**Reg. No. :** | | | | | | | | | | |

B.E./B.Tech. DEGREE EXAMINATION, MAY 2022

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           CO1- U
   implemented using an array?

9. Draw the binary expression tree that represents the following postfix          CO2- App
   expression: A B + C * D –

10. How many nodes will a complete binary tree with 27 nodes have in the last   CO2- App
    level? What will be the height of the tree?

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)

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