

MAY 2022

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

Time : Three hours

Maximum : 80 marks

PART A — ($10 \times 2 = 20$ marks)

Answer any TEN questions.

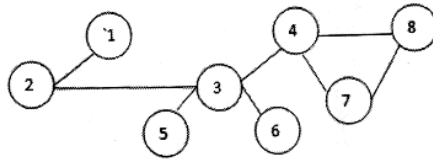
1. State the characteristics of algorithm.
2. Write an algorithm to find GCD of two numbers.
3. Tabulate worst case, average case and best case efficiencies of quick sort algorithm.
4. You are given 16 coins. One is defective. Use Divide and Conquer method to find out the defective coin. You can give a weighting machine. How many weight companions are done?
5. Define multistage graphs.
6. Compare dynamic programming and greedy method.
7. List out graph representation methods.
8. Explain state and state space tree with respect to backtracking method.

9. Define subset sum problem.
10. What is n-queen problem?
11. Write note on decision problem. Give example.
12. What is NP Completeness?

PART B — ($5 \times 6 = 30$ marks)

Answer any FIVE questions.

13. List out and explain various asymptotic notations.
14. Write an algorithm for matrix multiplication. Derive its complexity.
15. What is recursion? Give recursive algorithm for finding factorial of a given number.
16. Define articulation point and biconnected component. Identify articulation point and biconnected component for following graph.

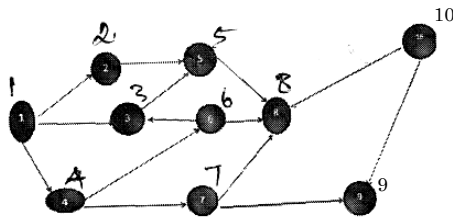


17. Explain string editing with example
18. What is graph coloring problem? Explain.
19. Explain the concept of NP hard problem.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

20. (a) Write merge sort algorithm. (5)
(b) Apply Merge sort algorithm to sort the list 45, 23, 42, 8, 56, 78, 33, 21 in order. (5)
21. Describe the procedure used in solving job sequencing with deadlines problem.
22. (a) Write DFS Algorithm. (5)
(b) Apply DFS algorithm on following graph from node 1. Show intermediate steps. (5)



23. Explain Dijkstra's algorithm with suitable example
24. Write note on
(a) Lower bound theory (5)
(b) TSP problem and finding solution (5)