P/ID 17609/PCA3G/ PIT3G/PCATD

Time : Three hours   Maximum : 80 marks

PART A — (10 × 2 = 20 marks)

Answer any TEN questions.

1.   Define Divide and Conquer strategy.

2.   Write down the advantages of randomized algorithms.

3.   What is the main idea behind selection sort?

4.   Write down the principle of optimality.

5.   What is called job sequencing with deadlines?

6.   What are called biconnected components?

7.   What is DFS?

8.   When vertex splitting is employed?

9.   List down the search techniques for graphs.

10. Give the statement of eight Queens problem.

11. What are called comparison trees?

12. Define NP hard problem.

PART B — (5 × 6 = 30 marks)

Answer any FIVE questions.

13. Write short notes on pseudocode conventions.

14. Write an algorithm to find the kth smallest element.

15. Explain Quicksort algorithm with suitable example.

16. What are the problems in string editing? How do they get addressed?

17. Explain DFS algorithm with an example.

18. Illustrate Hamiltonian cycle with an example.

19. Explain oracles and adversary arguments.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

20. Write and explain the algorithms to find the maximum and minimum values in a set of elements.

21. Explain Strassen's Matrix multiplication.

22. Describe 0/1 Knapsack problem.

23. Use branch and bound method to solve the following travelling sales person instance defined by the cost matrix.

To City

		1	2	3	4	5
	1	∞	7	3	12	8
	2	3	∞	6	14	9
From City	3	5	8	∞	6	18
	4	9	3	5	∞	11
	5	18	14	9	8	∞

24. Explain NP-hard scheduling problems.

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