

Dr. Babasaheb Ambedkar Open University
Term End Examination February – 2026

Course	: BCAR/DCAR	Date	: 12-Feb-26
Subject Code	: BCAR/DCAR-201	Time	: 03:00pm to 05:15pm
Subject Name	: Data Structure Using C	Duration	: 02.15 Hours
		Max. Marks	: 70

Section A

Answer the following (Attempt any three) (30)

1. What is Circular Queue? Write an algorithm for insertion of an element in Circular queue.
2. What are the applications of linked list?
3. Explain the algorithm to convert infix to postfix expression.
4. Write an algorithm to find shortest path using Kruskal's Algorithm.
5. Explain hashing technique.

Section B

Answer the following (Attempt any four) (20)

1. How to represent a single dimensional and multidimensional array in the memory?
2. Define sparse array.
3. What is a doubly linked list?
4. Write an algorithm for Depth First Search (DFS).
5. Explain Bubble Sort Algorithm with an example.
6. Explain Sequential and Index file organizations.

Section C

Part – A (Multiple Choice Questions) (10)

- 1 In which data structure are elements added and removed from the same end?
A Queue B Stack
C Linked List D Priority Queue
- 2 In a singly linked list, which pointer is used to link the last node to NULL?
A data pointer B next pointer
C prev pointer D first pointer
- 3 Which of the following is true about a Binary Search Tree (BST)?
A Left child is greater than the parent node. B Right child is greater than the parent node.
C Both left and right children are equal to the parent node. D Left child is always equal to the parent node.
- 4 In a circular queue, where is the rear pointer when the queue is empty?
A rear = front B rear = NULL
C rear = -1 D rear = 0

- 5 What is the term used for the number of edges incident on a vertex in a graph?
 A Degree B Path
 C Weight D Connectivity
- 6 Which algorithm is most suitable for finding the minimum spanning tree in a graph with many edges?
 A Dijkstra's Algorithm B Kruskal's Algorithm
 C Prim's Algorithm D Bellman-Ford Algorithm
- 7 Which sorting algorithm uses a divide-and-conquer strategy to sort elements?
 A Bubble Sort B Selection Sort
 C Insertion Sort D Quick Sort
- 8 Which of the following is a characteristic of sequential file organization?
 A Records are accessed directly B Records are organized in lexicographic order
 C A key index is maintained D Data can be updated in any order
- 9 Which of the following is used to store key-value pairs?
 A Queue B Hash Map
 C Stack D Linked List
- 10 What is the worst-case time complexity of Bubble Sort?
 A $O(n)$ B $O(n \log n)$
 C $O(n^2)$ D $O(\log n)$

Part – B (Do as Directed)

(10)

- 1 _____ is the process of collecting all unused nodes and returning them to available space.
- 2 _____ elements are dequeued based on priority rather than the order they were enqueued.
- 3 The first or the main node of the tree is called the _____ node.
- 4 _____ graph that contains at least one cycle (a path that starts and ends at the same vertex).
- 5 _____ refers to children of the same parents.
- 6 A queue follows the Last In, First Out (LIFO) principle. **(True/False)**
- 7 DFS uses a _____ (queue/stack) to explore as far down a path as possible before backtracking.
- 8 In an undirected graph, if there is an edge between vertex A and vertex B, there is automatically an edge from B to A. **(True/False)**
- 9 D-queue is also called as _____.
- 10 A graph in which a number is associated with each arc is called a _____ .
