Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**MCA - SEMESTER– V• EXAMINATION – SUMMER - 2016**

**Subject Code:2650005 Date:11/05/2016**

**Subject Name: Parallel Programming (PP)**

**Time:10.30 AM TO 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.**

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|---|---|---|---|
| **Q.1** | **(a)** | 1. List parallel processing technique used in uniprocessor. | **02** |
| | | 2. Explain Control dependency and Resource dependency with example. | **03** |
| | | 3. Define fork() function with code. | **02** |
| | **(b)** | 1. Explain UMA model in brief. | **03** |
| | | 2. Define: Latency and Throughput. | **02** |
| | | 3. What is cache coherence issue in multiprocessors? | **02** |
| **Q.2** | **(a)** | Explain forward dependency using block scheduling. Give an example of forward dependency. | **07** |
| | **(b)** | Write short note on heterogeneous chip design. | **07** |
| | | **OR** | |
| | **(b)** | Explain symmetric multiprocessor architecture with schematic diagram. | **07** |
| **Q.3** | **(a)** | Explain following terms used in PVM.<br>1. Host 2. Virtual machine 3.Task 4. Task-ID 5. PVM-Deamon 6. Message 7. Group | **07** |
| | **(b)** | Explain general model of shared memory programming. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Explain need of mutual exclusion for multiprocessing application with code. | **07** |
| | **(b)** | Explain routines for creating, terminating, joining and setting thread attributes for POSIX threads (pthread). | **07** |
| **Q.4** | **(a)** | What is P-RAM? Explain assumptions and constraints of it. | **07** |
| | **(b)** | What is conditional variable in pthread? Explain routines for waiting and signaling on conditional variable. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | What is barrier? Explain purpose of barrier with appropriate example. | **07** |
| | **(b)** | Explain following methods of Message Passing Interface APIs<br>1. MPI_Comm_Rank()<br>2. MPI_Finalize()<br>3. MPI_Init() | **07** |
| **Q.5** | **(a)** | What is array processor? Explain SIMD Computer Organization. | **07** |
| | **(b)** | Explain the functionalities of following functions with their parameters.<br>semget(), semop() | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Explain following term with example.<br>1. Induction Variable<br>2. Loop Splitting | **07** |
| | **(b)** | Explain following process synchronization primitives.<br>1. lock_init(lockid)<br>2. lock(lockid)<br>3. unlock(lockid) | **07** |

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