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GUJARAT TECHNOLOGICAL UNIVERSITY ME - SEMESTER- I EXAMINATION - SUMMER 2013

Subject Code: 710207N Date: 17/06/2013 **Subject Name: Parallel Computing** Time: **Total Marks: 70 Instructions:** 1. Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. 4. Draw neat sketches wherever required. **Q.1** (a) What is a bitonic sequence? Using Bathcerøs bitonic merge sort algorithm, 07 sort the following sequence 8,10,11,3,4,7,17,2,15,6,16,9,5,12,14,13.Illustrate the same using a neat diagram. **(b)** Illustrate Coffman-Graham scheduling algorithm with an example. 07 **Q.2** (a) Differentiate between pipelining and data parallelism with appropriate 07 examples. **(b)** Explain the different phases of odd-even transposition sort algorithm? Sort 07 the following sequence: ZYXWVUTS OR (b) Explain row-column oriented matrix multiplication algorithm suitable for **07** efficient parallelization on a multicomputer. Q.3 (a) List and explain the connected components of an undirected graph. Explain the **07** Hirschberges connected component algorithm with an appropriate example. **(b)** Explain sequential alpha-beta search algorithm and also list the steps to 07 parallelize the same. OR Q.3Explain the operation of Parallel Reduction. Illustrate the operation of PRAM 07 algorithm to find the sum of following 10 values: 54931020674 **(b)** Explain the Preorder Tree Traversal Algorithm for CREW PRAM. **07 Q.4 07** (a) List and explain the anomalies in Parallel branch and bound Algorithms. 07 **(b)** Illustrate the Computing of variance of a list of numbers on a four node hypercube multicomputer with appropriate sketches. OR What are H-Trees? Explain with appropriate sketches. Also explain how 07 **Q.4** dilation -1 embedding of a binary tree of height 3 into a 2D mesh can be

implemented.

| | (b) | Explain the execution of Moore single source shortest path algorithm and also write the steps to parallelize it. | 07 |
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| Q.5 | (a) | Describe multiprocessor oriented parallel quick sort algorithm, with an example. | 07 |
| | (b) | Explain Kruskaløs minimum cost spanning tree algorithm. | 07 |
| | | OR | |
| Q.5 | (a) | Explain prefix sums parallel algorithm. | 07 |
| | (b) | Write Short Notes on : | 07 |
| | () | (i) H Trees | |
| | | (ii) Amdhleøs law | |
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