

Dr. Babasaheb Ambedkar Open University

Term End Examination July – 2026

Course: BCAMA/BCAOL

Date: 07-07-2026

Subject Name: Data Structure Using C

Time: 03:00pm to 05:15pm

Subject Code: BCAMA-202/ BCAOL -202

Total Marks: 70

Section A

Answer the following (Attempt any three)

30 Marks

1. Define Data Structure. Explain the difference between linear and non-linear data structures with appropriate examples.
2. What is an array? Explain its static and dynamic initialization methods examples.
3. Explain the Linked List data structure. How to insert a node at the beginning of a singly linked list?
4. What is a Stack? Describe the array-based implementation of Stack with 'push' and 'pop' operations with overflow and underflow conditions.
5. Differentiate the BFS and DFS graph traversal methods in detail.

Section B

Answer the following (Attempt any four)

20 Marks

1. Differentiate between Linear and Non-Linear data structures with examples.
2. Define a Graph. Explain graph terminologies in brief.
3. Differentiate between Linear Search and Binary Search techniques. Under what conditions is Binary Search preferred?
4. What is a Sparse Matrix? How to represent it?
5. Explain Doubly Linked List and its node structure with example.
6. What is a Circular Queue? Explain with appropriate example.

Section C

Part – A (Multiple Choice Questions)

10 Marks

1. Which of the following is an unstructured raw material for a computer system?
A. Information B. Data
C. System D. Knowledge
2. If we declare 'int x[3][5]', how many total elements can the array store?
A. 8 B. 15
C. 12 D. 18
3. In a singly Linked List, what is stored in the 'next' part of the last node?
A. Address of first node B. Address of previous node
C. NULL D. Garbage value
4. Which data structure follows the LIFO principle?
A. Queue B. Linked List
C. Stack D. Tree
5. The pointer used to point to the current top element of a Stack implemented by an array is:
A. Front B. Rear
C. Top D. Index
6. In a Queue implemented using an array, data elements are deleted from which end?
A. Rear B. Front
C. Top D. Bottom
7. Which of the following is a non-linear data structure?

- | | |
|----------|----------------|
| A. Array | B. Linked List |
| C. Graph | D. Stack |
8. In an Adjacency Matrix representation of an undirected graph, the matrix is always:
- | | |
|--------------------|---------------------|
| A. Identity matrix | B. Symmetric matrix |
| C. Sparse matrix | D. Diagonal matrix |
9. Which data structure is essential for implementing recursion?
- | | |
|----------|----------|
| A. Queue | B. Stack |
| C. Graph | D. Array |
10. An M-way tree of order M can have at most how many children?
- | | |
|--------|-------|
| A. M-1 | B. M |
| C. M+1 | D. 2M |

Part - B (Do as Directed)

10 Marks

1. Define a Triplet (Domain, Functions, Axioms) in the context of Data Structures.
2. Which function is used to allocate dynamic memory for an array in C?
3. In a Circular Linked List, the last node points back to the first node. (True/False)
4. Which operation used to insert an element into a Queue?
5. A node that does not have any child is called a _____ node in a tree.
6. The 'push' operation is used in Stacks. (True/False)
7. A Binary Search Tree is always a complete binary tree. (True/False)
8. Which algorithm is used to find the shortest path in a graph? _____
9. 'lptr' and 'rptr' are used in the node structure of a Doubly Linked List. (True/False)
10. If the 'front' and 'rear' pointers of a Queue are both -1, the Queue is _____.

!~~~~~ Best of Luck ~~~~~!