Seat No. : 304

# AQ-127

April-2024

## BCA., Sem.-II (NEP-2020)

## DSC-C-BCA-121 T : Data Structures using C

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

1. Answer the following :
   (i) Explain the procedure to create binary numbers by Aacharya Pingala. 5
   (ii) What is data structure ? Explain linear and non-linear data structure. 5

   **OR**

   (i) Write the steps to create a table of numbers called Meru Prastar. 5
   (ii) What is searching ? Explain linear search in detail. 5

2. Answer the following :
   (i) Write an algorithm to insert and delete first element in singly linked list. 5
   (ii) List and explain types of linked list with example. 5

   **OR**

   (i) Write an algorithm to insert and delete last element in doubly linked list. 5
   (ii) Write an algorithm to insert element before the given number in singly linked list. 5

3. Answer the following :
   (i) What is stack ? Explain PUSH, POP and PEEP operations with algorithm. 5
   (ii) Write an algorithm to insert element in simple queue. 5

   **OR**

   (i) What is Queue ? Explain types of queue with example. 5
   (ii) Convert the given infix expression into postfix using stack : 5

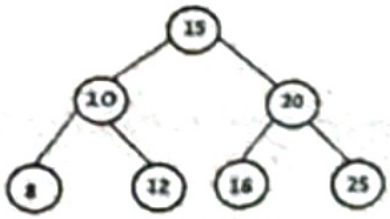
   (A + B) + (C / D) % (E – F)

4. Answer the following :
   (i) Write a short note on AVL Tree. 5
   (ii) List graph traversal methods. Explain any one with example. 5

   **OR**

(i) What is graph ? List and explain graph representation methods. **5**

(ii) Write sequence for in-order, pre-order, post-order for the given binary tree : **5**




5. Answer the following : (any **ten**) **10**

(1) Which among the following is LIFO data structure ?

(a) Stack (b) Queue

(c) Linked list (d) Graph

(2) Linked list is used to implement data structures like _____.

(a) Stack (b) Queue

(c) Tree (d) All of these

(3) In a queue, insertion is done at _____.

(a) Front (b) Rear

(c) Top (d) Back

(4) The node which has no child nodes is called _____.

(a) Root node (b) Parent node

(c) Leaf node (d) All of these

(5) All the leaf nodes in the _____ are at the same level.

(a) Threaded Binary Tree (b) Binary Search Tree

(c) B-Tree (d) AVL Tree

(6) The term optimal means _____.

(a) Shortest (b) Cheapest

(c) Fastest (d) All of these

(7) In which sorting, consecutive adjacent pairs of elements in the array are compared with each other ?

(a) Bubble sort
(b) Selection sort
(c) Insertion sort
(d) Merge sort

(8) Who developed binary number system ?

(a) Aacharya Meru
(b) Aacharya Pingala
(c) Aacharya Bhaskar
(d) None of these

(9) BST stands for _____.

(a) Binary Search Tree
(b) Binary Sort Tree
(c) Binary Sibling Tree
(d) None of these

(10) In binary number system, the Laghu Swar (L) is replaced by _____ while the Guru Swar (G) is replaced by _____.

(a) 0, 1
(b) 1, 0
(c) 1, 1
(d) 0, 0

(11) _____ is an example of greedy algorithm.

(a) Prim's
(b) Dijkstra's
(c) Kruskal's
(d) All of these

(12) A graph in which each edge has some label is called _____.

(a) Simple graph
(b) Weighted graph
(c) Null graph
(d) Directed graph