A–0788

Total Pages : 3 **Roll No. .....**

BCA-06

Bachelor of Computer Application (BCA)

(Data Structure Through C Language)

Examination, June 2025

Time : 2:00 Hrs. Max. Marks : 70

Note* :–** This paper is of Seventy (70) marks divided into Two (02) Sections 'A' and 'B'. Attempt the questions contained in these sections according to the detailed instructions given therein. ***Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

Section–A

(Long Answer Type Questions) 2×19=38

***Note* :–** Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any *two* (02) questions only.

1. Compare the array-based and linked list-based implementations of queues. Also, explain circular queues and their advantages with an example.

2. Explain the working of linear and binary search algorithms. Discuss their performance in terms of time complexity using Big-O notation.

3. Describe and implement the following sorting algorithms : Bubble Sort, Insertion Sort. Compare their time and space complexities, explain in which scenarios each is most suitable.

4. Explain the different types of tree traversal algorithms (inorder, preorder, postorder) with examples.

5. Describe the algorithms for searching, insertion in a Binary Search Tree.

Section–B

(Short Answer Type Questions) 4×8=32

***Note* :–** Section 'B' contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. What is a linked list ? Explain the structure and representation of a singly linked list in detail. Discuss the advantages of linked lists over arrays.
2. Discuss the deletion operations on a singly linked list. Explain with help of examples.
3. Explain the Breadth First Search (BFS) traversal techniques.
4. What is quick sort ? Explain with help of example.
5. What is the application of stack and queue ?
6. Explain the memory representation of a two-dimensional array using the row-major and column-major order with an example.
7. Provide an example to explain how time complexity is calculated using Big-O notation.
8. Describe the process of inserting a new node at the beginning, of a singly linked list.

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