



Seat No. _____

HN-003-3032001

B. C. A. (Sem. II) (CBCS) (W.E.F. 2022)
Examination

April - 2023

Data Structure Using C Language : CS-07

Faculty Code : 003

Subject Code : 3032001

Time : $2\frac{1}{2}$ / Total Marks : **70**

1 (a) Attempt the following : 4

- (1) A _____ function is used to de allocate memory.
- (2) The _____ notation is used when the function g(n) defines a lower bound for the function f(n).
- (3) Backtracking algorithm is based on _____.
- (4) In O notation, the expression O called _____ symbol.

(b) Answer in brief : (any 1 out of two) 2

- (1) Define Big-Oh notation.
- (2) Explain dangling pointer problem with example.

(c) Answer in detail : (any 1 out of 2) 3

- (1) Explain classes of algorithm.
- (2) Explain enumerated constant with example.

(d) Write a note on : (any 1 out of 2) 5

- (1) Explain dynamic memory allocation functions with example.
- (2) What is algorithm analysis ? Explain time and space complexity of algorithm.

2 (a) Attempt the following : 4

- (1) _____ sorting method is also known as bin sort.
- (2) In _____ sorting techniques it compare each element of the list with element next to it.
- (3) List the sorting techniques based on divide and conquer approach.
- (4) Quick sort is using _____ for implementation.

(b) Answer in brief : (any 1 out of 2) 2
 (1) Write an algorithm for bubble sort.
 (2) Explain shell sort techniques.

(c) Answer in detail : (any 1 out of 2) 3
 (1) Explain bucket sort technique.
 (2) Write an algorithm for selection sort.

(d) Write a note on : (any 1 out of 2) 5
 (1) Write a program for Insertion sort.
 (2) What do you mean by searching ? Explain binary search with example.

3 (a) Attempt the following : 4
 (1) LIFO stands for _____.
 (2) In queue elements are inserted at _____ end and deleted at _____ end.
 (3) When new data are to be inserted into a data structure, but there is no available space such situation is known as _____.
 (4) Convert infix to postfix : $a^b / (c^d) + e$.

(b) Answer in brief : (any 1 out of 2) 2
 (1) Explain recursion with stack.
 (2) Define priority queue.

(c) Answer in detail : (any 1 out of 2) 3
 (1) Explain types of data structure.
 (2) Explain types of Deque.

(d) Write a note on : (any 1 out of 2) 5
 (1) Write a menu driven program to perform insert, delete and display operations on circular queue.
 (2) Write an algorithm step for push, pop and display operations of stack.

4 (a) Attempt the following : 4
 (1) Linked list is known as _____ data type.
 (2) Each entry in a linked list is called a _____
 (3) _____ linked list can be performed traversal in both directions.
 (4) How many fields are in node of doubly linked list ? Name them.

<p>(b) Answer in brief : (any 1 out of 2) 2</p> <p>(1) Define linked list.</p> <p>(2) Write advantages of Liked list over array.</p> <p>(c) Answer in detail : (any 1 out of 2) 3</p> <p>(1) Write a program to perform reversing a linked list.</p> <p>(2) What is header linked ? Explain types of header linked list.</p> <p>(d) Write a note on : (any 1 out of 2) 5</p> <p>(1) Write an algorithm for following of doubly linked list: create, insert (at any place), delete (at any place), display.</p> <p>(2) Write a menu driven program to create singly linked list with following operation: Create(), Insertfirst(), Deletefirst(), Display().</p>
<p>5 (a) Attempt the following : 4</p> <p>(1) The root node has _____ parent node.</p> <p>(2) _____ is the greedy algorithm.</p> <p>(3) If an edge in graph has identical end points, it is called a _____.</p> <p>(4) MST stands for _____.</p> <p>(b) Answer in brief : (any 1 out of 2) 2</p> <p>(1) Explain the basic terminologies of binary tree.</p> <p>(2) Define BST.</p> <p>(c) Answer in detail : (any 1 out of 2) 3</p> <p>(1) Explain adjacency list and adjacency matrix representation of graph.</p> <p>(2) Explain classification of tree.</p> <p>(d) Write a note on : (any 1 out of 2) 5</p> <p>(1) Explain Graph traversal techniques in detail.</p> <p>(2) What do you mean by traversal of tree? Explain tree traversal methods in detail.</p>
