

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VIII • EXAMINATION – WINTER • 2014

Subject Code: 180702

Date: 29-11-2014

Subject Name: Parallel Processing

Time: 02:30 pm - 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) Draw and explain architecture of Uniform Memory Access (UMA) and Non-Uniform Memory Access (NUMA). **07**
(b) Enlist various decomposition techniques. Explain exploratory decomposition with suitable example. **07**
- Q.2** (a) With suitable diagram and example, explain All-to-All Broadcast and All-to-All Reduction. **07**
(b) Enlist and explain in brief, the various PRAM models. **07**
- OR**
- (b) Enlist and discuss different parallel algorithm models in detail. **07**
- Q.3** (a) Explain: Performance metrics for parallel systems. **07**
(b) Discuss buffered non-blocking and non-buffered non-blocking send/receive message passing operations with suitable diagram. **07**
- OR**
- Q.3** (a) What is isoefficiency function? Derive equation of isoefficiency function. **07**
(b) Explain following MPI routines with arguments. **07**
I. MPI_Send II. MPI_Recv III. MPI_Sendrecv
- Q.4** (a) In context to Pthread, Explain normal, recursive and error check mutex. **07**
(b) Explain Cannon's algorithm for matrix multiplication. **07**
- OR**
- Q.4** (a) Explain following functions with respect to Pthreads API. **07**
I. pthread_create() II. pthread_join()
(b) Explain DNS algorithm. **07**
- Q.5** (a) Explain Bitonic sort with example. **07**
(b) Explain Prim's algorithm for minimum spanning tree. **07**
- OR**
- Q.5** (a) Explain Odd-Even Transposition sort Algorithm. **07**
(b) Explain parallel formulations of Dijkstra's algorithm. **07**
