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

(An Autonomous Institution affiliated to VTU, Belagavi)

First Semester, M. Tech - VLSI Design and Embedded System (MECE)

Semester End Examination; April / July - 2021

Multicore Architecture and Programming

Time: 3 hrs *Max. Marks: 100*

Course Outcomes

The Students will be able to:

CO1: To gain knowledge of Multicore architecture, shared memory model of parallel computation, parallel programming concepts and use of OpenMP.

CO2: To obtain insight of ins-and-outs of parallelism, apply parallel patterns and avoiding common pitfalls.

CO3: To be able to analyze and write OpenMP programs for the practical problems and prepare and present a report.

CO4: To be able to analyse Parallel programming problems and come up with improvised solutions through self learning and research.

Note: 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.* ***IV)*** *Missing data, if any, may suitably be assumed.*

Q. No.		UNIT - I	Marks	BLs	COs	POs
1	a.	Explain the Flynn's taxonomy with the help of a suitable diagram.	7	L2	CO1	PO5
	b.	Define Amdahl's law. Explain Amdahl's law as applied to HT technology.	10	L2	CO1	PO5
	c.	Distinguish between runtime virtualization and system virtualization.	3	L4	CO1	PO5
		OR				
1	d.	Discuss with neat figure, the flow of threads in an execution environment.	10	L2	CO2	PO3
	e.	Illustrate and explain different layers of the operating system.	10	L2	CO2	PO3
		UNIT - II				
2	a.	Categorize the common parallel programming patterns.	10	L4	CO2	PO3
	b.	Analyze the method to transform the basic error diffusion algorithm into an approach that is more conductive to a parallel solution.	10	L4	CO3	PO2
		OR				
2	d.	What is synchronization? Explain the widely used two types of synchronization operation.	10	L2	CO2	PO3
	e.	Explain message passing model.	10	L2	CO1	PO5
		UNIT - III				
3	a.	State the way in which memory can be declared as private in OpenMP. Give an example.	10	L2	CO3	PO2
	b.	Describe the four most heavily used OpenMP library functions.	10	L2	CO4	PO5
		OR				

Contd… 2

3 d.	What are the clauses provided by OpenMP standard to accomplish the data copyin and copyout operation?	5	L2	CO3	PO2
e.	List the factors that threaded application performance with OpenMP is largely depended upon.	5	L1	CO3	PO2
f.	Explain four schedules schemes in OpenMP.	10	L2	CO2	PO3
	UNIT - IV				
4 a.	Explain convoying and priority inversion in parallel program.	10	L2	CO4	PO5
b.	How do you conserve memory bandwidth and avoid memory contention in multicore processors?	10	L4	CO2	PO3
	UNIT - V				
5 a.	With the help of neat diagram, explain distributed and shared memory computers.	10	L3	CO1	PO5
b.	Explain Fork-Join programming model supported by OpenMP with diagram.	10	L2	CO1	PO5

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