

19P264

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Name.....

Reg. No.....

SECOND SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2020

(CUCSS - PG)

CC19P CSS2 C06 - DESIGN AND ANALYSIS OF ALGORITHMS

(Computer Science)

(2019 Admissions: Regular)

Time: Three Hours

Maximum: 30 Weightage

Part A

Answer any *four* questions. Each question carries 2 weightage.

1. Define algorithm. List different steps of an algorithm.
2. State the differences between dynamic programming and backtracking.
3. Define Big Oh, Omega and Theta notations. Depict the same graphically.
4. Suggest an approximation algorithm for travelling salesman problem.
5. Briefly explain the concept of parallelism.
6. "Quick sort is not a stable algorithm". Do you agree with this statement? Explain.
7. Discuss various methods used for mathematical analysis of recursive algorithms.

(4 x 2 = 8 Weightage)

Part B

Answer any *four* questions. Each question carries 3 weightage.

8. Briefly explain RAM model of serial computation with an example.
9. Illustrate Knapsack Problem with its complexity.
10. Explain Master's theorem. Find the complexity of the recurrence relation
$$T(n) = 2T(n/4) + n^{0.51}$$
11. Describe the computation of prefix sums with a suitable example.
12. Explain the working of Strassen's matrix multiplication with the help of divide and conquer method.
13. Discuss the approximation algorithm for NP-hard problems.
14. Differentiate between Kruskal's and Prim's algorithms with examples.

(4 x 3 = 12 Weightage)

Part C

Answer any *two* questions. Each question carries 5 weightage.

15. Discuss merge sort algorithm with an example. Give its recurrence relation.
16. Describe Hamiltonian circuit problem. Illustrate the procedure to find Hamiltonian circuit of a graph.

17. a) State and prove Amdahl's law.
b) Discuss various properties of parallel algorithms.
18. Explain PRAM model with its constraints.

(2 x 5 = 10 Weightage)
