

MAY 2023

**P/ID 17609/PCA3G/
PIT3G/PCATD**

Time : Three hours

Maximum : 80 marks

PART A — (10 × 2 = 20 marks)

Answer any TEN questions

1. Define the term Algorithm.
2. What is indirect recursion?
3. State the recurrence relation for merge sort.
4. What is the space complexity of binary search?
5. State knapsack problem.
6. Write down the difference between greedy method and Dynamic programming.
7. What is BFS?
8. Define backtracking.
9. What is meant by articulation point?
10. What is chromatic number in graph coloring?

11. How to identify whether the 2 Queens are in the same diagonal?
12. How NP hard problems are solved?

PART B — ($5 \times 6 = 30$ marks)

Answer any FIVE questions

13. Write the essential characteristics of an algorithm and illustrate with an example.
14. Write brief notes on space complexity.
15. Explain depth first search and traversal.
16. Give the control abstraction of greedy method.
17. Give a brief account on multistage graphs of dynamic programming.
18. Discuss on Hamiltonian cycles with examples.
19. What is meant by NP-Hard and NP-Complete problem? Explain.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions

20. Explain recursive algorithms with an example.
 21. Explain tree vertex splitting problem, with suitable application and solution.
 22. How do you obtain the shortest path in a given graph? Write suitable algorithm.
 23. Explain the travelling salesman problem using backtracking approach.
 24. Explain lower bound theory for ordered searching.
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