Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA- Vth SEMESTER–EXAMINATION –JUNE - 2012

Subject code: 650005 **Date: 14/06/2012**

Subject Name: Parallel Programming (PP)

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)** Write true/false. **03**

(i) In newly created child process, fork() returns -1.

(ii) Efficiency with super-linear speedup is greater than one.

(iii) Work load is balanced when block-scheduling is used.

(b) List any four characteristics of good parallel program. Explain any one in detail. **04**

Q.2 **(a)** (i) Write a function to create nproc processes identified as 1 to nproc. **03**

(ii) Discuss about shared memory UMA model. **04**

(b) (i) What do you mean by L1 and L2 cache? Write main difference between Dual Core and Core Duo with respect to position of L2 cache. **03**

(ii) Write parallel code segment to find sum of elements of an array using self-scheduling mechanism. Do not write functions to create/destroy processes, allocate/use shared memory or semaphores. **04**

OR

(b) (i) Explain shmget() in brief. **03**

(iii) Explain an allocation of n independent jobs to nproc processes using loop-splitting and block scheduling technique. Which technique is better? Why? **04**

Q.3 **(a)** Define DEF and USE sets with respect to data dependency. List various types of scalar data dependency. Explain any two giving examples with the use of DEF and USE. **07**

(b) Write a parallel program segment to compute histogram of vowels used in a string using threads. **07**

OR

Q.3 **(a)** Define forward dependency. Give example. Discuss the ways to get rid of the problem due to this dependency. **07**

(b) Discuss about parallel prefix sum of array elements with example. **07**

Q.4 **(a)** Define backward dependency. Give two examples. Transform given examples to remove the problem due to this dependency. **07**

(b) Discuss POSIX functions related to mutex variable. **07**

OR

Q.4 **(a)** Define contention. Discuss about its problem and solution related to parallel programming. **07**

(b) Explain function pthread_create() with its parameters in detail. Give example. **07**

Q.5	**(a)**	Write a short note on granularity.	**07**
	(b)	Write full form of MPI. Explain the use of functions MPI_Init(), MPI_Comm_size() and MPI_Comm_rank().	**07**

OR

Q.5	**(a)**	Write full form of CTA, a parallel computer model. Draw its architecture and write its properties.	**07**
	(b)	What do you mean by PVM? Draw block diagram to explain PVM architecture. Discuss the role of pvmd.	**07**

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