

GUJARAT TECHNOLOGICAL UNIVERSITY**MCA SEM-V Examination- Dec.-2011****Subject code: 650005****Date: 19/12/2011****Subject Name: Parallel Programming (PP)****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) Explain fork(). **03**
(ii) List possible overheads in parallel program. **02**
(iii) Task instance number can have gap in pvm. Justify this statement. **02**
- (b) (i) Explain the importance of non-parallelizable computations as per Amdahl's law. **03**
(ii) What do you mean by ideal speedup, true speedup and superlinear speedup? **04**
- Q.2** (a) (i) Discuss the parameters of semget(). **03**
(ii) Discuss about distributed memory NUMA model. **04**
- (b) (i) How will you use the concept of granularity in parallel programming? **03**
(ii) Explain loop-split mechanism to distribute independent jobs to processes to work in parallel. **04**
- OR**
- (b) (i) Write an advantage of overlapping communication and computation. **03**
(ii) Explain block scheduling technique to distribute independent jobs to processes to work in parallel. **04**
- Q.3** (a) Describe the use of mutual exclusion in parallel program with example. **07**
(b) Assume an array with binary data. Write a program segment to compute histogram of values in a given array. **07**
- OR**
- Q.3** (a) Explain the need of barrier synchronization giving example. **07**
(b) Explain pair wise sum of array elements with example. **07**
- Q.4** (a) Describe various types of scalar data dependency. **07**
(b) Discuss POSIX functions related to condition variable. **07**
- OR**
- Q.4** (a) Define backward dependency. Give an example of backward dependency. **07**
How can you solve it for a given problem to parallelize?
(b) Explain creation of POSIX thread. Give example. **07**
- Q.5** (a) Discuss about PRAM parallel computer model. **07**
(b) Explain gather and reduce functions in MPI. **07**
- OR**
- Q.5** (a) Discuss about CTA parallel computer model. **07**
(b) How can one task send message to another task in pvm? Explain in detail with example. **07**
