

SECOND SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2024
(Regular/Improvement/Supplementary)
COMPUTER SCIENCE
FCSS2C06-DESIGN AND ANALYSIS OF ALGORITHMS

Time: 3 Hours**Maximum Weightage: 30****Section A: Short answer questions. Answer any *four* questions. Each carries 2 weightage.**

1. Give an example for an NP Complete problem and state why it belongs to NPC.
2. Write a note on the various methods for specifying an algorithm.
3. What are Big Oh Ratio Theorem, Big Omega Ratio Theorem and Big Theta Ratio Theorem?
4. State and explain Amdahl's law.
5. What is a combinatorial problem? Give an example.
6. What is *sum of subset* problem? Give examples.
7. Write a note on Euler tour representation (ETR).

(4 × 2 = 8 weightage)

Section B: Short essay questions. Answer any *four* questions. Each carries 3 weightage.

8. Explain the importance of algorithm analysis in terms of time and space complexities.
9. Discuss the steps in developing algorithms.
10. Elaborate the basic concepts of dynamic programming. Compare it with the greedy method.
11. Explain the Brute force approach for string matching.
12. Analyse Strassen's matrix multiplication and derive its complexity.
13. Briefly explain the various measures for computing the performance of a parallel algorithm.
14. Delineate the concept of complexity classes with examples.

(4 × 3 = 12 weightage)

Section C: Essay questions. Answer any *two* questions. Each carries 5 weightage.

15. Explain any three methods for solving recurrences with examples.
16. a) Explain the concept of parallel prefix computation in detail.
b) Explain any one parallel sorting algorithm.
17. What do you mean by NP Completeness Reduction? Explain NP Completeness Reduction for Hamiltonian cycle problem and traveling salesman problem.
18. Explain the concept of Branch and Bound technique for designing efficient algorithms. Solve Knapsack problem using Branch and Bound technique.

(2 × 5 = 10 weightage)