Reg. No.

B.E./B.Tech. DEGREE EXAMINATIONS APRIL / MAY 2021

Eighth Semester

Computer Science Engineering

CS8001 - PARALLEL ALGORITHMS

(Regulations 2017)

Time : 3 Hours   Answer ALL Questions   Max. Marks: 100

PART-A (10 x 2 = 20 Marks)

1. What is logical and physical organization of parallel programming platforms?
2. What is PRAM Model?
3. Expand the terms EREW and CREW.
4. List the two phases of PRAM algorithm.
5. What is SIMD?
6. What is the lower bound for any computation on that model if the diameter for a model is d?
7. How many processors in a d-dimensional hypercube if each node of a d-dimensional hypercube is numbered using d-bits?
8. Write the advantage of using parallel algorithm in reduction.
9. Draw a sketch for typical MIMD architecture.
10. Draw a sketch for typical shared address space architecture of UMA.

Part – B (5 x 13 = 65 Marks)

11. a) What is PRAM Model? What are the subclasses of PRAM? (13)

OR

    b) Write short notes on Shared Memory & Message Passing Models. (13)

12. a) Write down the steps of PRAM algorithm reduction with example of Prefix sum calculations. (13)

OR

b) Write down the steps of PRAM algorithm reduction with example of matrix multiplications. (13)

13. a) Write notes on design issues for network SIMD models. (13)

OR

b) Write notes on strength an weakness of 2d meshes also develop a simple 2D mesh sorting algorithm. (13)

14. a) Write down the purpose of parallel algorithm. Explain with example of Bitonic sort. (13)

OR

b) Demonstrate the advantage of parallel algorithm with example of matrix multiplication. (13)

15. a) Write notes on multiprocessors and multicomputer with example of matrix multiplication. (13)

OR

b) Write notes on mapping data to processors with simple example. (13)

PART- C (1 x 15 = 15 Marks)

16. a) Let A = { 5,2,4,5} be a sequence and p = 16 where p is no processors. Sort this sequence by using Enumeration sort algorithm for CRCW technique and show each step. Also write algorithm. (15)

OR

b) Given a set of n values $a_1, a_2, a_3, \ldots\ldots\ldots a_n$ and an associative operation (f) the prefix sum problem is to compute the n quantities.

a_1

$a_1 + a_2$

$a_1 + a_2 + a_3$

$a_1 + a_2 + a_3 + \ldots\ldots\ldots\ldots + a_n$

Given an parallel algorithm to fin prefix sums of n-element using n-1 processors on PRAM model. (15)