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. 3

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

(1) Explain bucket sort technique.

(2) Write an algorithm for selection sort. 5

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

(1) Write a program for Insertion sort.

(2) What do you mean by searching ? Explain binary search with example. 4

3 (a) Attempt the following :

(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. 2

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

(1) Explain recursion with stack.

(2) Define priority queue. 3

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

(1) Explain types of data structure.

(2) Explain types of Deque. 5

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

(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.

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

(1) Define linked list.

(2) Write advantages of Liked list over array.

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

(1) Write a program to perform reversing a linked list.

(2) What is header linked ? Explain types of header linked list.

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

(1) Write an algorithm for following of doubly linked list: create, insert (at any place), delete (at any place), display.

(2) Write a menu driven program to create singly linked list with following operation: Create(), Insertfirst(), Deletefirst(), Display().

5 (a) Attempt the following : 4

(1) The root node has _____ parent node.

(2) _____ is the greedy algorithm.

(3) If an edge in graph has identical end points, it is called a _____.

(4) MST stands for _____.

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

(1) Explain the basic terminologies of binary tree.

(2) Define BST.

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

(1) Explain adjacency list and adjacency matrix representation of graph.

(2) Explain classification of tree.

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

(1) Explain Graph traversal techniques in detail.

(2) What do you mean by traversal of tree? Explain tree traversal methods in detail.
