

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VIII (OLD) EXAMINATION – WINTER 2018

Subject Code: 180702

Date: 15/11/2018

Subject Name: Parallel Processing

Time: 02:30 PM TO 05:00 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)** What is meaning of memory latency? How memory latency can be improved by cache? **07**
- (b)** Explain Mutual Exclusion and Condition Variable with proper example. **07**
- Q.2 (a)** Enlist and explain various PRAM models. **07**
- (b)** Define Decomposition, Granularity, maximum degree of concurrency and average degree of concurrency. With example explain determination of average degree of concurrency with the help of task dependency graph **07**
- OR**
- (b)** Discuss different parallel algorithm models in detail. **07**
- Q.3 (a)** Explain Dijkstra's Algorithm for Single-Source Shortest Paths. **07**
- (b)** Explain following functions of MPI: **07**
MPI_Send (), MPI_Comm_size (), MPI_Comm_rank ().
- OR**
- Q.3 (a)** Explain Bitonic sort with example. **07**
- (b)** Briefly explain the difference between all to all broadcast and all to all personalized communication. With diagram explain all to all broadcast on 3X3 mesh With diagram explain optimal algorithm of all to all personalized communication on three dimensional 8-node hypercube. **07**
- Q.4 (a)** Explain the various collective communication operations provided by MPI. **07**
- (b)** Explain odd-even transposition sort algorithm. **07**
- OR**
- Q.4 (a)** Explain following functions of POSIX Threads: **07**
pthread_create (), pthread_join ().
- (b)** Explain invalidate protocol used for cache coherence in multiprocessor system. **07**
- Q.5 (a)** Briefly explain pthread_create, pthread_join and pthread_exit functions related to thread. Explain attributes associated with threads and mutex. Briefly explain different types of mutex **07**
- (b)** Explain Cannon's Algorithm for Matrix-Matrix Multiplication **07**
- OR**
- Q.5 (a)** Explain bubble sort and its variants. **07**
- (b)** Discuss Prim's algorithm for minimum spanning tree. **07**
