

17P266

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Name.....

Reg. No.....

SECOND SEMESTER M.Sc. DEGREE EXAMINATION, MAY 2018

(CUCSS - PG)

(Computer Science)

CC17P CSS2 C01 - DESIGN AND ANALYSIS OF ALGORITHMS

(2017 Admissions: Regular)

Time: Three Hours

Maximum: 36 Weightage

PART A

Answer *all* questions. Each question carries 1 weightage.

1. Differentiate Time Complexity from Space complexity.
2. What is sum of sub set problem?
3. List out the properties of an algorithm.
4. Define Amdahl's law.
5. What is the drawback of greedy algorithm?
6. What is Clique?
7. Define big Omega ratio theorem.
8. What is a recurrence equation?
9. What is spanning tree? Give an example.
10. Define NP Hard and NP Completeness.
11. Write a note on Euler tour technique.
12. What is amortized analysis?

(12 x 1 = 12 Weightage)

PART B

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

13. Describe all-pairs shortest path algorithm with example. Give the time complexity of the algorithm.
14. Explain Huffman code algorithm using an example.
15. Write the linear search algorithm and analyze for its best, worst and average case time complexity.
16. What is parallel computing? Why do we use it?
17. Explain merge sort problem using divide and conquer technique. Give an example.
18. How is dynamic programming applied to solve the travelling salesperson problem? Explain in detail with an example.

19. Define Master's theorem. Solve the following recurrence equation.

$$T(n) = 2T(n/2) + n \log n$$

20. Explain in detail about Parallel prefix computation.

21. With an example, explain how the branch-and-bound technique is used to solve 0/1 knapsack problem.

(6 x 2 = 12 Weightage)

PART C

Answer any *three* questions. Each question carries 4 weightage.

22. Compare and contrast important problem types.

23. Discuss in detail all the asymptotic notations with examples.

24. Explain the complexity classes. Elaborate the NP completeness reductions for clique, vertex cover, and Hamiltonian cycle.

25. Explain Strassen's Matrix Multiplication algorithm with an example.

26. Explain Prim's algorithm and analyze its complexity with an example.

27. What is Hamiltonian problem? Explain with an example using backtracking.

(3 x 4 = 12 Weightage)
