Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII • EXAMINATION – SUMMER 2014

Subject Code: 180702 Date: 31-05-2014

Subject Name: Parallel Processing

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.**

Q.1	**(a)**	Explain Cache Coherence in Multiprocessor Systems.	**07**
	(b)	What is Data Decomposition? Explain Data Decomposition with proper example.	**07**
Q.2	**(a)**	Explain All-Reduce and Prefix-Sum operation on Hypercube and also write algorithm for it.	**07**
	(b)	List Various Network Topologies. Explain Crossbar and Multistage Networks.	**07**
		OR	
	(b)	Write steps for All-to-All Personalized communication on Mesh and Ring Network.	**07**
Q.3	**(a)**	Explain Different Performance Metrics for Parallel Systems. Explain Speedup in detail.	**07**
	(b)	Write short note on how mutex-locks and condition variable is use for synchronizing shared data in Shared-address-space programming in Pthreads.	**07**
		OR	
Q.3	**(a)**	Explain Recursive Decomposition technique to find minimum number from array. Draw task dependency graph for following data. 4, 9, 2, 6, 1, 7, 8, 11, 5, 3, 2, 12	**07**
	(b)	Explain Blocking Non-Buffered Send/Receive and Blocking Buffered Send/Receive for message passing operation.	**07**
Q.4	**(a)**	Explain Matrix-Vector Multiplication using 2-D Partitioning.	**07**
	(b)	Explain following function with respect to MPI. (1) MPI_Send (2)MPI_Scatter (3) MPI_Gather (4) MPI_Recv	**07**
		OR	
Q.4	**(a)**	Explain thread creation, termination and cancellation in detail in shared-address-space parallel system.	**07**
	(b)	Explain Matrix-Multiplication using DNS Algorithm.	**07**
Q.5	**(a)**	Explain Mapping of Bionic sort to a Hypercube and Mesh.	**07**
	(b)	Explain Parallel formulation of Prim's Algorithm to find MST.	**07**
		OR	
Q.5	**(a)**	Write and Explain Floyd's Algorithm for all-pairs shortest paths with an example.	**07**
	(b)	Write and Explain Algorithm for ODD-EVEN Transposition Sort. Also sort following Data. 1, 3, 8, 2, 9, 4, 6, 5	**07**

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