C 4716 **(Pages : 2)** **Name.....**

Reg. No.....

SECOND SEMESTER M.Sc. DEGREE EXAMINATION, JUNE 2016

(CUCSS)

Computer Science

CSS 2C 01—DESIGN AND ANALYSIS OF ALGORITHMS

(2014 Admissions)

Time : Three Hours Maximum : 36 Weightage

Part A

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

1. What is a RAM Model ?
2. What do you mean by Amortized analysis ?
3. Define Big Omega. What is its significance ?
4. Give *four* examples of Divide and Conquer algorithms.
5. Explain Travelling Salesman Problem.
6. Name any one algorithm with Non-Polynomial complexity.
7. Define NP hard problem.
8. CRCW stands for
9. Name a problem which is an apt candidate for Branch and Bound strategy.
10. What do you mean by Write conflict ?
11. What do you mean by approximate algorithm 7
12. State Cook's theorem.

(12 x 1 = 12 weightage)

Part B

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

13. Give asymptotic upper and lower bounds for T (n) in the following recurrence. Assume T (n) is constant for n < = 2. Make your bounds as tight as possible : T (n) = 2 T (n/2) + n^3.

Turn over

14. Show that any comparison algorithm requires Ω (n log n) comparisons in the worst case.

15. Explain the basic principle of Dynamic programming.

16. Compare backtracking and Branch and **Bound.**

17. Prove that if any NP complete problem is Polynomial time solvable then P = NP.

18. Explain Clique problem.

19. Give a Greedy Solution for Knapsack problem.

20. Explain Brent's theorem.

21. Explain parallel merging.

(6 x 2 = 12 weightage)

Part C

Answer any* three *full questions.
Each Question carries* 4 *weightage.

22. Perform average case analysis **of Quick sort.**

23. Give an overview of analysis of Knuth-Morris-Pratt **algorithm.**

24. (a) Write and explain Kruskel's algorithm.

(b) Discuss a dynamic algorithm for optimal Binary Search Tree.

25. Explain Vertex Cover Problem. Show that Vertex Cover **Problem** is NP Complete.

26. Discuss PRAM models and relation between them.

27. Discuss parallel algorithm to find Connected components.

(3 x 4 = 12 weightage)