



(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 110753

Roll No.

--	--	--	--	--	--	--	--	--	--

B. Tech.

(SEM. VII) (ODD SEM.) THEORY EXAMINATION, 2014-15 PARALLEL ALGORITHMS

Time : 3 Hours]

[Total Marks : 100

Note : Attempt all questions

1 Attempt any four parts of the following : $5 \times 4 = 20$

- Write the PRAM algorithm for List Ranking problem.
- Explain how a pyramid network is superior to mesh and tree models.
- According to you, which processor organization is the best? Justify the answer along with different parameters.
- Write and prove Brent's Theorem?
- Write the CREW PRAM algorithm for Graph Coloring problem and Discuss with suitable example.
- Define Cost and Speedup in parallel algorithms. How can you determine the efficiency of parallel algorithms?

2 Attempt any **four** parts of the following : $5 \times 4 = 20$

- (a) Write and discuss a Cost optimal Parallel Algorithm to find Prefix Sums.
- (b) What is cost optimality ? Give an example that illustrates Cost optimal algorithms.
- (c) Write a Parallel algorithm to merge two sorted lists of $n/2$ elements each.
- (d) What are Sorting Networks ? Discuss its working with example.
- (e) Discuss any two processor organizations used in Parallel Computers.
- (f) Write the PRAM algorithm to label the nodes of a tree according to their position in a preorder traversal.

3 Attempt any **two** parts of the following : $10 \times 2 = 20$

- (a) Write the PRAM algorithm for Merging two Sorted Lists and Discuss it working with suitable example.
- (b) (i) What are Sorting Networks. Discuss its working with an example.
(ii) Discuss Bitonic Merge with some suitable example.
- (c) (i) Write the algorithm for Odd-Even Transposition sort.
(ii) What do you understand by Parallel sorting? Write and discuss the Algorithm for Enumeration Sort.

4 Attempt any **two** parts of the following : $10 \times 2 = 20$

- (a) (i) Briefly discuss about solution of linear equations.
(ii) Write the PRAM algorithm to label the nodes of a tree according to their position in a preorder traversal.
- (b) (i) Discuss one parallel searching algorithm.
(ii) Write and discuss one parallel matrix multiplication algorithm ?
- (c) (i) Briefly discuss Prefix Sums PRAM algorithm for n elements using $n-1$ processors also discuss its complexity.
(ii) How can you simulate one model from another ?

5 Attempt any **two** parts of the following : $10 \times 2 = 20$

- (a) (i) What is the concept of Root finding? Discuss Newton's method.
(ii) What is Min/Max on various models?
- (b) (i) What is permutations in combinatorics ?
(ii) Discuss parallel Branch and Bound algorithm for TSP problem.
- (c) (i) Discuss one parallel version of single source shortest path algorithm.
(ii) Write and discuss a parallel matrix transportation algorithm on PRAM.