Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII EXAMINATION – WINTER 2015

Subject Code:180702 Date:04/12 /2015

Subject Name: Parallel Processing

Time: 2:30pm to 5:00pm 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)**	Explain message passing and shared-address-space computers with neat sketches. Differentiate between these two computers.	**07**
	(b)	Draw and explain architecture of Uniform Memory Access (UMA) and Non-Uniform Memory Access (NUMA) shared-address-space computers with applicable caches and memories.	**07**
Q.2	**(a)**	Explain mutual exclusion for shared variable in Pthreads.	**07**
	(b)	Explain scatter and gather communication operation.	**07**
		OR	
	(b)	Enlist and discuss different parallel algorithm models in detail.	**07**
Q.3	**(a)**	Explain Dijkstra's Algorithm for Single-Source Shortest Paths	**07**
	(b)	Discuss Different performance metrics for parallel systems.	**07**
		OR	
Q.3	**(a)**	Explain sending and receiving messages using MPI.	**07**
	(b)	Explain invalidate protocol used for cache coherence in multiprocessor system.	**07**
Q.4	**(a)**	Discuss buffered non-blocking and non-buffered non-blocking send/receive message passing operations with neat sketches.	**07**
	(b)	What is sorting network? Explain bitonic sort.	**07**
		OR	
Q.4	**(a)**	Explain thread creation, termination and cancellation in detail in shared-address-space supported parallel systems.	**07**
	(b)	Define Isoefficiency function and derive equation of it.	**07**
Q.5	**(a)**	Explain various decomposition techniques. Explain data decomposition with suitable example.	**07**
	(b)	Explain odd-even sort in parallel environment and comment on its limitation.	**07**
		OR	
Q.5	**(a)**	Discuss the parallel algorithm for Prim's algorithm and compare its complexity with the sequential algorithm for the same.	**07**
	(b)	Explain multistage network topology.	**07**

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