19BSM701T - DISCRETE MATHEMATICS										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	1	--	4	4	25	50	25	--	--	100

OBJECTIVES

1. To understand the concept of recursive functions and its solution
2. To learn about truth tables for validation of propositions.
3. To study about finite state machine.
4. To study about Boolean algebra and logic gates.

SYLLABUS

Unit-I	**09**

Recursive Functions: Recursive function, recurrence relations (nth order recurrence relation with constant coefficients, Homogeneous recurrence relations, Inhomogeneous recurrence relation), generating function (closed form expression, properties of G.F., solution of recurrence relation using G.F)

UNIT II	**09**

Propositional logic: Proposition logic, basic logic, logical connectives, truth tables, tautologies, contradiction, normal forms (conjunctive and disjunctive), modus ponens and modus tollens, validity, predicate logic, universal and existential quantification. contrapositive, negation, and contradiction, direct proof, proof by using truth table.

UNIT III	**10**

Languages, Grammars, Machines: Alphabets and Words, Languages, Operations on Languages, Regular Languages, Finite State Automata, Grammars, Types of Grammars, Finite State Machine, State Diagram.

UNIT IV	**11**

Boolean Algebra: Basic definitions, Duality, Boolean algebra as Lattices, SoP form for Sets, SoP form for Boolean algebra, Minimal Boolean expressions, Minimal SoP Form, Logic Gates and Circuits, Karnaugh maps.

UNIT-V	**13**

Useful NPTEL Lectures Link:

(1) https://nptel.ac.in/courses/106106094/

(2) https://nptel.ac.in/courses/111107058/

(3) https://nptel.ac.in/courses/111106086/

(4) https://nptel.ac.in/courses/106106183/

APPROXIMATE TOTAL	**52 Hours**

OUTCOMES	
1. Understand the concepts of logic and truth table. 2. Formation of mathematical model using recursive relations in different real life applications. 3. Use formal methods for constructing mathematical proofs. 4. To understand finite state automata and machines. 5. To understand Boolean algebra and minimizing circuit with K-maps	
TEXTS AND REFERENCES	
1. Lipschutz, S., Lipson, M., Discrete Mathematics, Schaum Series (TMH) 1997. 2. Rosen and Kenneth H., Discrete Mathematics and It's Applications, Tata McGraw Hill, 1999. 3. Kolman, B., Busby, R.C., Ross S., Discrete Mathematical Structures, Prentice Hall, 2009. 4. Koshy, T. Discrete Mathematics with Applications, Academic Press, 2003. 5. Gramaldi, R. P., Discrete and Combinatorial Mathematics, 5th Ed, Pearson Education, 2004. C. L. Liu, Mohapatra, D.P., Elements of Discrete Mathematics, 4th Ed., Tata McGraw Hill, 2012.	