



Indraprastha College for Women University of Delhi

Work Plan for ODD SEMESTER – 2026

Course Name:	B.Sc.(H) Mathematics
Paper Title:	Discrete Mathematics
Unique Paper Code:	2352012303
Semester:	III
Faculty:	Dr. Suman
Year:	2026

V		
Unit No.	Learning Objective	Topics to be Covered
1	Set and Function	Review of Set Theory Language of Mathematics Reviews of Functions
1	Boundedness And Isomorphism	Reviews of boundedness Definitions, examples and basic properties of partially ordered sets Order-isomorphisms and Homo.
1	Graph	Covering relations, Hasse diagrams. Dual of an ordered set Duality principle.
1	Maximality	Bottom and top elements, Maximal and minimal elements Zorn's lemma and its uses.
1	Ordering	Building ordered set. Maps between ordered sets. Covered Set and Theorem
3	M-N Concept	M3 – N5 theorem with applications
3	Properties of Lattice	Complemented lattice. Complemented lattice. Relatively complemented lattice.

3	Properties of Lattice	Relatively complemented lattice. Relatively complemented lattice. Sectionally complemented lattice.
3	Properties of Lattice	Sectionally complemented lattice. Complement on Product Lattice.
3	Homomorphism	Boolean algebras De Morgan's laws Boolean homomorphism
		MID SEMESTER BREAK
3	Boolean Function	Representation theorem. Boolean polynomials. Boolean polynomial functions
3	Boolean Function	Equivalence of Boolean polynomials. Disjunctive normal form and conjunctive normal form of Boolean polynomials. Minimal forms of Boolean polynomials.
3	Boolean Grap	Quine-McCluskey method. Karnaugh diagrams. Switching circuits.
3		Applications of Boolean algebras to logic. Set theory. Probability theory.

Unit	Contents/Syllabus
I	Cardinality and Partially Ordered Sets The cardinality of a set; Definitions, examples and basic properties of partially ordered sets, Order-isomorphisms, Covering relations, Hasse diagrams, Dual of an ordered set, Duality principle, Bottom and top elements, Maximal and minimal elements, Zorn's lemma, Building new ordered sets, Maps between ordered sets.
II	Lattices Lattices as ordered sets, Lattices as algebraic structures, sublattices, Products, Lattice isomorphism; Definitions, examples and properties of modular and distributive lattices; The M3 – N5 theorem with applications, Complemented lattice, Relatively complemented lattice, Sectionally complemented lattice.

III	Boolean Algebras and Applications Boolean algebras, De Morgan's laws, Boolean homomorphism, Representation theorem, Boolean polynomials, Boolean polynomial functions, Equivalence of Boolean polynomials, Disjunctive normal form and conjunctive normal form of Boolean polynomials; Minimal forms of Boolean polynomials, Quine-McCluskey method, Karnaugh diagrams, Switching circuits and applications, Applications of Boolean algebras to logic, set theory and probability theory.
S. No.	Name of Authors/Books/Publishers
1.	Davey, B. A., & Priestley, H. A. Introduction to Lattices and Order (2nd ed.). Cambridge University press, Cambridge, 2002.
2.	Goodaire, Edgar G., & Parmenter, Michael M.. Discrete Mathematics with Graph Theory (3rd ed.). Pearson Education Pvt. Ltd. Indian Reprint,2006.
3.	Lidl, Rudolf & Pilz, Gunter. Applied Abstract Algebra (2nd ed.), Undergraduate Texts in Mathematics. Springer (SIE). Indian Reprint,2004.
4.	Donnellan, Thomas. Lattice Theory (1st ed.). Khosla Pub. House. Indian Reprint,1999

	Paper Components		
Credits	Lecture (L)	Tutorial (T)	Practical (P)
Assessment Scheme			
S.No.	Component	Marking Scheme	Total Marks
1	Internal Assessment	12	30
	• Assignment	12	
	• Class Test	6	
	• Attendance		
2.	Continuous Assessment (Tutorial)		
	• Activity 1		
	• Activity 2		
	• Attendance		
3.	Practical		40
	• Continuous Assessment	10	
	• End Term Written/Practical Exam	20	
		10	

	• Viva		
4.	End Semester Examination		90