

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER-V • EXAMINATION – WINTER • 2014

Subject Code: 2650005

Date: 05-12-2014

Subject Name: Parallel Programming

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)
 - i. Define “Parallel Processing” **01**
 - ii. Define “Concurrency” **01**
 - iii. What is “cache coherence” issue occur in multiprocessors system? **02**
 - iv. What is “Induction Variable”? **02**
 - v. Define MPI. **01**
 - (b)
 - i. How can semaphore be initialized and deleted? **02**
 - ii. Explain parameters of pthread_create() function. **02**
 - iii. Explain functionality of MPI_Init() function. **03**
- Q.2**
- (a)
 - i. Explain Flynn’s classification of computer architecture. **03**
 - ii. What are the sources of performance loss? Explain any one in detail. **04**
 - (b) List down six Parallel Computers. Explain any one in detail. **07**
- OR**
- (b)
 - i. Justify : “Multi-Core Computers, as an Opportunity” **03**
 - ii. Explain Random access machine (RAM). **04**
- Q.3**
- (a)
 - i. Explain different phases of Generic Compilation Process with diagram. **05**
 - ii. What assumptions are made at the time of development of algorithm for P-RAM? **02**
 - (b) What is array processor? Explain SIMD Computer Organization. **07**
- OR**
- Q.3**
- (a)
 - i. Explain forward dependency using block scheduling. Give an example of forward dependency. **04**
 - ii. What is loop splitting? Explain with code snippet. **03**
 - (b) Explain following process synchronization primitives. **07**
 - i. lock_init(lockid)
 - ii. lock(lockid)
 - iii. unlock(lockid)
- Q.4**
- (a) What is the need of barrier? Explain barriers mechanism with code snippet. **07**
 - (b)
 - i. How can we create shared memory or delete shared memory in multi processing application using code? **05**
 - ii. Define fork() function using code. **02**
- OR**
- Q.4**
- (a) Explain following terminology of PVM **07**
 - 1. Host
 - 2. Virtual Machine
 - 3. Task
 - 4. TID
 - 5. pvmd
 - 6. Message
 - 7. Group
 - (b) Explain the need of mutual exclusion using POSIX thread. **07**

- Q.5 (a)** What is the need of shared memory in parallel programming explain with code snippet. **07**
- (b)** Explain following dependences. **07**
- i. Anti dependence
 - ii. Output dependence
 - iii. Input dependence
- OR**
- Q.5 (a)** Explain architecture of PVM with diagram. **07**
- (b)** Explain collective communication in MPI with help of MPI_Scan(), MPI_Bcast() and MPI_Barrier() functions. **07**
