Printed Pages: 4 NCS-063

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

Paper ID : 110663 Roll No.

B.TECH.

Theory Examination (Semester-VI) 2015-16

PARALLEL ALGORITHMS

*Time : 3 Hours* *Max. Marks : 100*

Section-A

**Q.1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. (2×10=20)**

(a) Define Cost and Speed-up in parallel algorithm.

(b) What do you mean by parallel algorithm and parallel computer?

(c) Write down the design strategies of parallel algorithm.

(d) Explain CRCW and ERCW computational model in brief.



Section-C

**Attempt any two questions from this section. (15×2=30)**

Q.3. What do you mean by cost optimal algorithm? Compute the speedup, cost and efficiency for addition of n numbers by using n/2 processors by parallel reduction (parallel sum) algorithm compared to sequential algorithm.

Q.4. 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 the algorithm.

Q.5. Write short notes on any two

(a) Parallel version algorithm for all-pair shortest paths

(b) Gauss method for solving linear system

(c) Parallel Kruskal's algorithm for MST.

(e) Differentiate between static and dynamic interconnection network.

(f) What is sequential alpha-beta search?

(g) Differentiate between sequential matrix multiplication and parallel matrix multiplication.

(h) Show the difficulties of solving linear equation on parallel machine in brief.

(i) Write two approaches used for dimensionality reduction.

(j) Compare sequential searching with parallel searching algorithm.

**Section-B**

**Q3. Attempt any five questions from this section. (10×5=50)**

(a) Explain sequential model and show the need of parallel model and explain any two following models

(i) Hypercube

(ii) Tree model

(iii) Butterfly



(b) Define the following

(i) Contrasting pipelining and data parallelism

(ii) Scalability

(c) Discuss the vector-matrix multiplication with the help of example.

(d) Explain even-odd transposition sort and shear sort algorithm with neat and clean diagrams.

(e) Discuss the combinatorial algorithms with suitable example.

(f) A p-processor PRIORITY PRAM can be simulated by a p-processor EREW PRAM with time complexity increased by a factor of $\Theta$ (log p). Prove it.

(g) Sort a list (C, D, B, H, E, G, F, A) using bitonic merge sort.

(h) Describe a quick sort algorithm suitable for implementation on hypercube multi-computers.

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