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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; October - 2022
Multi-core Architecture and Parallel Programming

Time: 3 hrs   *Max. Marks: 100*

<u>*Note:*</u> *I) Answer any **FIVE** full questions, selecting **ONE** full question from each unit.*
*II) Any **THREE** units will have internal choice and remaining **TWO** unit questions are compulsory.*
III) Each unit carries 20 marks.

Q. No.	Questions	Marks	BLs	COs	POs
	UNIT - I	**20**			
1 a.	Discuss in detail about the single, multiprocessor and multi-core architecture.	10	L3	CO1	PO1,2
b.	Discuss multithreading on single core versus multi core platforms.	10	L3	CO1	PO1,2
	UNIT - II	**20**			
2 a.	List out the various forms of decomposition. Explain each in detail.	10	L3	CO2	PO1,2
b.	Discuss with suitable example four synchronization primitives briefly.	10	L3	CO2	PO1,2
	UNIT - III	**20**			
3 a.	Discuss thread synchronization using semaphore in windows operating system.	10	L3	CO3	PO2,3
b.	Discuss atomic operations and thread pools with functions for windows operating system.	10	L3	CO3	PO2,3
	OR				
3 d.	Discuss threading API's of Microsoft **.**net operating system.	10	L3	CO3	PO2,3
e.	Discuss threading API's of POSIX standards.	10	L3	CO3	PO2,3
	UNIT - IV	**20**			
4 a.	What are the challenges involved in threading loop? Explain any four.	10	L2	CO3	PO4,5
b.	What is the need for minimizing threading overhead? Explain with work sharing sections.	10	L3	CO4	PO4,5
	OR				
4 d.	What are the difficulties in debugging in an OpenMp program and explain four OpenMp library functions.	10	L2	CO4	PO4,5
e.	With a suitable diagram, explain the concept of task queuing execution.	10	L2	CO4	PO4,5

UNIT - V   **20**

5 a.	With example, explain data race condition, deadlocks and live locks in programming language.	10	L3	CO5	PO2,3
b.	Explain heavily contended locks and give solutions for heavily contented locks	10	L3	CO5	PO2,3

OR

5 d.	With suitable program and diagram, explain ABA problem.	10	L3	CO5	PO2,3
e.	Explain Itanium architecture in detail.	10	L3	CO5	PO2,3

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