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

Question Paper Code:U4829

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

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.	Can we change the size of an array at run time? Justify your answer.	CO1-U
3.	Why quicksort is preferred for arrays and merge sort for linked lists? Justify your answer.	CO3-AN
4.	Give the linked representation of the following polynomial: 7x3 – 8x2 + 3x + 4	CO2-App
5.	How to check whether stack is empty or not?	CO1-U
6	Define queue with example.	CO1-U
7	Write a program to calculate the number of items in queues.	CO2-App
8	What is the postfix form of this expression? (A+B)*(C/D).	CO2-App
9	Define Graph with example.	CO1-U
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= 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) Explain the linked representation of queue with example CO1-U (16)

Or

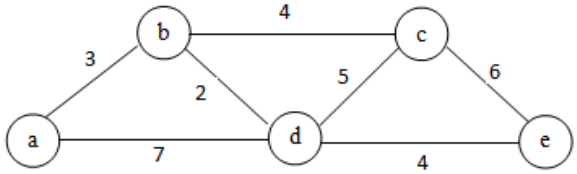
(b) Explain the array representation of queue with example. CO1-U (16)

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) Find a shortest path between any two vertices of a weighted graph or digraph and Estimate the efficiency of Dijkstra's Algorithm. CO2-App (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. CO2-App (16)