

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_SEARCH for $x(\text{index value}) = 45$. Given that $p(\text{no. of processors}) = 3$ and show each step.

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

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

Paper ID : 110753

Roll No.

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B.Tech.

(SEM. VII) THEORY EXAMINATION, 2015-16

PARALLEL ALGORITHMS

[Time: 3 hours]

[Total Marks: 100]

Section-A

Q1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. (10×2=20)

- (a) Describe efficiency and speed-up in parallel algorithm.
- (b) What are the methods of sequential data communication?
- (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

Attempt any five questions from this section.

5×10=50

- Q2. What are the various performance measures of parallel 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 $\Omega(n)$ 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 four processors and show each step.

Section-C

Attempt any two questions from this section.

(2×15=30)

- 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.