

**A-1303**

Total Pages : 3

Roll No. ....

**MCS-507**  
**(MCA/MSCIT)**

**Design and Analysis of Algorithm**

Examination February, 2026

Time : 2:00 Hrs.

Max. Marks : 70

*Note :-* This paper is of Seventy (70) marks divided into Two (02) Sections ‘A’ and ‘B’. Attempt the questions contained in these Sections according to the detailed instructions given therein. *Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.*

**Section–A**

**(Long Answer Type Questions) (2×19=38)**

*Note :-* Section ‘A’ contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any *two* (02) questions only.

**A-1303**

( 1 )

P.T.O.

1. Describe Travelling Salesperson Problem (TSP) using Dynamic Programming.
2. Discuss in detail about the class P, NP, NP-hard and NP-complete problems. Give examples for each class.
3. How 8-Queen's problem can be solved using back tracking and explain with an example.
4. Explain Prim's algorithm for minimal spanning tree with an example
5. Explain the following terms with an example.
  - (i) Time and Space complexity,
  - (ii) Binary Search Tree
  - (iii) Floyd Algorithm
  - (iv) Huffman Algorithm

### **Section-B**

**(Short Answer Type Questions) (4×8=32)**

**Note :-** Section 'B' contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. What is Algorithm ? What are the Characteristics of Algorithm ?

2. Write an algorithm for insertion sort and find its complexity in best, average and worst cases.
3. What do you understand by divide-and-conquer algorithm approach ? What are the advantages and disadvantages of Divide and Conquer Paradigm ?
4. Write a short note on Branch and Bound Techniques.
5. Explain the differences between Bellman-Ford and Dijkstra algorithms.
6. Write in detail about Hamiltonian cycles. Give an example to it.
7. What is DFS Search ? Explain.
8. What are Randomized Algorithms ? Explain the types of Randomized Algorithms.

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