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MIT WORLD PEACE UNIVERSITY | PUNE

PRN:

End Semester Examination

May-June 2023

CET3001B - Design and Analysis of Algorithms

Schedule ID: 18765

Faculty/School	Faculty of Engineering & Technology	**Term**	IV
Program	Second Year,B. Tech	**Duration**	**1 Hours 30 Minutes**
Specialization		**Max. Marks**	**40**

Read the instructions provided for every question properly before attempting the answer.

Section - 1 : contain(s) **10** question(s) and each question carries **5** mark(s).You can answer any **8** questions out of **10.**

Click **Finish** only after completion of the Exam.

Section - 1 (8 X 5 Marks)
Answer any 8 questions

1	Discuss Proof Techniques and explain the following with examples: 1) Proof by contradiction 2) Proof by mathematical induction	**5 marks**	CO1	Understanding
2	Solve the following elements using merge sort: E, X, A, M, P, L, E in alphabetical order. Write its complexity equation and complexity - best case, worst case and average case.	**5 marks**	CO2	Analysing
3	Consider a Knapsack instance n=3, (W1,W2,W3)=(2,3,4),(P1,P2,P3)= (1,2,5) and M=6. Find optimal solution using dynamic programming	**5 marks**	CO3	Applying
4	Discuss and derive an equation for finding the longest common subsequence using dynamic programming method. Design and analyse the algorithm for the same.	**5 marks**	CO3	Understanding
5	Describe Travelling Salesperson Problem (TSP) using Dynamic Programming	**5 marks**	CO3	Understanding
6	Write an algorithm to solve n queen problem using Backtracking	**5 marks**	CO4	Remembering

7	Select optimal subset J with an optimal penalty for the following data. What will be the penalty corresponding to the optimal solution? Job Pi di ti 1 5 1 1 2 10 3 2 3 6 2 1 4 3 1 1 Draw a State Space Tree and Compute C^, U and Upper for each node.	**5 marks**	CO4	Applying
8	Explain in detail Control Abstraction of LC Search	**5 marks**	CO4	Understanding
9	What are steps to prove NP-completeness of a problem? Prove that vertex cover problem is NP-complete.	**5 marks**	CO5	Evaluating
10	Differentiate between deterministic and non-deterministic algorithm with example	**5 marks**	CO5	Applying

END OF QUESTION PAPER