MAMDC 244T: Discrete Mathematics

Semester: IV	Course Title: Discrete Mathematics	Credit: 2
Course No.: 244 T	MINOR(T)	Hours: 2/week

COs with cognitive Abilities:

COs	COGNITIVE ABILITIES	COURSE OUTCOMES
CO1	REMEMBERING	Learn discrete mathematics concepts, terminologies, and symbolic notations.
CO2	UNDERSTANDING	The role that discrete mathematical structures play in computer science and in real-world applications.
CO3	APPLYING	Apply properties to classify and interpret relationships, such as equivalences, partial orders and Boolean expression.
CO4	ANALYSING	Utilize discrete structures such as graphs, trees, and Boolean algebra to break complex problems down into smaller subproblems
CO5	EVALUATING	Identify the properties of discrete structures that are suitable for solving specific problems
CO6	CREATING	Design mathematical models using graphs or logic for solving advanced computational problems

CO-PO Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1					
CO 2					
CO 3					
CO 4					
CO 5					
CO 6					

Unit	Detailed Syllabus	No. of Hours of Teaching
I	**Relations and Partially Ordered Sets (Posets)** An introduction to relations, and various types such as reflexive, symmetric, transitive, antisymmeteic and equivalence relations, various presentations of relations, applications of relations in different fields. Partially ordered sets (Posets), Chain, Hasse diagram as a graphical representation of posets and examples, as well as critical concepts like upper and lower bounds, supremum, and infimum.	15
II	**Lattices and Boolean Algebra** Lattices, distributive and bounded lattices, sub-lattices, complete lattices, and complemented lattices. Lattice -isomorphism. Stone′s representation theorem. Applications of lattices in computer science, Boolean algebra with its properties. Boolean functions using Boolean expressions. Applications of Boolean algebra in logic circuit design and switching theory.	15

Suggested Reference Books:

1) Discrete Mathematical Structures with Applications to Computer Science by J.P. Tremblay and R. Manohar. Publisher: McGraw Hill Education.
2) Mathematical Foundation of Computer Science by Ramesh Kataria and Dr K R Kachhot. Publisher: Mahajan publishing house.
3) Discrete Mathematics" by S. Chakraborty and B.K. Sarkar, Publisher: Oxford Publishing.
4) Discrete Mathematics by Swapan Kumar Sarkar Publisher: S. Chand Publishing.
5) Discrete Mathematics and Its Applications" by K.C. Joshi Publisher: New Age International Publishers.

MAMDC 244 P: Discrete Mathematics Practical

Semester: IV	Course Title: Discrete Mathematics Practical	Credit: 2
Course No.: 244 P	MINOR(P)	Hours: 4/week

COs with Cognitive Abilities

COs	COGNITIVE ABILITIES	COURSE OUTCOMES
CO1	REMEMBERING	Recognize discrete mathematical notations and terminologies.
CO2	UNDERSTANDING	Translate discrete mathematical expressions into problem-solving contexts.
CO3	APPLYING	Solve real-world problems using combinatorics, graph algorithms, and Boolean algebra
CO4	ANALYSING	Apply algorithms and optimise computational operations by using discrete mathematical techniques.
CO5	EVALUATING	Examine several discrete models to see if they can be used in real-world situations
CO6	CREATING	Use discrete structures to create creative solutions, such building network models or cryptographic methods

CO-PO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1					
CO 2					
CO 3					
CO 4					
CO 5					

(Manual/Computer)

Sr. No.	Title of the Practical	No. of Hours of Teaching
1.	Examples on relations	5
2.	Examples based on relation properties	5
3.	Examples on equivalence relation	5
4.	Representation of relations through matrices and graphs	5
5.	Examples on partial ordering & total ordering	5
6.	Hasse Diagram – Posets	5
7.	Hasse Diagram – Lattices	5
8.	Examples of various types of Lattice	5
9.	Lattices isomorphism	5
10.	Examples of Boolean algebra	5
11.	Stone′s representation theorem	5
12.	Equivalent Boolean expressions	5

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Publisher: Oxford Publishing.
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