RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Teaching & Examination Scheme
B.Tech. : Information Technology
2nd Year - IV Semester

SN	Category	Course Code	Course Title	L	T	P	Exm Hrs	IA	ETE	Total	Cr
THEORY											
1	BSC	4IT2-01	Discrete Mathematics Structure	3	0	0	3	30	120	**150**	**3**
2	HSMC	4IT1-03/ 4IT1-02	Managerial Economics and Financial Accounting / Technical Communication	2	0	0	2	20	80	**100**	**2**
3	ESC	4IT3-04	Principle of Communication	3	0	0	3	30	120	**150**	**3**
4	PCC	4IT4-05	Database Management System	3	0	0	3	30	120	**150**	**3**
5	PCC	4IT4-06	Theory of Computation	3	0	0	3	30	120	**150**	**3**
6	PCC	4IT4-07	Data Communication and Computer Networks	3	0	0	3	30	120	**150**	**3**
			Sub Total	17	0	0		170	680	**850**	**17**
PRACTICAL & SESSIONAL											
8	PCC	4IT4-21	Linux Shell Programming Lab	0	0	2		30	20	**50**	**1**
9	PCC	4IT4-22	Database Management System Lab	0	0	3		45	30	**75**	**1.5**
10	PCC	4IT4-23	Network Programming Lab	0	0	3		45	30	**75**	**1.5**
11	PCC	4IT4-24	Java Lab	0	0	2		30	20	**50**	**1**
12	PCC	4IT4-25	Web Technology Lab	0	0	2		30	20	**50**	**1**
13	SODECA	4IT8-00	Social Outreach, Discipline & Extra Curricular Activities							**25**	**0.5**
			Sub- Total	0	0	12		180	120	**325**	**6.5**
			TOTAL OF IV SEMEESTER	17	0	12		350	800	**1175**	**23.5**

*L: Lecture, **T:** Tutorial, **P:** Practical, **Cr:** Credits*

*ETE: End Term Exam, **IA:** Internal Assessment*

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

4IT2-01: Discrete Mathematics Structure

Credit: 3 **Max. Marks: 150(IA:30, ETE:120)**
3L+0T+0P **End Term Exam: 3 Hours**

SN	Contents	Hours
1	**Introduction:** Objective, scope and outcome of the course.	1
2	Set Theory: Definition of sets, countable and uncountable sets, Set operations, Partition of set, Cardinality (Inclusion-Exclusion & Addition Principles) Venn Diagrams, proofs of some general identities on sets. Relation: Definition, types of relation, composition of relations, Pictorial representation of relation, Equivalence relation, Partial ordering relation, Job-Scheduling problem. Function: Definition, type of functions, one to one, into and onto function, inverse function, composition of functions, recursively defined functions, pigeonhole principle. Theorem proving Techniques: Mathematical induction, Proof by contradiction. Composition of Functions. The Pigeonhole and Generalized Pigeonhole Principles.	7
3	Propositional Logic: Proposition, First order logic, Basic logical operation, truth tables, tautologies, Contradictions, Algebra of Proposition, logical implications, logical equivalence, predicates, Normal Forms, Universal and existential quantifiers. 2 way predicate logic. Introduction to finite state machine Finite state machines as models of physical system equivalence machines, Finite state machines as language recognizers.	8
4	Posets, Hasse Diagram and Lattices: Introduction, ordered set, Hasse diagram of partially, ordered set, isomorphic ordered set, well ordered set, properties of Lattices, bounded and complemented lattices. Combinatorics: Introduction, Permutation and combination, Binomial Theorem, Multimodal Coefficients Recurrence Relation and Generating Function: Introduction to Recurrence Relation and Recursive algorithms, linear recurrence relations with constant coefficients, Homogeneous solutions, Particular solutions, Total solutions, Generating functions, Solution by method of generating functions.	8
5	Algebraic Structures: Definition, Properties, types: Semi Groups, Monoid, Groups, Abelian group, properties of groups, Subgroup, cyclic groups, Cosets, factor group, Permutation groups, Normal subgroup, Homomorphism and isomorphism of Groups, example and standard results, Rings and Fields: definition and standard results.	8
6	Graph Theory: Introduction and basic terminology of graphs, Planer graphs, Multigraphs and weighted graphs, Isomorphic graphs, Paths, Cycles and connectivity, Shortest path in weighted graph, Introduction to Eulerian paths and circuits, Hamiltonian paths and circuits, Graph coloring, chromatic number, Isomorphism and Homomorphism of graphs, matching, vertex/edge covering.	8
	Total	40