

**SECOND SEMESTER M.Sc. DEGREE EXAMINATION, JUNE 2015**

(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. Differentiate Little Oh and Big Oh.
2. Worst case performance of Quick sort is \_\_\_\_\_
3. Define Randomized algorithm.
4. Give four examples of Dynamic programming.
5. List the advantages of Divide and Conquer strategy.
6. Explain Travelling salesman Problem.
7. Give an example of NP hard problem.
8. Define NP Complete problem.
9. Define the term PRAM.
10. **EREW** stands for \_\_\_\_\_
11. Define super vertex and Star in connected components.
12. Define approximation algorithms.

(12 x 1 = 12 weightage)

**Part B***Answer **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  $n \leq 2$ . Make your bounds as tight as possible:  $T(n) = 2T\left(\frac{n}{2}\right) + n^3$
14. Bring out the relevance of Amortized weight balanced Tree.
15. Explain the basic principle of Backtracking.
16. Compare Dynamic and Greedy approaches.

**Turn over**

17. Explain the term "Reducibility of an lgorithm".
18. Explain Subset Sum problem.
19. Discuss handling of Write conflict in PRAM model.
20. Give a Greedy Solution for Knapsack problem.
21. Briefly explain any one approach for parallel sorting.

(6 x 2 = 12 weightage)

### Part C

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

22. Show that worst-case running time of Heap sort is  $\Omega(n \log n)$ .
23. Perform average case analysis of Binary search.
24. Write and explain Floyd-Warshall algorithm.
25. Explain Vertex Cover Problem. Show that Vertex Cover Problem is NP Complete.
26. Discuss PRAM models and relations between them.
27. Discuss parallel Prefix computation.

(3 x 4 = 12 weightage)