**Lesson Plan**

Name of the Faculty : Ms. Ritu Khurana

Discipline : CSE/IT

Semester : 4th

Subject : Discrete Mathematics

Lesson Plan Duration : 15 weeks (From January, 2019 to April 2019)

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| **Week** | **Theory** |
| **Lecture Day** | **Topic** |
| **1st** | **1st** | * Operations and Laws of Sets
* Cartesian Products

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| **2nd** | * Binary Relations
* Partial Ordering Relation
 |
| **3rd** | * Equivalence Relation
* Image of a set
* Types of Functions
* Inverse and Composite Function
 |
| **2nd** | **4th** | * Size of a set
* Cantor’s Diagonal Argument and Power Set Theorem
 |
| **5th** | * Schroeder-Bernstein Theorem
 |
| **6th** | * Well Ordering Principle
* Recursive Definition
 |
| **3rd** | **7th** | * Division Algorithm: Prime Numbers
* Greatest Common Divisor: Euclidean Algorithm
 |
| **8th** | * Fundamental Theorem of Arithmetic
 |
| **9th** | * Inclusion and Exclusion
* Pigeon-hole Principle
 |
| **4th** | **10th** | * Permutation
 |
| **11th** | * Combination
 |
| **12th** | * Syntax and Semantics of Propositional Logic
 |
| **5th** | **13th** | * Validity and Satisfiability
 |
| **14th** | * Basic Connectives and Truth Tables
 |
| **15th** | * Laws of Logic
* Logic Implication
 |
| **6th** | **16th** | * Rules of Inference
 |
| **17th** | * Use of Quantifiers
 |
| **18th** | * Proof Techniques: Terminology, Proof Methods and Strategies
 |
| **7th** | **19th** | * Forward Proof
* Proof by Contradiction
 |
| **20th** | * Proof by Contraposition
* Proof of Necessity and Sufficiency.
 |
| **21st** | * Algebric Sturctures with one Binary Operation
 |
| **8th** | **22nd** | * Semigroups, Monoids,Groups
 |
| **23rd** | * Congruence Relation and Quotient Structures
 |
| **24th** | * Free and Cyclic Groups
 |
| **9th** | **25th** | * Permutation Groups
 |
| **26th** | * Substructures, Normal Subgroups
 |
| **27th** | * Rings
 |
| **10th** | **28th** | * Integral Domain and Fields
 |
| **29th** | * Boolean Algebra and Ring
 |
| **30th** | * Identities of Boolean Algebra
 |
| **11th** | **31st** | * Duality, Representation of Boolean Function
 |
| **32nd** | * Disjunctive and Conjunctive Normal form.
 |
| **33rd** | * Graphs and their Properties
 |
| **12th** | **34th** | * Degree, Connectivity, Path, Cycle, Sub Graph
 |
| **35th** | * Isomorphism, Eulerian and Hamiltonian Walks
 |
| **36th** | * Graph Colouring
* Colouring Maps
 |
| **13th** | **37th** | * Planer Graphs
* Colouring Vertices and edges
 |
| **38th** | * List Colouring
 |
| **39th** | * Perfect Graph and its Properties
 |
| **14th** | **40th** | * Rooted Trees, weighted trees
 |
| **41st** | * Prefix codes
 |
| **42nd** | * Biconnected Component
 |
| **15th** | **43rd** | * Articulation Points
 |
| **44th** | * Shortest Distances
 |
| **45th** | * Revision
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