Seat No. : _____

MH-207

May-2025

B.C.A., Sem-II (NEP 2020)

DSC-C-BCA-121T : Data Structures Using C

Time : 2:00 Hours] **[Max. Marks : 50**

1. (A) Explain the classification of data structures in detail. **5**
   (B) Explain how to create a table of numbers called Meru Prastaar. **5**

OR

1. (A) Sort the following data using selection sort technique : **5**
   62, 35, 15, 24, 10, 78, 94, 7, 56
   (B) Give differences between linear search and binary search. **5**

2. (A) Write an algorithm to delete particular node in doubly linked list. **5**
   (B) Explain the concept of node, structure and storage representation of singly linked list. **5**

OR

2. (A) Write an algorithm to insert node after any node in singly linked list. **5**
   (B) Write a short note on doubly linked list. **5**

3. (A) Write an algorithm for push and pop operations of a stack using array. **5**
   (B) Explain the structure and operations (enqueue and dequeue) of the circular queue with an example. **5**

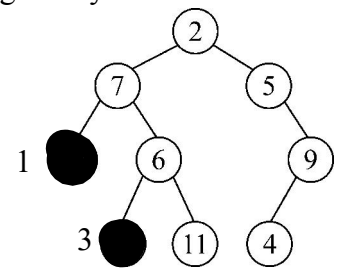
OR

3. (A) Convert the following infix expression to the postfix expression : **5**
   (a + b) * ((c / d) + e)
   (B) Write an algorithm to insert and delete an item in/from a simple queue. **5**

4. (A) Write a short note on threaded binary tree. **5**
   (B) Explain BFS traversal with an example. **5**

OR

4. (A) Write down the steps for how to find the minimum spanning tree using Kruskal's algorithm. Explain with an example. **5**
   (B) Define Binary Search Tree (BST). Write the in-order, pre-order, and post-order traversal of following binary tree : **5**



5. Attempt any **ten** out of **twelve** : **10**

(1) Letters can be either long (Guru) or short (Laghu) syllables in Sanskrit prosody. [True / False]

(2) Queue follows _____. [LIFO / FIFO]

(3) The _____ works on the principle of inserting an element at a particular position.

(a) bubble sort (b) selection sort

(c) insertion sort (d) None of above

(4) Identify the data structure which allows insertion at both ends of the list but deletion at only one end.

(a) Input restricted dequeue (b) Output restricted dequeue

(c) Priority queues (d) None of above

(5) In singly linked list, _____ part stores the value of the node and _____ part stores address of the next node.

(a) data, link (b) link, data

(c) null, link (d) data, null

(6) The queue data structure can be used to traverse the DFS algorithm. [True / False]

(7) Arrays are a type of _____ data structure. [linear / non-linear]

(8) Each leaf node represents an operand, and each internal node represents operators in _____.

(a) AVL tree (b) expression tree

(c) binary search tree (d) B-tree

(9) Linked lists contain a pointer variable, Start/Header, that stores the address of the _____ node in the list. [first / last]

(10) The _____ is an example of prefix expression.

(a) ab/c + (b) a+b/c

(c) +/abc (d) None of above

(11) If the balance factor of a node is 1, then it is called as a _____ tree.

(a) right-heavy (b) balanced

(c) left-heavy (d) unbalanced

(12) A linked list where the last node points to the first node of the list, called _____ linked list.

(a) singly (b) circular

(c) doubly (d) None of above

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