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

CLASS: MTECH **SEMESTER : II**
BRANCH: CSE **SESSION : SP/2023**

SUBJECT: CS509 ADVANCED COMPUTER ALGORITHMS

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)	Apply the Dynamic programming approach to find the solution for Matrix multiplication problem.	[5]	CO1	BT3
Q.1(b)	Illustrate the backtracking technique by solving the graph colouring problem.	[5]	CO1	BT4
Q.2(a)	The Vertex cover problem is NP complete. Justify this by reduction from the 3-SAT problem.	[5]	CO2	BT6
Q.2(b)	Write the NP completeness proof for the Independent set problem.	[5]	CO2	BT5
Q.3(a)	Formulate an MST based approximation algorithm to solve the Travelling salesman problem.	[5]	CO3	BT5
Q.3(b)	Develop an approximation algorithm for the Vertex cover problem. Justify that the approximation ratio of the algorithm is 2.	[5]	CO3	BT5
Q.4(a)	Write a note on Multiprocessor models for parallel algorithms. What is Amdahl's law?	[5]	CO4	BT5
Q.4(b)	Elaborate on developing parallel algorithmic techniques based on Divide and Conquer.	[5]	CO4	BT2
Q.5(a)	Differentiate between Las Vegas and Monte Carlo Randomized algorithms.	[5]	CO5	BT4
Q.5(b)	Explain the Kerger's algorithm for solving the Min cut problem. Illustrate with an example.	[5]	CO5	BT5

::::::24/04/2023::::::E