Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code: U4829

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

Fourth Semester

Electronics and Communication Engineering

21UIT429 - INTRODUCTION TO DATA STRUCTURES AND ALGORITHMS

(Regulations 2021)

Duration: Three hours   Maximum: 100 Marks

Answer All Questions

PART A - (10 x 2 = 20 Marks)

1. Define data structures   CO1-U

2. What type of memory allocation is referred for Linked lists? And Why?   CO1-U

3. Illustrate, how you refer all of the elements in a one-dimension array?   CO1-U

4. Write the routine for insertion operation of singly linked list.   CO2-App

5. What do you understand by stack overflow and underflow?   CO1-U

6. List the application of queues.   CO1-U

7. Define circular queues. How is it better than a linear queue?   CO1-U

8. Write a program to convert the expression "a+b" into "ab+".   CO2-App

9. Define Graph with example.   CO1-U

10. How is an AVL tree better than a binary search tree? Justify your answer.   CO3-Ana

PART – B (5 x 16= 80 Marks)

11. (a) Explain the classification of data structures.   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) Explain the linked representation of stack with example. CO1-U (16)

Or

(b) Explain the array 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 linked list.. CO2-App (16)

Or

(b) Write a C program to perform insert, delete and display operations on queues ADT using array. CO2-App (16)

14. (a) Construct a Binary Search tree from the following set of elements 25, 14, 2, 45, 78, 1, 3, 4, 5, 20, 11, 56, 90, 85, 79, 65 and traverse the tree built in In-order, Post order and Preorder. CO2-App (16)

Or

(b) Illustrate with the all rotations and Construct an AVL tree by inserting the following elements in the given order 63, 9, 19, 27, 18, 108, 99, 81 CO2-App (16)

15. (a) Explain the Topological Sorting 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)

U4829