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SET THOERY AND LOGIC GIVE FULL SYLABUS AND GROUP THERY
IN TABLEFORM

Here’s a structured syllabus for **Set Theory, Logic, and Group Theory** in a **table format**.

1. Set Theory Syllabus

Topic	Subtopics
Basic Set Concepts	Definition, Types of Sets (Empty, Finite, Infinite, Equal, Subset, Power Set, Universal Set)
Set Operations	Union, Intersection, Difference, Complement, Symmetric Difference
Algebra of Sets	Laws of Set Theory (Associative, Commutative, Distributive, De Morgan’s Laws)
Cartesian Product & Relations	Ordered Pairs, Cartesian Product, Types of Relations (Reflexive, Symmetric, Transitive, Equivalence Relations)
Functions & Mappings	Injective, Surjective, Bijective Functions, Composition of Functions, Inverse Functions
Cardinality & Countability	Finite & Infinite Sets, Countable & Uncountable Sets, Cantor’s Theorem
Axiomatic Set Theory	Zermelo-Fraenkel Axioms (ZF), Choice Axiom (AC), Russell’s Paradox, Ordinals & Cardinals

2. Mathematical Logic Syllabus

Topic	Subtopics
Propositional Logic	Statements, Logical Connectives, Truth Tables, Tautology, Contradiction, Logical Equivalence
Predicate Logic	Quantifiers (Universal, Existential), Validity, Soundness, Completeness
Proof Techniques	Direct Proof, Indirect Proof, Proof by Contradiction, Mathematical Induction
Boolean Algebra	Boolean Functions, Normal Forms (CNF, DNF), Simplification Using Karnaugh Maps
Formal Systems	Axioms, Theorems, Deductive Systems, Gödel’s Incompleteness Theorem

3. Group Theory Syllabus

Topic	Subtopics
Introduction to Groups	Definition, Examples (Integers, Matrices, Permutations), Abelian & Non-Abelian Groups
Group Properties	Closure, Associativity, Identity, Inverse
Subgroups	Cyclic Subgroups, Cosets, Lagrange’s Theorem
Normal Subgroups & Quotient Groups	Kernel, Image, Normal Subgroups, Factor Groups
Group Homomorphisms	Definition, Isomorphism, Automorphism, Cayley’s Theorem
Symmetry Groups & Applications	Permutation Groups, Dihedral Groups, Applications in Cryptography & Physics

This structured syllabus provides **set theory, logic, and group theory** in a **systematic table format** for easy understanding. Let me know if you need **detailed explanations** on any topic! 🚀