IS712

USN	1	M	S							

M S RAMAIAH INSTITUTE OF TECHNOLOGY

(AUTONOMOUS INSTITUTE, AFFILIATED TO VTU)

BANGALORE – 560 054

SEMESTER END EXAMINATIONS –JANUARY 2016

Course & Branch	**: B.E.- Information Science & Engg.**	**Semester**	**: VII**
Subject	**: Parallel Programming**	**Max. Marks**	**: 100**
Subject Code	**: IS712**	**Duration**	**: 3 Hrs**

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1.	a)	Differentiate Parallel computing with Distributed Computing.	C01	(03)
	b)	Write a code for multithreaded solution for Counting 3's. Whether this code produces interleaving of reference to the variable or not? If yes, rewrite the code for the improved one.	C01	(09)
	c)	Describe the logical organization of a BlueGene/L node and its communication networks with a neat diagram.	C01	(08)
2	a)	Write down the rule for parallel prefix sum. Calculate the prefix sum of the following array elements{7,3,15,10,13,18,6,4}	C01	(06)
	b)	Discuss the Heterogeneous Chip design processor.	C01	(06)
	c)	List out the characteristics of CTA model. Explain CTA.	C01	(08)

UNIT-II

3.	a)	Explain the different sources of performance loss.	C02	(08)
	b)	Define speedup. With a diagram, show the super linear speed up of two programs with linear speedup. Explain it.	C02	(06)
	c)	Write a Peril-L code for fixed 26-way parallel solution to alphabetizing. Explain the role of reduce and scan in this code.	C02	(06)
4	(a)	What is meant by data dependence? Explain its types.	C02	(08)
	(b)	Describe the fixed parallelism solution to count 3's.	C02	(06)
	(c)	Using Batcher's sort algorithm, arrange the following numbers{10,40,05,27,26,25,01,15,18,21,06,16,08,28,38,11,03,13,19,31 ,39,33,32,04} with 8 Threads	C02	(06)

UNIT-III

5.	a)	Explain Schwartz algorithm for process – induced tree with a diagram.	C03	(06)
	b)	Illustrate the Schematic of the scan operation. Write a Program for customized scan functions to return the index of the last occurrence of the element in the ith operand position.	C03	(08)
	c)	How to provide a balance between locality and load balance? Explain it.	C03	(06)

	a)	List and explain the different functions used for implementing +/ A.	C03	(05)
	b)	Define work queue. Write a code for computing the expansion factor for the collatz conjecture. What is the expansion factor for a_0=15,16 and 17?	C03	(09)
	c)	Explain overlap regions in parallel computation.	C03	(06)

UNIT-IV

7.	a)	Explain the following POSIX thread function with its syntax i) *Thread creation* ii) Thread termination iii) Fetch a thread's ID iv) Compare two thread IDs for equality	C04	(12)
	b)	What is the use of reduction pragma in openMP? Write a OpenMP program to display the count 3's.	C04	(08)
8.	a)	Define mutual exclusion. Discuss the different POSIX threads routines for acquiring and releasing mutexes.	C04	(08)
	b)	How do you achieve task parallelism in OpenMP? Explain. Write a OpenMP program to add, subtract and multiple two matrices.	C04	(12)

UNIT-V

9	a)	What is meant by MPI? Write a MPI program to send and receive a message.	C05	(10)
	b)	Discuss unified parallel C and Titanium	C05	(10)
10	a)	List and explain collective communication operation function in MPI. Write a MPI program to find the largest element in an array.	C05	(10)
	b)	Explain how GPU implement Graphics support for the graphics pipeline.	C05	(10)

****