

**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.

**Printed Pages: 4**

**NCS-063**

<b>(Following Paper ID and Roll No. to be filled in your Answer Books)</b>																					
<b>Paper ID : 110663</b>	<b>Roll No.</b> <table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																				

**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.

- (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

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- (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 CREW 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.

(3)

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P.T.O.

**Section-C**

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**B.TECH.**

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**PARALLEL ALGORITHMS**

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**Section-A**

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