Roll No. .....

(05/25)

14312

B.C.A. EXAMINATION

(For Batch 2021 to 2023 Only)

(Second Semester)

DATA STRUCTURE

BCA-22

Time : Three Hours *Maximum Marks :* 80

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. Attempt all parts : 16

   (a) Define Time and Space complexity of an algorithm.

   (b) Compare Linear and Binary search method.

(c) Define Dynamic data structures.

(d) What is circular queue ?

(e) Define the term Binary Search Tree.

(f) Compare BFS and DFS.

(g) Define the structure of Doubly Linked list.

(h) Write the applications of Stack.

Unit I

2. (a) Explain the various types of data structures. 8

   (b) Write Selection sort algorithm and explain with example. 8

3. What is Array and explain the type of arrays. Write an algorithm for Binary Search in an array. 16

Unit II

4. Explain the concept of a stack. Describe the operations performed on a stack (push, pop) with suitable algorithms and examples. 16

5. Discuss the following : 16

   (a) Priority Queue

   (b) Quick sort.

Unit III

6. What is a linked list ? Explain the insertion and deletion operations in a singly linked list with algorithms and diagrams. 16

7. Write short notes on the following : 16

   (a) Doubly Linked List

   (b) Circular Linked List.

Unit IV

8. Define a tree and explain its basic terminologies (root, parent, child, siblings, height, depth, leaf node). Also, explain the different types of binary tree traversals (inorder, preorder, postorder) with examples. 16

9. Explain Depth First Search (DFS) and Breadth First Search (BFS) algorithms for graph traversal. Write algorithms and provide example graphs. 16

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