

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

## GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER-V • EXAMINATION – WINTER • 2014

**Subject Code: 650005**

**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. Explain Control and Resource dependency with example. **02**
    - ii. How can we achieve pipelining within the CPU? **02**
    - iii. What are the familiar variations on Heterogeneous chip design of parallel computer? **01**
    - iv. What is Latency and Throughput? **02**
  - (b)
    - i. What is the need of “backward dependency”? Explain with code snippet. **04**
    - ii. Explain the function MPI\_Gather() with parameters. **03**
- Q.2**
- (a)
    - i. Explain “NUMA” architecture model. **03**
    - ii. Explain crossbar switch interconnection with diagram. **04**
  - (b)
    - i. Give the use of following functions of Dynamic Process Groups. **05**
      - a. pvm\_getinst()
      - b. pvm\_gettid()
      - c. pvm\_gsize()
      - d. pvm\_barrier()
    - ii. What is “InductionVariable”? **02**
- OR**
- (b) How can we create and delete shared memory in parallel processing? Explain with code snippet. **07**
- Q.3**
- (a) Explain following POSIX thread functions with parameter, if any. **07**
    - i. pthread\_self()
    - ii. pthread\_join()
    - iii. pthread\_create()
  - (b) Write a short note on classification of pipeline processors. **07**
- OR**
- Q.3**
- (a) Explain groups and communicators and types of communications in message passing interface. **07**
  - (b) Differentiate following terms: **07**
    - a. Threads vs process.
    - b. Communication vs Computation.
- Q.4**
- (a)
    - i. Explain loop splitting with example. **05**
    - ii. Which process is called as orphan process? Explain with example. **02**
  - (b) What is the need of mutual exclusion in parallel programming? Explain with code snippet. **07**
- OR**
- Q.4**
- (a) What is known as core? List the example of chip multiprocessors explain any one in detail. **07**
  - (b) What is barrier? Explain barriers mechanism with example. **07**
- Q.5**
- (a) Explain architecture of Parallel Virtual Machine. **07**

**(b)** Explain Generic Compilation Process with diagram. **07**

**OR**

**Q.5 (a)** What is array processor? Explain SIMD Computer Organization. **07**

**(b)** i. Explain Flynn's classification of computer architecture. **03**

ii. What are the sources of performance loss? Explain any one in detail. **04**

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