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Reg. No.................................

Name.....................................

M.Sc. COMPUTER SCIENCE (C.S.S.) DEGREE (SPECIAL MERCY CHANCE) EXAMINATION, JANUARY 2025

Third Semester

MCS 3C3–DESIGN AND ANALYSIS OF ALGORITHMS

(2012–14 Admissions)

Time : Three Hours

Maximum Weight : 30

Part A

Answer any **five** *questions.*
Each question carries a weight of 1.

1. What is space complexity ?
2. Define the divide and conquer method.
3. What is greedy method ?
4. Define dynamic programming.
5. Define 0/1 knapsack problem.
6. State Sum of Subsets problem.
7. What is NP- hard and NP-complete problems ?
8. What are Biconnected components ?

(5 × 1 = 5)

Part B

Answer any **five** *questions.*
Each question carries a weight of 2.

9. List out the steps that need to design an algorithm.
10. Differentiate between best, average and worst-case efficiency.
11. Write an algorithm for sorting the given elements using Merge sort.
12. Write control abstraction for greedy method.
13. What is travelling sales person problem ? Explain with example.
14. What is backtracking ? Give the solution for the 8 queens problem.
15. What are the applications of branch and bound ? Explain.
16. Write an algorithm and explain how to determine biconnected components.

(5 × 2 = 10)

Turn over

Part C

Answer any **three** *questions.*
Each question carries a weight of 5.

17. Explain the notations used to compare and rank the order of growth of algorithm with a suitable example.
18. Write an algorithm to sort given elements using quick sort and find the time efficiency.
19. Write and explain Prim's algorithm to construct a minimum cost spanning tree.
20. Explain the All-Pair shortest paths problem with an example.
21. Explain the general method of branch and bound.
22. Describe in detail graph coloring using back tracking.

(3 × 5 = 15)