Reg. No.															

Question Paper Code	12774

M.E. / M.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

First Semester

Big Data Analytics

20PBDPC101 – ADVANCED DATA STRUCTURES AND ALGORITHMS

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

	Marks	K – Level	CO
1. What is TSTO? Write its types.	2	K1	CO1
2. Summarize the importance of recurrence equations in data structure.	2	K2	CO1
3. Define Deaps in data structure.	2	K1	CO2
4. Differentiate Min and Max heap.	2	K2	CO2
5. Define Splay trees.	2	K1	CO3
6. Analyze the term rotation in AVL tree.	2	K4	CO3
7. What are k-d trees?	2	K2	CO4
8. Define range trees.	2	K2	CO4
9. Define List Ranking.	2	K1	CO5
10. Define Array Max.	2	K1	CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11. a) i)	Explain the various criteria used for analyzing algorithms.	7	K3	CO1
ii)	List the properties of various asymptotic notations.	6	K3	CO1
	OR			
b) i)	Explain the necessary steps for analyzing the efficiency of recursive algorithms.	6	K3	CO1
ii)	Design a recursive decrease by one algorithm for sorting n real numbers in an array with an example and determine the number of key comparisons and time efficiency of an algorithm.	7	K4	CO1
12. a)	Explain Fibonacci Heap by constructing its structure.	13	K3	CO2
	OR			
b)	Illustrate Leftist Heaps in detail.	13	K3	CO2
13. a) i)	What is Binary Search tree? Write an algorithm to add a node into a binary search tree.	6	K3	CO3

ii) Explain the various cases for deleting a node from Binary search tree. 7 K3 CO3

OR

b) Explain about tries in data structure. 13 K2 CO3

14. a) Summarize the I-dimensional range searching algorithms by using k-d trees and range trees. 13 K3 CO4

OR

b) How the data structures are required in Voronoi diagrams? Explain. 13 K3 CO4

15. a) Describe about Flynn's classification. 13 K2 CO5

OR

b) Explain how data distribution is performed on EREW. 13 K2 CO5

PART - C (1× 15 = 15 Marks)

16. a) Create a red black tree by inserting the following sequence of numbers: 9, 12, 15, 4, 2, 28, 16, 29, 8, 32, 45. 15 K3 CO3

OR

b) i) Construct a splay tree for the dataset 6, 29, 15, 16, 10, 2, 45, 38, 9 and access 15. 8 K6 CO3

ii) Discuss about AVL tree with example. 7 K3 CO3