Data Structures – Syllabus

SECTION-A

Complexity Analysis: Time and Space complexity of algorithms, asymptotic analysis, big O and other notations, importance of efficient algorithms, program performance measurement, data structures and Algorithms.

Linear Lists: Abstract data type, sequential and linked representations, comparison of insertion, deletion and search operations for sequential and linked lists, list and chain classes, doubly linked lists, circular linked lists, applications of lists in bin sort, radix sort, sparse tables.

Stacks and Queues: Abstract data types, sequential and linked implementations, representative applications such as parenthesis matching, towers of Hanoi.

Sorting: Bubble sort, selection sort, insertion sort, Shell sort, Quick sort, Heap sort, Merge sort; Radix sort, Analysis of the sorting methods, Selecting the top k elements.

SECTION-B

Trees: Binary trees and their properties, terminology, sequential and linked implementations, tree traversal methods and algorithms, Heap data structure and its applications as priority queues, heap implementation, insertion and deletion operations, Heapsort.

Search & Multi-way Trees: Binary search trees, search efficiency, insertion and deletion operations, importance of balancing, AVL trees, B-trees, B+ trees.

Graphs: Definition, terminology, directed and undirected graphs, properties, connectivity in graphs, applications, implementation – adjacency matrix and linked adjacency chains, graph traversal - breadth first and depth first, spanning trees.

Hashing: hashing as a search structure, hash table, collision avoidance, linear open addressing, chaining.