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Question Paper Code: 94829

B.E./B.Tech. DEGREE EXAMINATION, NOV 2023

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. Define data structures. CO1- U
2. What is an Array in Data Structure? Why do we need arrays? CO1- U
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 classification of data structures. CO1-U (16)
Or
(b) Explain the linked list and its types with example. CO1-U (16)

12. (a) Explain the array representation of stack with example. CO1-U (16)
 Or
 (b) Explain the linked representation of stack with example. CO1-U (16)
13. (a) Develop an algorithm and diagrammatic illustrations the various operations that can be performed on a queue using array. CO2-App (16)
 Or
 (b) Develop an algorithm and diagrammatic illustrations the various operations that can be performed on a queue 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) Explain the Adjacency Matrix Representation and Adjacency List Representation in graph with example. CO1- U (16)
 Or
 (b) Explain the Prim's algorithm for computing the minimal spanning tree weighted undirected graph with example. CO1- U (16)