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

(An Autonomous Institution affiliated to VTU, Belgaum)

Second Semester, M. Tech - Computer Engineering (MCEN)

Semester End Examination; June - 2016

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 need for concurrency is software taking an example of end to end architecture of streaming multimedia content over the internet.	10
	b.	Explain the classification of computer architectures.	10
2	a.	With neat diagrams explain the mapping models of threads to processors.	10
	b.	Define Amdahl's law. What are its limitations?	10

UNIT - II

3	a.	Discuss the five parallel programming patterns.	10
	b.	Explain error diffusion algorithm.	10
4	a.	What is synchronization? Explain any two synchronization primitives.	10
	b.	What are messages? Explain message passing model.	10

UNIT - III

5	a.	Discuss the various Win32 API's for thread creation.	10
	b.	Write a note on thread priority and processor affinity.	10
6	a.	Explain the creation and synchronization of POSIX threads.	10
	b.	Write a note on thread pool and managing threads for Microsft.NET framework.	10

UNIT - IV

7	a.	Discuss the challenges in threading a loop in Open MP.	10
	b.	Explain how Open MP achieves thread synchronization using barrier and No wait?	10
8	a.	Explain the task of queuing execution model.	10
	b.	Why is debugging multithreaded applications a challenge? List out the guidelines for debugging Open MP programs.	10

UNIT - V

9	a.	Write a note on data races and thread safety.	10
	b.	Discuss heavily contended locks with solutions.	10
10	a.	Mention the features of non blocking algorithms.	4
	b.	Discuss how lockless implementation of a linked stack may suffer from ABA problem.	8
	c.	Describe the current IA-32 architecture.	8

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