Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER– V EXAMINATION – WINTER 2015

Subject Code: 650005 **Date:08/12/2015**

Subject Name: Parallel Programming

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 the architecture of PRAM & out of four models (EREW, CREW, ERCW, and CRCW), which model is most powerful and why?	**07**
	(b)	Explain the concept of multithreading and its use in parallel computer architecture?	**07**
Q.2	**(a)**	What is pipeline architecture? Draw the architecture. Write about different possible classifications of pipeline processor?	**07**
	(b)	What is a dependency graph? Explain WAW, RAW and WAR dependencies.	**07**
		OR	
	(b)	Briefly compare "shared memory programming" and "message passing" paradigms on the basis of data sharing and synchronization.	**07**
Q.3	**(a)**	Define array processing. Why are array processors called as SIMD Array Computers? With the help of a Block diagram. Explain the architecture of an SIMD array processor.	**07**
	(b)	What are the sources of performance loss? Discuss different types of overheads associated in the parallel processing.	**07**
		OR	
Q.3	**(a)**	List out the techniques to achieve parallelism in sequential machines. Explain in detail?	**07**
	(b)	What are the similarities and differences between; 1) Vector processing 2) Systolic processing	**07**
Q.4	**(a)**	Explain the Amdahl's law for measuring speed up performance with the help of an example.	**07**
	(b)	Explain following system calls with their functionality and usage in the programming: 1.)semget 2.)shmget 3.)ipcs 4.)shmctl	**07**
		OR	
Q.4	**(a)**	What are the types of operating systems used for parallel processing? How they are different from the normal OS.	**07**
	(b)	Explain following system calls with their functionality and usage in the programming: 1.)semop 2.)shmctl 3.)shmat 4.)semctl	**07**

Q.5 **(a)** Differentiate the dependency in the following loop. Show at least two possible solutions to resolve it. For each solution, write the advantages and drawbacks. **07**

Loop: for (i=0; i<n; i++) x[i] = x[i + 1] + y[i];

(b) Write the Histogram computation algorithm for parallel machines with suitable example. **07**

OR

Q.5 **(a)** What do you mean by program transformation? Explain induction variable. How the induction variable can be removed from the code given below: **07**

```
For (i=0 ;i< 10 ;i++)
{
J=17*i ;
}
```

(b) Write the matrix chain multiplication algorithm for parallel machines with suitable example. **07**

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