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 pipeling 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. a. pvm_getinst() b. pvm_gettid() c. pvm_gsize() d. pvm_barrier()	**05**
		ii.	What is "InducationVariable"?	**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. i. pthread_self() ii. pthread_join() iii. pthread_create()	**07**
	(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: a. Threads vs process. b. Communication vs Computation.	**07**
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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