



ST. FRANCIS DE SALES COLLEGE

A FRANSALIAN INSTITUTE OF HIGHER EDUCATION **AUTONOMOUS**

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END SEMESTER EXAMINATION – AUGUST 2025 COMPUTER SCIENCE- II SEMESTER MCA 24MCA25 – DESIGN AND ANALYSIS OF ALGORITHMS

Time: 3 Hours

Max. Marks: 70

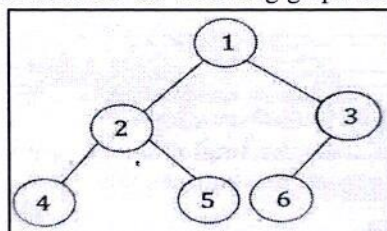
Instruction: Answer should be written completely in English.

SECTION - A

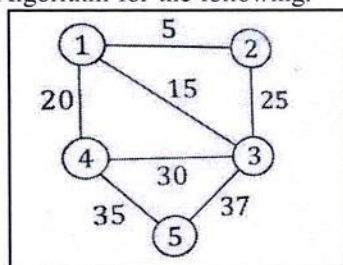
Answer any **FIVE** questions. Each question carries **SIX** marks each.

(5X6=30)

1. Explain Fundamental steps of Algorithmic Problem Solving
2. Differentiate between space complexity and time complexity. Why are these important in algorithm analysis?
3. Using binary search, find the position of the key '25' in the array [5, 10, 15, 20, 25, 30, 35]. Show all steps.
4. Apply the Merge Sort algorithm to sort the array [12, 4, 7, 3, 9, 1]. Show intermediate steps clearly.
5. Explain the general method of the greedy technique with a suitable example.
6. Perform BFS traversal on the following graph and write the order of traversal.



7. Apply PRIM's Algorithm for the following.



8. Illustrate how Branch and bound strategy can be applied to solve 8 queens' problem.

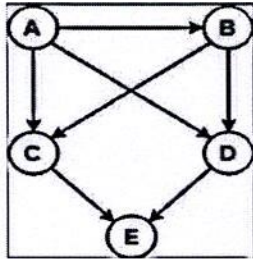


SECTION - B

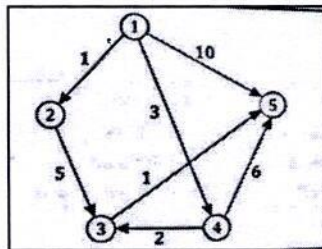
Answer any **FOUR** questions. Each question carries **TEN** marks each.

(4X10=40)

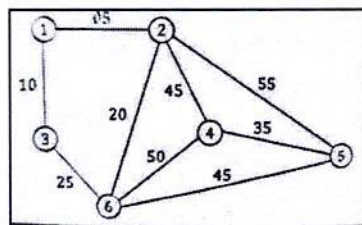
9. Define Asymptotic Notations. Explain the different notations in detail
10. Analyze the working of the Horspool algorithm and compare its performance with brute-force string matching.
11. Explain decrease and conquer strategy, solve the following graph for topological sorting.



12. Explain Dijkstra's Algorithm for single shortest path for the following.



13. Analyse the working of Kruskal's algorithm for finding the Minimum Spanning Tree. Illustrate for the following



14. Explain Traveling salesman problem for the following graph using branch and bound, Kindly note node **b** cannot be before **c**

