

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; **07**
- 1) Vector processing
 - 2) Systolic processing

- 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: **07**
- 1.)semget
 - 2.)shmget
 - 3.)ipcs
 - 4.)shmctl

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: **07**
- 1.)semop
 - 2.)shmctl
 - 3.)shmat
 - 4.)semctl

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**
