Boolean Algebra :

The ckt. in digital computers follow the logic of minds. This logic is binary (0 & 1) and resembles ordinary algebra called Boolean Algebra. There are three operations :-

(i) OR addition represented by a (+) sign.
(ii) AND multiplication represented by (X) or (•) sign.
(iii) NOT operation is represented by a bar over a variable.

OR Addition.

$$Y = A + B$$

for n - inputs

$$Y = A + B + C + \cdots + n.$$

Rules ↓

0 + 0 = 0
0 + 1 = 1
1 + 0 = 1
1 + 1 = 1

AND multiplication: ↓

$$Y = A \cdot B$$

for n-inputs

$$Y = A \cdot B \cdot C \cdot \cdots N$$

Rules: ↓

$0 \cdot 0 = 0$
$0 \cdot 1 = 0$
$1 \cdot 0 = 0$
$1 \cdot 1 = 1$

NOT operation :-

$$Y = \overline{A} = A'$$

Rules.

$\overline{0} = 1$
$\overline{1} = 0$