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Roll No

CS/IT-404 (GS)
B.E. IV Semester Examination, June 2020
Grading System (GS)
Analysis and Design of Algorithms
Time : Three Hours

Maximum Marks : 70

- Note:** i) Attempt any five questions.
ii) All questions carry equal marks.

1. Why do we use asymptotic notations in the study of algorithms? Briefly describe the commonly used asymptotic notation.
2. Solve the Travelling Salesman problem having the following cost matrix using branch and bound technique:

	A	B	C	D
A	x	5	2	3
B	4	x	2	3
C	4	2	x	3
D	7	6	8	x

3. Explain Floyd Warshall algorithm for finding the shortest path between all nodes in a graph using suitable example.
4. Define the following terms:
 - i) Algorithm
 - ii) Time complexity
 - iii) Tree
 - iv) Siblings
 - v) Degree of Tree
 - vi) Divide and Conquer
 - vii) Depth of Tree
5. Explain N queens problems? Give solution of 4 queens and 8 queen's problem using Backtracking methods.
6. Find an optimal merge pattern for 11 files whose lengths are 46, 35, 10, 14, 78, 6, 31, 2, 27. Write and explain the algorithm used and find its complexity.

OR

- a) Explain Heap sort algorithms?
- b) What is B-trees and 2-3 trees?

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7. a) Explain Backtracking problem? What are two types of constraints used in Backtracking?
b) Explain Inorder, preorder traversal with taking a suitable example.

OR

Explain multistage graph and 0/1 Knapsack problem.

8. Write short notes on any three of the following:

- i) Tree Traversing Techniques.
- ii) NP - Completeness.
- iii) B-Tree.
- iv) Hamiltonian Cycle.
- v) Floyd - Warshall Algorithm.
