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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Seventh Semester, B.E. - Computer Science and Engineering

Semester End Examination; Dec - 2016/Jan - 2017

Multicore Architecture and Parallel Programming

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

UNIT - I

1 a.	Explain the Flynn's taxonomy with the help of a suitable diagram.	10
b.	Program excitation time is made up of 75% CPU time and 25% I/O time. Which is the better enhancement; i) Increasing the CPU speed by 50% ii) Reducing I/O time by half	6
c.	Distinguish between concurrency and parallelism.	4
2 a.	Enlist the different items need to understand of threading for user application.	4
b.	Discuss with a neat diagram, the flow of threads in an execution environment.	8
c.	What is virtualization? Describe Run time and System virtualization with a neat diagram.	8

UNIT - II

3 a.	State the challenges faced managing multiple threads and their communication.	4
b.	Write a C language implementation of the error diffusion algorithm.	10
c.	Name the benefits and risks of using threads in parallel programming.	6
4 a.	Explain flow control-based concepts in parallel computing.	8
b.	Describe the use of a condition variable for the producer consumer problem.	8
c.	Write the various lock types.	4

UNIT - III

5 a.	With a program in C# language, illustrate a simple creation of a thread in the Microsoft **.**NET framework.	10
b.	Giving the prototypes of each, describe the fallowing Pthread APIS: Pthread-create( ), Pthread-detach( ), Pthread-join( ).	10
6 a.	Explain the concept of thread pool with an example in **.**NET.	10
b.	Describe user-level threading package offered by windows called fibers.	10

UNIT - IV

7 a.	State the factors that threaded application performance with open MP is largely depended upon.	7
b.	In open MP, what are the different ways the memory can be declared as private?	6
c.	With a neat diagram, describe task queuing execution model.	7

Contd.....2

8	a.	Discuss the reduction operators and variables initial value in open MP.	8
	b.	Describe the four heavily used open MP library functions.	8
	c.	List the four schedule schemes in open MP.	4

UNIT - V

9	a.	Explain briefly data organization for high performance.	8
	b.	With a neat diagram, describe Itanium architecture.	6
	c.	How do you conserve memory bandwidth and avoiding memory contention in multicore processors?	6
10	a.	Describe Hash table with Fine-grained locking with a neat diagram. List the advantage and disadvantages of the technique.	10
	b.	Explain why too many threads can seriously degrade program performance?	10

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