2212N1061

Candidate's Seat No:____

BCA Sem.-3 Examination
CC 202
Data Structures

Time : 2.30 Hours] **December-2025** **[Max.Marks : 70**

QUESTION – 1 Write the following.

(i) Write the differences between linear search and binary search. 7

(ii) Define linked list. Write an algorithm to insert the node after the given location (position) in a doubly linked list. 7

OR

(i) Write an algorithm for selection sort and sort the following data using selection sort. 7
24, 57, 34, 46, 12, 81, 9, 76, 65

(ii) Discuss each classification of data structures in detail. 7

QUESTION – 2 Write the following.

(i) Write an algorithm for push, pop and peep operations of a Stack using linked list. 7

(ii) Define Queue. Explain the structure and operations (insertion and deletion) of the Circular Queue with an example. 7

OR

(i) Convert the following infix expression to the postfix expression using Stack. 7
A*(B+C*(D+E/F))-H

(ii) Write an algorithm to insert and delete an item in/from a Queue using linked list. 7

QUESTION – 3 Write the following.

(i) Define binary tree. Create a binary tree for the following: 7
Inorder: 1, 2, 3, 4, 5, 6, 7, 8, 9
Preorder: 1, 3, 5, 4, 2, 7, 9, 8, 6

(ii) Write a short note on the Threaded Binary Tree. 7

OR

(i) Explain the following operations on Binary Search Tree (BST) with an example. 7
a) Creation b) Insertion c) Deletion

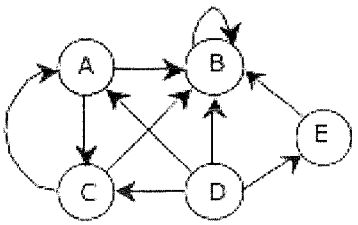
(ii) Create an expression tree for the following expression: ABC*+DE*F/+ 7

QUESTION – 4 Write the following

(i) Define Spanning tree. Write down the steps on how to find the minimum spanning tree using Prim's algorithm. Explain this with an example. 7

P.T.O

(ii) Consider the following graph and write the answer for the following: 7



a) Write an adjacency Matrix.

b) Write an adjacency List.

c) Find degree of vertex A.

d) Identify the source vertex.

OR

(i) Give comparisons between BFS and DFS with an example. 7

(ii) Write a short note on Dijkstra's algorithm. 7

QUESTION – 5 **Attempt any seven out of twelve.** **14**

1. Which data structure defined as a collection of similar data elements?

   a) Arrays c) Linked list

   b) Tree d) Graph

2. Sparse matrix is a matrix most of whose elements are nonzero. [True/False]

3. Quick sort uses _____.

   a) backtracking c) heuristic approach

   b) divide and conquer d) greedy approach

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

   a) Input restricted dequeue c) Priority queues

   b) Output restricted dequeue d) None

5. The prefix expression of a*(b-(c*d))+e is _____.

   a) *+a-b*cde c) +*a-b*cde

   b) +*a*b-cde d) *+a-bc*de

6. Queue follows_____. [LIFO/FIFO]

7. Give one difference between linked list and array.

8. The in-degree of root node is always _____.

   a) 0 c) 1

   b) 2 d) None

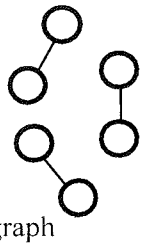
9. Define isolated vertex.

10. The size of graph is the total number of edges in it. [True/ False]

11. The balance factor is the difference between height of _____sub tree and height of _____ sub tree.

a) right, left
b) left, right
c) left, left
d) right, right

12. Identify the following graph.



a) 0 regular graph
b) 2 regular graph
c) 1 regular graph
d) 3 regular graph