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 5. pvmd	
			2. Virtual Machine 6. Message	
			3. Task 7. Group	
			4. TID	
	(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. i. Anti dependence ii. Output dependence iii. Input dependence	**07**

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**

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