M.E. / M.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2023
First Semester
M.E.- Computer Science and Engineering
(Common to M.E. - Computer Science and Engineering (with Specialization in Networks))
20PCSPC101 - 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.	List the important problems that are solved by algorithms.	2,K1,CO1
2.	When are the recursion trees useful? Give an example.	2,K1,CO1
3.	What is the procedure to delete a key from B-Tree?	2,K1,CO2
4.	How binary search tree differ from binary tree?	2,K1,CO2
5.	What is a graph and its types?	2,K1,CO3
6.	Distinguish DFS and BFS.	2,K2,CO3
7.	What is Floyd Warshall algorithm?	2,K1,CO4
8.	What is All pair Shortest path Algorithm?	2,K1,CO4
9.	How dynamic programming is used to solve Knapsack problem?	2,K1,CO5
10.	State the general principle of greedy algorithm.	2,K1,CO5

PART - B (5 × 13 = 65 Marks)
Answer ALL Questions

11.	a)	Explain in detail the Asymptotic Notations along with the various functions and analysis.	13,K2,CO1
		OR	
	b)	Explain Substitution method with suitable examples.	13,K2,CO1

12.	a)	Explain in detail about Red Black tree with example.	13,K2,CO2
		OR	
	b)	Explain in detail about the various operations associated with B Trees.	13,K2,CO2

13.	a)	Differentiate depth-first search and breadth-first search traversal of a graph with suitable examples.	13,K2,CO3

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create   **12329**

<div align="center">**OR**</div>

b) What is topological sort? Write an algorithm to perform topological sort. *13,K2,CO3*

14. a) Explain the working of Kruskals Algorithm. *13,K2,CO4*

<div align="center">**OR**</div>

b) Explain the Dijkstra's Shortest path Algorithm and its efficiency. *13,K2,CO4*

15. a) Explain in detail about Greedy Algorithms. *13,K2,CO5*

<div align="center">**OR**</div>

b) Discuss in detail about in Optimal Binary Search Tree. *13,K2,CO5*

<div align="center">**PART - C (1 × 15 = 15 Marks)**</div>

16. a) Write the non-deterministic sorting algorithm and also analyze its complexity. *15,K3,CO6*

<div align="center">**OR**</div>

b) How P and NP problems related? Discuss in detail. *15,K2,CO6*