53 (CS 714) PRCP

2018

PARALLEL COMPUTING

Paper : CS 714

Full Marks : 100

Time : Three hours

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

Answer ***all*** *questions.*

1. *(a)* Write a parallel algorithm to find whether an element is present in an array or not.

   (b) Compute the complexity of this algorithm and compare with the linear search algorithm.

   (c) Consider the following array and apply your parallel search algorithm consider the search element as "2".

2	5	11	3	7	6	2

10+5+5

Contd.

2. *(a)* Design a PRAM algorithm to merge two sorted array into a single sorted array.

(b) Compute the complexity of your PRAM algo.

(c) Apply your algorithm on the following data

11	23	33	44

22	88	91	93

10+5+5

3. *(a)* Define the terms : diameter and bisection width.

(b) Why low diameter, high bisection width is preferred in parallel computing ?

(c) Compute the diameter and bisection width for the following networks :

(i) 2D Mesh without wrap around

(ii) binary tree. 5+5+(5+5)

4. *(a)* Show that a complete binary tree of height greater than 4 cannot be embedded in a 2D mesh without increasing the dialation beyond 1.

(b) Design a PRAM algorithm for matrix multiplication. 10+10

5. Write short notes on : 4×5=20

(a) Shuffle exchange network

(b) Bitonic sequence

(c) Parallel quick sort

(d) Embedding dialation and load.