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

PAPER ID : 2710 Roll No. | | | | | | | | | | |

B.Tech.

(SEM. VII) ODD SEMESTER THEORY EXAMINATION 2012–13

PARALLEL ALGORITHMS

Time : 3 Hours *Total Marks : 100*

Note :– (i) Attempt **all** questions.

(ii) All questions carry equal marks.

1. Attempt any **two** of the following : **(10×2=20)**

(a) Explain RAM model of serial computation and PRAM model of parallel computation. Summarize the similarities and differences between them.

(b) Describe pyramid network processor organization for parallel computers. Find and describe the expression to determine the total numbers of processors in a pyramid network of size k^2.

(c) Describe butterfly network in brief. Devise a PRAM algorithm to multiply two n×n matrices, where $n = 2^k$.

2. Attempt any **two** of the following : **(10×2=20)**

(a) Write and describe the basic matrics and measures for analyzing the performance of parallel algorithms.

(b) Describe the cost optimal scheme to compute the partial sums of the following :

$$S_k = \sum_{i=1}^{k} x_i \qquad 1 \leq k \leq n$$

(c) Write short notes on data parallel approach and control parallel approach.

3. Attempt any **two** of the following : **(10×2=20)**

(a) What do you understand by parallel sorting ? Do you think it is accurate to describe odd even transposition sort as a parallel bubble sort. Justify your answer.

(b) Describe Bitonic sequence. Discuss the Bitonic merge on Shuffle-Exchange network.

(c) Describe a quicksort algorithm suitable for implementation on hypercube multicomputers.

4. Attempt any **two** of the following : **(10×2=20)**

(a) List the various parallel searching algorithms. Explain any one of them.

(b) What is back substitution method for solving linear equation ? Describe a parallel back substitution algorithm suitable for implementation on UMA multiprocessor.

(c) Discuss 2-D mesh SIMD model. Describe matrix multiplication on 2-D mesh SIMD model.

5. Attempt any **two** of the following : **(10×2=20)**

(a) Write the various types of parallel methods to find the connected components of an undirected graph. Explain any two of them.

(b) What is combinatorial search problem ? How a search problem can be represented by tree ? Describe a combinatorial searching problem solving methodology that can be represented by tree.

(c) Describe permutation, combination and derangements in brief.