Reg. No.															

Question Paper Code	12734

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

First Semester

M.E. - Computer Science and Engineering

(Common to Compute 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.	Define an algorithm.	2	K2	CO1
2.	Give an example of recursion.	2	K1	CO1
3.	Differentiate binary tree and binary search tree.	2	K2	CO2
4.	List any four basic operations on trees.	2	K1	CO2
5.	When will you say that a graph is strongly connected?	2	K2	CO3
6.	Define the single source shortest path problem.	2	K1	CO3
7.	Mention the use of dynamic programming.	2	K1	CO4
8.	State the greedy strategy.	2	K1	CO4
9.	Define polynomial time.	2	K1	CO5
10.	Differentiate NP hard and NP complete problems.	2	K2	CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

			Marks	K – Level	CO
11.	a)	Explain the steps in analyzing an algorithm using insertion sort.	13	K2	CO1
		OR			
	b)	Explain the three asymptotic notations with its definition and representation.	13	K2	CO1
12.	a)	Illustrate the insertion and deletion operations in a binary search tree with an example.	13	K2	CO2
		OR			
	b)	Explain in detail about the various operations associated with B Trees.	13	K2	CO2
13.	a)	Compare breadth first and depth first search algorithms with an example.	13	K4	CO3
		OR			

	b)	Compare the steps in Kruskals and Prims algorithm in constructing a minimum spanning tree.	*13*	*K4*	*CO3*
14.	a)	Explain the matrix chain multiplication process with an example.	*13*	*K2*	*CO4*
		OR			
	b)	Explain the Huffman codes with examples.	*13*	*K2*	*CO4*
15.	a)	Illustrate the process of performing polynomial time verification.	*13*	*K2*	*CO5*
		OR			
	b)	Explain in detail about Dynamic Programming.	*13*	*K2*	*CO5*

PART - C (1 × 15 = 15 Marks)

16.	a)	Write the non-deterministic sorting algorithm and also analyze its complexity.	*15*	*K2*	*CO6*
		OR			
	b)	Illustrate the proofs for NP-Completeness.	*15*	*K2*	*CO6*