

(No additional sheet will be supplied)

PART – A (5 x 3 = 15 marks)

Answer any FIVE Questions.

Each question carries 3 marks

Each answer should not exceed 1 page.

1. Differentiate Best, Average, Worst case Complexity calculations.
2. Define Time and Space Complexities with an example.
3. What is Multistage Graph?
4. Write short notes on Minimum Spanning Tree?
5. What is Hamiltonian Cycle? Give an example.
6. What is the objective of 0/1 knapsack problem?
7. Define Comparison Tree?
8. Differentiate NP-Hard and NP-Completeness?

PART – B (4 x15= 60 marks)

Answer all Questions.

Each question carries 15 marks

Each answer should not exceed 6 pages

9. Explain the procedure of constructing Binary Search Tree with proper example?
(OR)
10. Explain the Analysis of Quick Sort? Calculate the Best Average and Worst case time complexities?
11. Find an optimal solution to the knapsack instance Find an optimal solution to the knapsack instance $n = 7, M = 15, (p_1, p_2, \dots, p_7) = (10, 5, 15, 7, 6, 18, 3)$ and $(w_1, w_2, \dots, w_7) = (2, 3, 5, 7, 1, 4, 1)$?
(OR)
12. Write the Container Loading greedy algorithm and explain?
13. Describe Backtracking solution to 8-Queens problem?
(OR)
14. Explain Graph Coloring algorithm with neat diagram?
15. Write and Explain the Cook's Theorem?
(OR)
16. Write and explain a non-deterministic algorithm to find whether a given graph contains a Hamiltonian cycle.