND'ED WITH 1 IS ALWAYS EQUAL TO THE VARIABLE

IDEMPOTENT LAW - AN INPUT THAT IS AND'ED OR OR'ED WITH ITSELF IS EQUAL TO THAT INPUT

$A + A = A$ A VARIABLE OR'ED WITH ITSELF IS ALWAYS EQUAL TO THE VARIABLE



$A \cdot A = A$ A variable AND' ed with itself is always equal to the variable

INVERSION law

This law uses the NOT operation. The inversion law states that double inversion of a variable results in the original variable itself.

$$\overline{\overline{A}} = A$$

NOT Law

Important Boolean Theorems

Boolean function/theorems Description

Boolean Functions

Boolean Functions and Expressions, K-Map and NAND Gates realization

De Morgan's Theorems

De Morgan's Theorem 1 and Theorem