



Semester – V

BRANCH	Subject	Subject Code
B.Sc. (Maths)	Fundamentals of Boolean Algebra (Theory)	MADSE1-151

Course Learning Outcomes (CLO)

The course will enable the students:

1. Using the Boolean algebra in logical problems.
2. Minimize the Boolean Function using Karnaugh Map.
3. Understanding the various logic gates.
4. Applying the circuits in logical problems..

Unit – I

1.1 Indian logic

1.1.1 Origins

1.1.2 The schools Vaisheshika

1.1.3 Catuskoti

1.1.4 Nyaya

1.1.5 Jain logic

1.1.6 Buddhist logic

1.1.7 Navya-Nyaya

1.1.8 Influence of Indian logic on modern logic

1.1.9 Boolean Logic and Indian Thoughts

1.2 Boolean Algebra:

1.2.1 Truth Tables



1.2.2 Properties of Boolean Algebra

1.2.3 Principle of Duality

1.2.4 De Morgan's Theorem

Unit – II

Boolean Function:

2.1 Boolean Expression 2.2 Boolean Function

2.3 Min-term or Minimal Boolean Function

2.4 Disjunctive Normal Form or Canonical Form

2.5 Complete Disjunctive Normal Form or Complete Canonical Form

2.6 Boole's Expansion Theorem

2.7 Complement Function of a Boolean Function in Disjunctive Normal Form

2.8 Max-term or Maximal Boolean Function

2.9 Conjunctive Normal Form or Dual Canonical Form

2.10 Complete Conjunctive Normal Form

2.11 Complement Function of a Boolean Function in Conjunctive Normal Form

2.12 SOP & POS Forms

2.13 Minimize the Boolean function using Karnaugh-Map up to 3 variables,

Unit – III

Logic Gates:

3.1 AND Gate

3.2 OR Gate

3.3 NOT Gate

3.4 NAND Gate

3.5 NOR Gate



3.6 XOR Gate

3.7 XNOR Gate

3.8 Buffer Gate

3.9 Universal Gate

1.10 Application of Logic Gates

Unit – IV

Circuits:

4.1 Switching Circuits

4.2 Parallel Cir

4.3 Series Circuits

44 Relay Circuit

4.5 Various Positions of Switches and Currents in Electric Circuits

4.6 Simple Arithmetic and Logic Circuits

47 Combinational Circuits

4.7.1 Adder

4.7.2 Sub tractor

4.8 Simple Combinational Circuit Design Problems

Test Books:-

1. J.P.Tremblay and R.Manohar: Discrete Mathematical Structures with Application to computer Science
2. C. L. Liu: Elements of Discrete Mathematics
3. Satinder Bal Gupta and C. P. Gandhi: Discrete Structure