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

Paper ID :110753 Roll No. | | | | | | | | | | |

B.Tech.

(SEM. VII) THEORY EXAMINATION, 2015-16

PARALLEL ALGORITHMS

[Time:3 hours] **[Maximum 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) Describe efficiency and speed-up in parallel algorithm.

(b) What are the methods of sequential data communication?

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(c) Explain how theoretically parallel algorithms are analyzed.

(d) What do you mean by cost optimality of an algorithm?

(e) Write two approaches used for dimensionality reduction.

(f) What are the different types of components of execution time?

(g) Define the sequential model. Discuss the need of an alternative model.

(h) What is data parallelism? Is it similar to pipelining?

(i) Define cost optimal and non-cost optimal algorithm.

(j) What do you mean by parallelizability and scalability of an algorithm?

Section-B

Note: Attempt <u>any five</u> questions from this section.

$10 \times 5 = 50$

Q2. What are the various performance measures of parallel

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algorithm? Discuss with example.

Q3. Cost optimality is seen to judge the goodness of parallel algorithm. With the example of summation illustrate this concept.

Q4. Write down the parallel quick sort algorithm. Also analyze its time complexity.

Q5. Define the selection problem. Show that Ω(n is) the lower bound on the cost of any parallel algorithm for selection.

Q6. What do you mean by parallel sorting networks? Also discuss the enumeration sort algorithm.

Q7. Describe the Amdahl's law in detail. Explain the linear, sub linear, super linear and scaled speedup.

Q8. Discuss and write parallel matrix multiplication algorithm using PRAM model.

Q9. Using odd-even transposition sort to sort these sequences: Let X=(g,h,f,d,e,c,b,a). Assume there are foour processors and show each step.

Section-C

Note: Attempt any two questions from this section.

(15×2=30)

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Q10. What do 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.

Q11. Let A = {1,4,6,9,10,11,13,14,15,18,20,23,32,45,51} be the sequence to be searched. Illustrate the working procedure CREW_SERCH for x(index value)= 45. Given that p (no. of processors) = 3 and show each step.

Q12. What is Parallel Alpha Beta search? Explain in detail.

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