Seat No. _____

HN-003-2032001

B. C. A. (Sem. II) (CBCS) (W.E.F. 2019) Examination

April - 2023

Data Structure Using C Language : CS-07

Faculty Code : 003
Subject Code : 2032001

Time : / Total Marks : **70**

1 (a) Attempt the following : **4**

(1) A _____ function is used to be allocate memory.

(2) The _____ notation is used when the function g(n) defines a lower bound for the function f(n).

(3) _____ algorithm is the greedy algorithm.

(4) Dijkstra's algorithm is using for _____.

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

(1) Define Big-Oh notation.

(2) Explain adjacency matrix representation of graph.

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

(1) What is algorithm analysis ?

(2) Dangling pointer problem with example.

(d) Writ a note on : (any 1 out of two) **5**

(1) Explain dynamic memory allocation functions with example.

(2) Explain Graph traversal techniques in detail.

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) Sequential search is also known as _____.

(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) FIFO stands for _____

(2) In queue elements are inserted from ____ end.

(3) _____ form of access method is used to add and remove elements from a stack.

(4) If tos = -1 then, the stack is _____.

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

(1) What is RPN ? Explain with example.

(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 simple 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) In a single linked list last node contains _____ in its next link.

(3) _____ linked list can be performed traversal in both directions.

(4) In _____ type of linked list there are no NULL links.

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

(1) Define linked list.

(2) Write advantages of Linked 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 pace), 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) A node which has no sub tree is known as _____.

(3) Tree is _____ type of data structure.

(4) Which is the suitable efficient data structure to construct a tree.

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

(1) Explain the basic terminologies of binary tree.

(2) Define B-tree

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

(1) Explain AVL tree.

(2) Write a note on classification of tree.

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

(1) Write a program to insert node in BST and perform searching.

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