BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: **B.Tech** **SEMESTER : VII**
BRANCH: **ECE&ME** **SESSION : MO/2023**

SUBJECT: CS206 DESIGN AND ANALYSIS OF ALGORITHM

TIME: **3 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*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Explain various asymptotic notations with suitable examples.	[5]	2	1
Q.1(b)	Solve the following recurrence relation: $T(n)=4T(\frac{n}{2})+n^3$	[5]	3	3
Q.2(a)	Discuss the 'Divide and conquer' paradigm of problem solving technique.	[5]	2	2
Q.2(b)	Explain the concept of merge sort along with its time complexity.	[5]	3	4
Q.3(a)	What is dynamic programming? Discuss the elements of dynamic programming.	[5]	3	2
Q.3(b)	How does the dynamic programming differ from greedy algorithm?	[5]	3	4
Q.4(a)	Explain Kruskal's algorithm with an example. Derive the complexity also.	[5]	3	3
Q.4(b)	Explain the concept of 4 queens problem.	[5]	2	2
Q.5(a)	Define NP-Hard and NP-complete problems.	[5]	2	2
Q.5(b)	Explain the concept of polynomial time reducibility.	[5]	3	3

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