

Roll No.

Total Pages : 3

BCA/M-15

19014

DATA STRUCTURES

Paper-BCA-202

Time Allowed : 3 Hours]

[Maximum Marks : 80

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) What do you mean by Data structure?
- (b) What is big-O notation?
- (c) How Linear array is represented in Computer memory?
- (d) What is the need of Two-way linked list?
- (e) What is Recursion?
- (f) Enlist any four applications of Queue.
- (g) How Binary tree is stored in Computer memory?
- (h) Define Directed and Undirected graph. $8 \times 2 = 16$

UNIT-I

2. (a) What are the various applications of Data structures? 8

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- (b) Discuss various operations that can be applied on various Data structures. 8
3. Write down any two algorithms for pattern matching and explain with appropriate examples. Compare both the algorithms. 16

UNIT-II

4. (a) Differentiate between Array and Linked list. 6
- (b) What is Sparse matrix? How sparse matrices and stored in Computer memory? Explain with suitable examples. 10
5. (a) Write down the algorithm for searching in a Linked list. 8
- (b) Write down the algorithm for inserting an element in Doubly linked list. 8

UNIT-III

6. Explain the memory representations of Stack using both arrays and linked list. Also write the algorithm for insertion and deletion in a stack using both the techniques. 16
7. (a) What is Deque? How can we insert and delete and element in a deque? 8
- (b) What is Priority queue? Explain the memory representation of priority queue in Computer memory. 8

UNIT-IV

8. Write an algorithm for traversing a tree using postorder traversal. Also explain the same with the help of suitable example. 16
9. What do you understand by Graph? Explain the memory representation of graphs with the help of appropriate examples. How can you find shortest path in a graph? 16