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Course:- logic design

Topic:- Boolean eqn's for Digital ckt's,
Decoders, & Mux

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* In 1854, george Bool Developed a algebraic system called Boolean Algebra.

* Boolean Algebra is a system of Mathematical logics

* It is defined With a set of elements a set of operators and a no.of postulates

* There are 4 laws of Boolean Algebra:-

1) **Commutative law:-**

$$X + Y = Y + X.$$
$$A + B = B + A.$$
$$X \cdot Y = Y \cdot X$$
$$A \cdot B = B \cdot A.$$

2) **Associative law:-**

$$X + (Y + Z) = (X + Y) + Z$$
$$A + (B + C) = (A + B) + C.$$
$$X \cdot (Y \cdot Z) = (X \cdot Y) \cdot Z$$
$$A \cdot (B \cdot C) = (A \cdot B) \cdot C.$$

3) **Distribution law:-**

$$X(Y + Z) = XY + YZ$$
$$A(B + C) = AB + AC.$$

4) **Absorption Theorem:-**

$$X + XY = X.$$
$$A + AB = A.$$
$$X + \sim X Y = X + Y.$$

* Mux to Logic gates conversion:-

1) NAND, NOR, universal gates.

2) Mux and decoders are called universal logic.

=> Mux is devices Which selects one or several digital/Analog I/ps and it will forward it to the o/p lines, Which is single o/p lines.

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