

GUJARAT TECHNOLOGICAL UNIVERSITY**MCA - SEMESTER-III • EXAMINATION – WINTER 2013****Subject Code: 650005****Date: 29-11-2013****Subject Name: Parallel Programming****Time: 02.30 am - 05.00 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) Define: SIMD, MIMD 02
 (b) What is difference between parallel computing and distributed computing? 02
 (c) List parallel processing technique used in uniprocessor 02
 (d) Comment: "Parallelism and performance are related, but they are not the same" 02
 (e) Define: Control dependency and resource dependency 02
 (f) What is pthread? 02
 (g) What is message passing model? 02
- Q.2** (a) What is shared memory programming? What are the basic constraint behind shared memory programming 07
 (b) Write parallel algorithm for histogram computation 07
OR
 (b) Explain general model of shared memory programming 07
- Q.3** (a) Write short note on interconnection networks 07
 (b) Write short note on symmetric multiprocessor architecture 05
 (c) List set of problems identified as the grand challenges for computing 02
OR
- Q.3** (a) What is P-RAM? Explain assumptions and constraints of it. 07
 (b) Explain two main goals of parallel processing 05
 (c) Differentiate: tightly coupled and loosely coupled processors 02
- Q.4** (a) Explain sources of performance loss in parallelism 04
 (b) Define: Speedup, Super-linear Speedup and efficiency 03
 (c) Explain program transformation techniques to avoid data dependency 07
OR
- Q.4** (a) Check whether following statements can be executed in parallel and find out dependencies if any. 04
 1) S1: $A = B + C$, S2: $D = 2 * A$
 2) S1: $A = B + C$, S2: $A = A - D$
 (b) Explain with suitable example that dependency is not transitive. 03
 (c) Write parallel program to sum an array, named A, of N numbers using UNIX shared memory programming model. 07
- Q.5** (a) Explain routines for creating, terminating, joining and setting thread attributes for POSIX threads (pthread) 07
 (b) Explain groups and communicators and types of communications in message passing interface 07
OR
- Q.5** (a) What is conditional variable in pthread? Explain routines for waiting and signaling on conditional variable 07
 (b) Write short note on parallel virtual machine 07
