EVEN SEMESTER EXAMINATION, 2022 – 23
1st yr. MTech- Computer Science & Engg
Advance Algorithms

Duration: 3:00 hrs   **Max Marks: 100**

Note: - Attempt all questions. All Questions carry equal marks. In case of any ambiguity or missing data, the same may be assumed and state the assumption made in the answer.

Q 1.	Answer any four parts of the following.	5x4=20
	a) Explain all the operations of double linked lists?	
	b) Discuss about maxflow-mincut theorem with suitable example.	
	c) Explain the process of designing an algorithm. Give characteristics of an algorithm	
	d) What are asymptotic notations? Explain with diagram.	
	e) Write short notes on spanning trees.	
	f) Give the general procedure of divide and conquer method.	
Q 2.	Answer any four parts of the following.	5x4=20
	a) Write an algorithm for Binary search and discuss its complexity.	
	b) Simulate Quick sort algorithm for the following example 25,36,12, 4,5,16,58,54, 24,16 ,9,65,78.	
	c) Explain the operations on AVL Trees in detail?	
	d) Define height-biased min leftist trees. Give an algorithm to meld two such trees that takes O (log n) time.	
	e) Discuss dynamic rod-cutting top down and bottom-up approaches.	
	f) Explain Strassen's matrix multiplication and its time complexity.	
Q 3.	Answer any two parts of the following.	10x2= 20
	a) Explain the procedure to sort the nodes in a single linked list and also explain breadth first travel with an example?	
	b) Describe Travelling Salesperson Problem (TSP) using Dynamic Programming.	
	c) Discuss in detail about the class P, NP, NP-hard and NP-complete problems. Give examples for each class.	
Q 4.	Answer any two parts of the following.	10x2= 20
	a) Define B-Tree. Generate a B-Tree of order 3 (2-3 tree) for the following key values 25,10,12,15,39,64,53.	
	b) What are randomized algorithms? Explain with example.	
	c) Explain and analyze ford-fulkerson algorithm for maximum flow.	
Q 5.	Answer any two parts of the following.	10x2= 20
	a) Explain Chinese remainder theorem and also discuss its interpolation problem.	
	b) Define height-biased min leftist trees. Give an algorithm to meld two such trees that takes O (log n) time.	
	c) Explain General method of Greedy method. Find the greedy solution for following job sequencing with deadlines problem n = 7, (p1,p2,p3,p4,p5,p6,p7) = (3,5,20,18,1,6,30), (d1,d2,d3,d4,…,d7) = (1,3,4,3,2,1,2)	

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