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Question Paper Code: 94429

B.E./B.Tech. DEGREE EXAMINATION, NOV 2025

Fourth Semester

Electronics and Communication Engineering

19UIT429- INTRODUCTION TO DATA STRUCTURES AND ALGORITHMS

(Regulations 2019)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (10x 2 = 20 Marks)

1. Develop an algorithm and construct the coding for deleting a node in the singly linked list where the position to be deleted is given. CO2- App
2. Write the routine for insertion operation of singly linked list. CO2- App
3. What is the difference between Linear array and Linked List? CO1- U
4. What type of memory allocation is referred for Linked lists? Why? CO1- U
5. Define stack and list the application. CO1- U
6. What do you understand by stack overflow and underflow? CO1- U
7. Differentiate between a stack and queue. CO1- U
8. How does a stack implemented using linked lists differ from a stack implemented using an array? CO1- U
9. Draw the binary expression tree that represents the following postfix expression: $A B + C * D -$ CO2- App
10. How many nodes will a complete binary tree with 27 nodes have in the last level? What will be the height of the tree? CO2- App

PART – B (5 x 16= 80Marks)

11. (a) Explain the different approaches to design an algorithm with neat diagram CO1-U (16)
- Or
- (b) Explain and diagrammatic illustrations how insertion and deletions can be performed on singly linked list. CO1-U (16)

12. (a) Develop an algorithm and diagrammatic illustrations the various operations that can be performed on a stack ADT using array. CO2-App (16)

Or

- (b) Develop an algorithm and diagrammatic illustrations the various operations that can be performed on a stack ADT using linked list. CO2-App (16)

13. (a) Write a C program to perform a push, pop and display operations on stack ADT using array. CO2-App (16)

Or

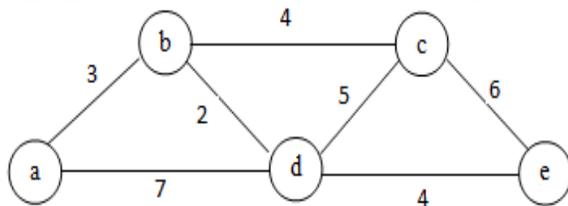
- (b) Write a C program to perform a push, pop and display on stack ADT using linked list. CO2-App (16)

14. (a) Explain Binary Tree and Traversing a binary Tree with example. CO1- U (16)

Or

- (b) Explain Binary Search Tree with example. CO1- U (16)

15. (a) Find a shortest path between any two vertices of a weighted graph or digraph and Estimate the efficiency of Dijkstra's Algorithm. CO1- U (16)



Or

- (b) Apply Prim's algorithm to find the minimum spanning tree for the following graph and write an algorithm of Prim's Algorithm. CO1- U (16)

