20100809

**QP CODE: 20100809**

**Reg No :** .....

**Name :** .....

## B.Sc/BCA DEGREE (CBCS) EXAMINATION, MARCH 2020

### 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

87DB30BA

Time: 3 Hours Marks: 80

**Part A**

*Answer any **ten** questions.*

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

1. What is an algorithm?
2. Explain Space complexity.
3. Discuss the general method of divide and conquer.
4. Write the complexity of merge sort.
5. Quicksort is more efficient than mergesort. Judge your answer.
6. What is ordering paradigm?
7. Define Kruskal's algorithm.
8. What you meant by Dynamic programming with Examples?
9. Write Bellman and Ford algorithm to compute the shortest paths.
10. What is travelling sales person problem?
11. Which data structure is used for implementing BFS traversal?
12. Define biconnected component.

(10×2=20)

**Part B**

*Answer any **six** questions.*

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

13. Write notes on algorithm analysis.
14. With an example explain the best-case, worst-case and average-case complexities of an algorithm.
15. Demonstrate the analysis of binary search algorithm using recursive binary tree method.
16. Write the characterstics of Greedy algorithm.
17. Find an optimal solution to the knapsack instance n=4 objects and the capacity of knapsack m=15, profits(10,5,7,11) and weights are (3,4,3,5).
18. Discuss the forward approach in multistage graph problem with example.
19. Explain 0/1 knapsack problem with algorithm.
20. Explain 8-Queen's problem with an example.
21. Write algorithm to find hamiltonian path using backtracking.

(6×5=30)

**Part C**

*Answer any **two** questions.*

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

22. Elaborate various algorithm design strategies.
23. Discuss in detail about the procedure for Strassen's Matrix Multiplication. Illustrate with an example.
24. Write a note on greedy technique. Explain Prim's algorithm with example using greedy technique.
25. Explain backtracking algorithm. Apply backtracking to solve the following instance of the sum of subset problem. Set of elements = {3, 5, 6, 7} and d = 15

(2×15=30)