53 (CS 714) PRCO

2017

PARALLEL COMPUTING

Paper : CS 714

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Attempt ***all*** *questions.*

1. *(a)* Write a PRAM algorithm to compute the prefix sum of an array.

   (b) Compute the time complexity and compare with the time complexity of a linear prefix sum algorithm. 10+10

2. *(a)* Write a PRAM algorithm to merge two sorted list into a single list. Compute the time complexity of your algorithm.

   (b) Apply your algorithm on the given data

   | 3 | 9 | 15 |

   | 1 | 2 | 7 |

   10+10

3. *(a)* Define the terms with examples :

(i) diameter

(ii) bisection width

(b) Compute diameter and bisection width for the following network :

(i) 2-D mesh

(ii) Binary tree

(iii) Cube connected cycles

(iv) Pyramid. 4+16

4. *(a)* With example discuss about bitonic sequence.

(b) Perform bitonic merge sort on the following array

3	20	1	5	9	18	7	14

5+15

5. *(a)* With example discuss about the list ranking algorithm.

(b) Prove that a mesh with an odd number of rows and columns cannot be embedded into a ring without increasing the dialation beyond 1.

10+10