

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**ME Semester –I Examination Feb. - 2012**

**Subject code: 710207N****Date: 21/02/2012****Subject Name: Parallel Computing****Time: 10.30 am – 01.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain the difference between pipelining and data parallelism with example. **07**
- (b) Explain PRAM model of parallel computation. **07**
- Q.2** (a) Answer the following questions. **04**
- (i) Define parallel processing. What is the need for parallel processing? **04**
- (ii) Differentiate between UMA and NUMA. **03**
- (b) Explain prefix sums parallel algorithm. **07**
- OR**
- (b) Explain list ranking parallel algorithm. **07**
- Q.3** (a) Describe, how rings and meshes can be embedded into hypercube containing  $P=2^d$  processors. **07**
- (b) Explain matrix multiplication on 2D mesh SIMD model. **07**
- OR**
- Q.3** (a) Explain Coffman-Graham scheduling algorithm with example. **07**
- (b) Explain matrix multiplication on shuffle exchange SIMD model. **07**
- Q.4** (a) Give odd-even reduction algorithm to solve a system of tridiagonal equations which can be parallelized. **07**
- (b) Explain row-column oriented matrix multiplication algorithm suitable for efficient parallelization on a multicomputer. **07**
- OR**
- Q.4** (a) Describe multiprocessor oriented parallel quick sort algorithm, with an example. **07**
- (b) Explain bitonic merge sort algorithm. **07**
- Q.5** (a) Parallelize Sollin's sequential minimum spanning tree algorithm. **07**
- (b) Explain parallel version of back substitution algorithm on UMA multiprocessor system. **07**
- OR**
- Q.5** (a) Define the connected components of an undirected graph. Explain the Hirschberg's connected component algorithm with the suitable example. **07**
- (b) Explain sequential alpha-beta search algorithm. **07**

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