Laws and Rule of Boolean Algebra

- Commutative Laws:-
  - The Commutative Law of addition for two variable.

$$A + B = B + A$$

- The Commutative Law of multiplication for two variable.

$$A \cdot B = B \cdot A$$

- Associative Laws:-
  - The Associative law of addition is written as

$$A \cdot (B + C) = A \cdot B + A \cdot C$$

- The Associative law of addition is written as

$$A \cdot (B \cdot C) = (A \cdot B) \cdot C$$

- Distributive Law:-

$$A \cdot (B + C) = A \cdot B + A \cdot C$$

BOOLEAN ALGEBRA

AND rules

$$A \cdot A = A$$

$$A \cdot \overline{A} = 0$$

$$0 \cdot A = 0$$

$$1 \cdot A = A$$

$$A \cdot B = B \cdot A$$

$$A \cdot (B \cdot C) = (A \cdot B) \cdot C$$

$$A \cdot (B + C) = A \cdot B + A \cdot C$$

$$\overline{A} \cdot \overline{B} = \overline{A + B}$$

" Proof ":

A B C	A· (B+C)	A·B+A·C
0 0 0	0	0
0 0 1	0	0
0 1 0	0	0
0 1 1	0	0
1 0 0	0	0
1 0 1	1	1
1 1 0	1	1
1 1 1	1	1

BOOLEAN ALGEBRA ... continued

OR rules

$A + A = A$

$A + \overline{A} = 1$

$0 + A = A$

$1 + A = 1$

$A + B = B + A$

$A + (B + C) = (A + B) + C$

$A + B \cdot C = (A + B) \cdot (A + C)$

$\overline{A} + \overline{B} = \overline{A \cdot B}$

A B C	$A + B \cdot C$	$(A+B) \cdot (A+C)$
0 0 0	0	0
0 0 1	0	0
0 1 0	0	0
0 1 1	1	1
1 0 0	1	1
1 0 1	1	1
1 1 0	1	1
1 1 1	1	1