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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belagavi)
Second Semester, M. Tech - Computer Science and Engineering (MCSE)
Semester End Examination; May / June - 2019
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 Hyper Threading Technology with a block diagram. Also explain the multicore with Hyper Threading technology processor architecture.	10
b.	With a neat figure, discuss the flow of threads in an execution environment.	10
2 a.	Demonstrate Amdhal's law applied to multicore and hyper threaded technology.	8
b.	Explain what happens when a thread is created, with the help of appropriate figure?	6
c.	Distinguish between System Virtualization and Runtime Virtualization.	6

UNIT - II

3 a.	Discuss the four types of problems to be addressed, when multi threading is used in programs.	4
b.	Explain the common parallel programming patterns.	10
c.	Discuss the various Lock types.	6
4 a.	Explain the message passing model with suitable diagram.	6
b.	What is Synchronization? Explain the widely used two types of Synchronization operations.	6
c.	Write the 'C' implementation of error diffusion algorithm.	8

UNIT - III

5 a.	Giving the prototypes of each, describe the following Pthread API'S: i) Pthread_create ( ) ii) Pthread_detach ( ) iii) Pthread_join ( )	10
b.	Explain the concept of thread pool with an example in **.**NET.	10
6 a.	Explain the user level threading package offered by windows called fibers.	10
b.	With a program in C# language, illustrate a simple creation of a thread in the Microsoft .NET framework.	10

UNIT - IV

7 a.	Explain how Open-mp achieves thread synchronization using barrier and no wait?	10
b.	Explain task queuing execution model in Open-mp.	10
8 a.	Explain Debugging. Also provide guidelines for Debugging Open-mp programs.	10
b.	Describe the four most heavily used Open-mp library functions.	6
c.	Discuss the four schedule schemes in Open-mp.	4

UNIT - V

9 a. Explain convoying and priority inversions in parallel programming.   6

  b. Explain non-blocking algorithm.   6

  c. How do you conserve memory bandwidth and avoid memory contention in multicore
     processors?   8

10 a. Explain why too many threads can seriously degrade program performance?   8

  b. Explain the following :

   i) ABA problem   12

   ii) Current IA-32 architecture

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