A–1263

Total Pages : 4 **Roll No. .....**

BCA-06

Bachelor of Computer Application (BCA)

Data Structure Through C Language

Examination February, 2026

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. Define stack. Explain stack implementation using both arrays and linked lists with algorithms for push and pop.

2. Explain the classification of data structures and compare linear and non-linear data structures with suitable examples.

3. Define a graph. Explain graph representation using Adjacency Matrix and Adjacency List, and compare both.

4. Explain the working of priority queues. Describe how they can be implemented using linked lists or arrays.

5. Write short notes on :

   (a) Algorithm complexity (Time and Space)

   (b) Applications of stack

   (c) Tree traversal techniques (Inorder, Preorder, Postorder)

   (d) Queues

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. Define a binary tree. Explain different types of binary trees and their memory representation using linked structures.

2. Write the formula for the address calculation of ID array elements stored in memory.

3. Write short notes on :

   (a) Best-case complexity

   (b) Worst-case complexity

4. Convert the following expression to postfix :

   (A + B) *(C + D)

5. State two advantages and two disadvantages of bubble sort.

6. Write an algorithm to search for an element in a singly linked list.

7. Explain the structure of a B-tree. Describe the rules for insertion and searching in B-tree nodes.

8. Explain the Depth First Search (DPS) traversal technique.

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