



QP CODE: 21100809



Reg No : .....

Name : .....

**B.Sc/BCA DEGREE (CBCS) EXAMINATION, MARCH 2021**

**Fourth Semester**

**Core Course - CS4CRT09 - DESIGN AND ANALYSIS OF ALGORITHMS**

(Common for B.Sc Information Technology Model III, Bachelor of Computer Application)

2017 Admission onwards

78765EF5

Time: 3 Hours

Max. Marks : 80

**Part A**

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. What is space complexity?
2. What is worst-case complexity?
3. Describe binary search method.
4. Describe the recurrence relation of mergesort.
5. Discuss the part of partitioning algorithm in quicksort algorithm.
6. Write the control abstraction of the greedy strategy.
7. What is spanning tree? Give example.
8. What are the features of dynamic programming?
9. What is 0/1 knapsack problem?
10. List the applications of Travelling Sales Persons Problem.
11. How do you determine the efficiency of Backtracking programs?
12. What is graph coloring?

(10×2=20)

**Part B**

*Answer any **six** questions.*

*Each question carries **5** marks.*





13. Explain the characteristics for an algorithm.
14. Briefly explain the different algorithm design techniques.
15. Discuss with justification that Strassen's Matrix Multiplication brings the improvement over the ordinary matrix multiplication.
16. State the Greedy Knapsack Problem.
17. Find an optimal solution to the knapsack instance  $n=7$  objects and the capacity of knapsack  $m=15$ ,  $(p_1, p_2, p_3, \dots, p_7) = (10, 5, 7, 6, 18, 3)$  and  $(w_1, w_2, w_3, \dots, w_7) = (2, 3, 5, 7, 1, 4, 1)$ .
18. Explain multistage graph backward method with algorithm.
19. What is single source shortest path? Explain with algorithm.
20. Explain biconnected components and DFS.
21. Write a recursive algorithm to find all the hamiltonian cycles of a given graph.

(6×5=30)

### Part C

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. Explain in detail Algorithm performance analysis.
23. Explain the divide and conquer method. With an algorithm explain anyone application.
24. What is Minimum Cost Spanning tree? Explain the Prim's algorithm with suitable example.
25. Explain with alogrithm the breadth-first search and depth-first search graph traversal methods.

(2×15=30)

