

# Satyug Darshan Institute of Engineering & Technology, Faridabad

## Department of Computer Science & Engineering

Academic year 2025-26

|                                      |                                  |
|--------------------------------------|----------------------------------|
| <b>Programme:</b> BCA-DS/GEN         | <b>Year &amp; Semester :</b> 3rd |
| <b>Course Name:</b> Data Structures  | <b>Course Code:</b> BCG-201-V    |
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### Unit I

#### Short answer questions

| Q.N. | Question                                            | KL |
|------|-----------------------------------------------------|----|
| 1    | Define data structure.                              | K1 |
| 2    | Differentiate between data type and data structure. | K2 |
| 3    | What is Big-O notation?                             | K1 |
| 4    | List applications of data structures.               | K2 |
| 5    | What is linear search?                              | K1 |

#### Long answer questions

| Q.N. | Question                                                            | KL |
|------|---------------------------------------------------------------------|----|
| 1    | Explain categories of data structures with suitable examples.       | K3 |
| 2    | Discuss time-space trade-off with examples.                         | K3 |
| 3    | Explain string storage techniques and string operations.            | K3 |
| 4    | Describe pattern matching algorithms in strings.                    | K4 |
| 5    | Compare linear search and binary search algorithms with complexity. | K4 |

### Unit II

#### Short answer questions

| Q.N. | Question                             | KL |
|------|--------------------------------------|----|
| 1    | What is a linear array?              | K1 |
| 2    | Define sparse array.                 | K1 |
| 3    | What is a linked list?               | K1 |
| 4    | Differentiate array and linked list. | K2 |
| 5    | What is garbage collection?          | K1 |

#### Long answer questions

| Q.N. | Question                                                                    | KL |
|------|-----------------------------------------------------------------------------|----|
| 1    | Explain representation of linear arrays in memory with address calculation. | K3 |
| 2    | Describe insertion and deletion operations in arrays.                       | K3 |
| 3    | Explain different types of linked lists with diagrams.                      | K4 |
| 4    | Discuss searching and sorting algorithms used in arrays.                    | K4 |
| 5    | Explain applications of linked lists in real-world                          | K3 |

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## Unit III

### Short answer questions

| Q.N. | Question                  | KL |
|------|---------------------------|----|
| 1    | Define stack.             | K1 |
| 2    | What is recursion?        | K1 |
| 3    | Define queue.             | K1 |
| 4    | What is a priority queue? | K2 |
| 5    | What is a deque?          | K2 |

### Long answer questions

| Q.N. | Question                                                   | KL |
|------|------------------------------------------------------------|----|
| 1    | Explain stack operations using array representation.       | K3 |
| 2    | Describe applications of stack with examples.              | K4 |
| 3    | Explain queue operations using linked list representation. | K3 |
| 4    | Discuss different types of queues and their applications.  | K4 |
| 5    | Explain evaluation of arithmetic expressions using stack.  | K4 |

## Unit IV

### Short answer questions

| Q.N. | Question                      | KL |
|------|-------------------------------|----|
| 1    | Define tree data structure.   | K1 |
| 2    | What is binary tree?          | K1 |
| 3    | Define graph.                 | K1 |
| 4    | What is adjacency matrix?     | K2 |
| 5    | Define minimum spanning tree. | K2 |

### Long answer questions

| Q.N. | Question                                          | KL |
|------|---------------------------------------------------|----|
| 1    | Explain representation of binary trees in memory. | K3 |
| 2    | Describe binary tree traversal techniques.        | K4 |
| 3    | Explain graph representations with examples.      | K3 |
| 4    | Discuss Dijkstra's algorithm for shortest path.   | K4 |
| 5    | Compare Prim's and Kruskal's algorithms for MST.  | K4 |