

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

Course	: BSCIT	Date	: 23/07/2026
Subject Code	: BSCIT-203	Time	: 11:30am to 01:45pm
Subject Name	: Data Structure	Duration	: 02.15 Hours
		Max. Marks	: 70

Section A

Answer the following (Attempt any three) (30)

1. Discuss various types of Data Structures in detail.
2. Explain the operations performed on Arrays.
3. Explain the representation of Linked Lists.
4. Explain Binary Trees. Discuss the different tree traversal techniques and explain any one traversal algorithm with an example.
5. Explain various searching techniques. Compare Linear Search and Binary Search with suitable algorithms.

Section B

Answer the following (Attempt any four) (20)

1. Differentiate between Primitive Data Types and Abstract Data Types (ADT).
2. Explain sparse matrices and their advantages.
3. Write a short note on Circular Queue.
4. Explain the applications of Stack.
5. Differentiate between Tree and Graph.
6. Explain Bubble Sort with a suitable example.

Section C

Part – A (Multiple Choice Questions) (10)

Q.1 Which data structure allocates memory during program execution?

- A) Static Array B) Dynamic Data Structure
C) Fixed Array D) Enumeration

Q.2 Which array operation is primarily used to visit every element exactly once?

- A) Traversal B) Merging
C) Rotation D) Partitioning

Q.3 In a singly linked list, each node generally contains:

- A) Data only B) Address only
C) Data and a link to the next node D) Two data fields only

Q.4 Which stack operation inserts a new element?

- A) Delete B) Push
C) Pop D) Peek

Q.5 Which queue operation removes an element from the front?

- A) Insert B) Push
C) Dequeue D) Traverse

Q.6 Which tree traversal visits the Root node before its subtrees?

- A) Inorder B) Postorder
C) Preorder D) Level-order

Q.7 Which searching technique repeatedly divides the search interval into two equal parts?

- A) Sequential Search B) Binary Search
- C) Hash Search D) Indexed Search

Q.8 Which sorting algorithm repeatedly compares and exchanges adjacent elements?

- A) Merge Sort B) Quick Sort
- C) Bubble Sort D) Heap Sort

Q.9 Which data structure is commonly used to represent hierarchical relationships?

- A) Queue B) Stack
- C) Tree D) Array

Q.10 Which file organization stores records in ascending order of a key field?

- A) Heap File B) Sequential File
- C) Random File D) Temporary File

Part – B (State whether the following statements are true or false)

(10)

- 1 An Abstract Data Type (ADT) specifies the behavior of a data structure without defining its implementation.
- 2 Array elements occupy contiguous memory locations.
- 3 A linked list can grow or shrink during program execution.
- 4 A stack is widely used for handling function calls and recursion.
- 5 Circular queues help utilize available storage more efficiently than simple linear queues.
- 6 A graph may contain cycles connecting its vertices.
- 7 Binary trees are special cases of general tree structures.
- 8 Searching algorithms are selected based on data organization and application requirements.
- 9 Internal sorting is performed when all data fits into the main memory.
- 10 File structures provide organized storage and retrieval of data on secondary storage devices.
