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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-1 EXAMINATION- February, 2019

M. Tech II Semester (CSE & IT)

COURSE CODE: 14M1WCI432 MAX. MARKS: 35

COURSE NAME: Parallel Programming Techniques

COURSE CREDITS: 3 MAX. TIME: 120 Minutes

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

1. Describe UMA and NUMA shared memory architectures. (CO1) [4 **marks]**
2. Write an OMP program to multiply two matrices with four threads. How would the processing time be different if the multiplication of the matrices is performed is sequentially? (CO2)**[4 marks]**
3. Write three steps by which Collision CRCW PRAM can be simulated by a Arbitrary CRCW PRAM. (CO3) **[3 marks]**
4. Suppose processors P1-P10 access memory locations 4, 7, 13, 20 as per the following table and try to write values V1-V10. Simulate it through a Collision CRCW PRAM. What are the contents of 4,7,13,20 at the end. (CO4 **[4 marks]**

Processors	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Memory location	7	4	13	13	4	20	4	13	4	7
Value	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10

5. What is the cost of a parallel algorithm, If the algorithm runs in $\log^2 n$ time using n/(logn) processors? (CO5) **[2 marks]**
6. Describe Brent's Scheduling principle. (CO5) **[2 marks]**
7. **(a)**How many number of comparators in an odd even merge sorter with 16 inputs are required? (CO5) **[3 marks]**

   (b) When OEM network is invoked on the two sorted sequences 4, 8, 9, 14 and 3, 7, 10, 11, then write the steps that leads to the solution. (CO5) [**3 Marks**]
8. **(a)** From a queue of people waiting to purchase tickets that would be numbered in the order in which they are issued, Suresh steps out after ensuring that Ramesh and John, who are ahead and behind him respectively, will continue in the queue, and after requesting John to purchase four tickets on his behalf. On his return Suresh finds that Ramesh and John have tickets numbered consecutively in the ranges 27 to 38 and 39 to 49 respectively. Which are the tickets that belong to Suresh? (CO6) **[3 marks]**

   (b) Exactly three of the following are Euler circuits of the same tree. Which is the odd one out? Write complete solution. (CO6) **[3 marks]**

   (c) An Euler circuit of a tree is ``CDCEFGFECABAC''. If this tree rooted at vertex ``A'', then what is the level number of vertex F is, if the root is at level 0. (CO6) **[3 marks]**