

Dr. Babasaheb Ambedkar Open University, Ahmedabad

Term-End Examination : January-2026

Course Name : MCA

Subject Name : Data Structure and Algorithms

Subject Code : MCA/MCAOL-101

Date : 16-02-2026

Time : 11:30AM TO 01:45PM

Max Marks : 70

Section A

Q.-1. Answer the following (Attempt any three) (30)

- (1) What is the C language? Explain the different sections of the C language program.
- (2) Explain different categories of user-defined functions in detail.
- (3) Describe the working of the quick sort algorithm with an appropriate example, and write a C function/program to perform quick sort.
- (4) Write detailed note on the collision resolution technique.
- (5) What is a tree? Explain any ten important terms for the tree.

Section B

Q.-2. Write short notes on any four of the following topics. (20)

- (1) Explain unary, binary and ternary operator with suitable example
- (2) Write short note on union.
- (3) Explain pointer on the structure.
- (4) What is a data structure? Give a classification of data structures in brief.
- (5) What is a queue? Explain the representation of a queue.
- (6) Create a binary tree of the following alphabets.D, B, E, A, C, F

Section C

Q.-3. Choose the correct answer from the options given below. (10)

(1) Keywords in C are _____ words for the compiler.

- | | |
|-----------------|-------------|
| A) user-defined | B) reserved |
| C) temporary | D) variable |

(2) The if statement in C is used for _____.

- | | |
|------------|--------------|
| A) looping | B) branching |
| C) input | D) output |

(3) The break statement is used to _____ the loop.

- | | |
|--------------|----------|
| A) restart | B) skip |
| C) terminate | D) pause |

(4) The list of variables in a function definition is called _____.

- | | |
|----------------|---------------|
| A) arguments | B) parameters |
| C) identifiers | D) constants |

(5) Which of the following is a primitive data structure?

- | | |
|------------|----------------|
| A) Array | B) Stack |
| C) Integer | D) Linked List |

(6) Stack and Queue are examples of _____ data structures.

- | | |
|---------------|-----------------|
| A) non-linear | B) primitive |
| C) linear | D) hierarchical |

(7) The first node of a linked list is called _____.

- | | |
|----------|----------|
| A) start | B) head |
| C) top | D) front |

(8) Which searching method uses divide and conquer?

- | | |
|-------------|---------------|
| A) Linear | B) Binary |
| C) Sentinel | D) Sequential |

(9) A graph with edges having direction is called ____.

- A) undirected
- B) weighted
- C) directed
- D) cyclic

(10) Adjacency matrix representation uses ____ matrix.

- A) sparse
- B) 1D
- C) 2D
- D) triangular

Section D

Q.-4. State whether the following statements are true or false.

(10)

- (1) High-level languages are faster than machine language in execution.
- (2) The main() function is the starting point of execution in a C program.
- (3) The escape sequence “\t” is used to generate a new line.
- (4) The continue statement is used to terminate the loop immediately.
- (5) Infinite loops always occur due to syntax errors in the program.
- (6) Structure variables are also known as records.
- (7) A union can store values in all its members at the same time.
- (8) Memory for linked list nodes is allocated statically at compile time.
- (9) Selection sort places the largest element at the beginning in each pass.
- (10) Interpolation search works efficiently when data is uniformly distributed.
