BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION MO/SP20)**

CLASS: BTECH **SEMESTER: VII**
BRANCH: EEE/ECE/MECH **SESSION : MO/2022**

SUBJECT: CS206 DESIGN AND ANALYSIS OF ALGORITHMS

TIME: 03 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

S.No.	Questions	Marks	CO
Q.1(a)	Write the Master's Theorem.	[2]	1
Q.1(b)	Describe different asymptotic notations.	[3]	1
Q.1(c)	Solve the recurrence: $T(n)=4T(\frac{n}{2})+n$	[5]	5
Q.2(a)	Briefly explain the AVL tree.	[2]	2
Q.2(b)	Find the time complexity of binary search algorithm.	[3]	3
Q.2(c)	Write the merge sort algorithm and sort the array A={3,1,4,1,5,9,2,6,5,3,5,8,9} using merge sort.	[5]	3
Q.3(a)	Briefly explain the concept behind Dynamic Programming.	[2]	1
Q.3(b)	Discuss the advantages of Dynamic Programming over the divide and conquer approach.	[3]	2
Q.3(c)	Discuss any one algorithm to find the all pair shortest path for a given graph and also find the time complexity of this algorithm.	[5]	5
Q.4(a)	Discuss the greedy approach.	[2]	1
Q.4(b)	Write the Kruskal's algorithm.	[3]	3
Q.4(c)	Describe the Prim's algorithm with example and also find the time complexity of Prim's algorithm.	[5]	5
Q.5(a)	Describe the searching and sorting.	[2]	3
Q.5(b)	Explain briefly the class P, NP and NP Complete problem with example.	[3]	1
Q.5(c)	Discuss the Approximation Algorithm and explain how to solve the Travelling Sales Person problem using this algorithm.	[5]	4

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