PAPER : MCA31 Data Structures

Examination Scheme					
Internal		External		Total	
Th. (Marks)	Pr. (Marks)	Th. (Marks)	Pr. (Marks)	Th. (Marks)	Pr. (Marks)
30	20	70	30	100	50

UNIT I (25%)

What is data structure? Why we study data structure? Efficiency of a Programme, Type of Data Structures, Common Operations Performed on Data Structures. Primitive and Non-Primitive Data Structures. Storage Representation of integer and real numbers, Linear data Structures and their sequential Storage Representation Arrays, Stacks, Queues. , Operations on Linear Data Structures, Applications of Stack.

UNIT II (25%)

Linear Data structures and their Linked Storage Representation: Pointers & Linked Allocation, Linked Linear Lists-Singly Linked List, Circularly Linked List, Doubly Linked List, Operations on Linked Lists, Applications of Linked Linear Lists.

UNIT III (25%)

Non-linear Data Structures: Trees-definition and concept, Operations on Binary Trees, Storage representation of a Binary Tree, Conversion of general Trees to Binary Trees, Applications of Trees (Manipulation of arithmetic Expressions only), Graphs- Definitions, Representations (Only Matrix and Linked representations), BFS, DFS, Spanning Tree & Minimal Spanning Tree – Definitions only

UNIT IV (25%)

Sorting Techniques: Notation and Concepts, Selection Sort, Bubble Sort, Merge Sort, Partition-exchange Sort, Radix Sort, comparison of the sorting techniques.

Searching Techniques: Sequential Search, Binary Search, Hashing functions for storing and searching, Collision and it's Resolution techniques.

Books :

1. An Introduction to Data Structures with Applications – Tremblay & Sorenson Question Paper Scheme:

Section – I		Section – II	
Q.1 - Objective Type Unit I & II	(11) Marks	Q.4 - Objective Type Unit III & IV	(11)Marks
Q.2 - Unit-I OR Q.2 Unit-I	(12) Marks	Q.5 - Unit-III OR Q.5 Unit-III	(12) Marks
Q.3 - Unit-II OR Q.3 Unit-II	(12) Marks	Q.6 - Unit-IV OR Q.6 Unit-IV	(12) Marks

Practical List

1. Operations on queue – Insert, Delete
2. Operations on stack – Push, Pop, Peep, change
3. Conversion of an Arithmetic Expression Written into Infix Notation to Expression in Postfix Notation. (Non-Recursive)
4. Counting of N! using stack concept (Non-Recursive and Recursive)
5. Operations on lists – Singly Linked List, Circularly Linked List, Doubly Linked List. (Insertion and Deletion Operations)
6. Operations on Binary Tree (Traversal-Pre order, In order, Post order, Insertion and Deletion)
7. Sort an array using Selection Sort
8. Sort an array using Bubble Sort
9. Sort an array using Merge Sort
10. Sort an array using Quick Sort