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VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 6018

M.E. / M.Tech. DEGREE END-SEMESTER EXAMINATIONS – JUNE / JULY 2024

Second Semester

Information Technology

P23IT207 – PARALLEL COMPUTING

(Common to Computer Science and Engineering)

(Regulation 2023)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Why do we need Parallel Computing?	2	K2	CO1
2.	Differentiate between Parallel, Concurrent, and Distributed Computing.	2	K2	CO1
3.	What does it mean for a design to “scale”? Give an example.	2	K3	CO2
4.	What are the performance metrics of Parallel Computing?	2	K2	CO2
5.	Differentiate between SIMD and MIMD.	2	K2	CO3
6.	Explain Multithreaded Latency Hiding.	2	K2	CO3
7.	What is Amdahl’s Law?	2	K2	CO4
8.	Differentiate between software multithreading and hardware multithreading.	2	K3	CO4
9.	What is Instruction pipelining? What's the main difference between dynamic and static pipelines?	2	K3	CO5
10.	What do you understand about ‘Cache’ in microprocessor architecture?	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	i. Distinguish between hardware and software parallelism.	6	K3	CO1
	ii. Explain the challenges in Parallel Programming.	7		
(OR)				
b)	i. List and explain the system attributes affecting the performance of a CPU.	7	K2	CO1
	ii. What are architectural methods to improve the speed of computers?	6		
12. a)	Discuss the PRAM model, and explain the subclasses of the PRAM model in detail.	13	K2	CO2
(OR)				
b)	Discuss the following in detail:			
	i. Overhead and Occupancy in Parallel Computing.	6	K3	CO2
	ii. Parallel Reduction Algorithm.	7		
13. a)	i. What do you understand by Latency Tolerance?	3	K2	CO3
	ii. Explain four latency tolerance approaches.	10		
(OR)				
b)	Discuss the following in detail:			
	i. Microprocessor Architecture Families.	7	K2	CO3
	ii. Non-linear pipeline processors.	6		
14. a)	i. Explain the classification of interconnection networks for parallel processors.	5	K2	CO4
	ii. Discuss the Network Topologies in interconnected networks.	8		
(OR)				
b)	Explain what is a thread and discuss how to maintain the synchronization of concurrent threads with suitable examples.	13	K3	CO4
15. a)	Explain in detail the classification of computing systems according to Flynn's taxonomy.	13	K3	CO5
(OR)				

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|----|-----|---|---|----|-----|
| b) | i. | Explain why Communication Cost is a major overhead in Parallel Computing. | 6 | K3 | CO5 |
| | ii. | Explain an example with a Simplified Cost Model for Communicating Messages. | 7 | | |

PART – C

					(1 x 15 = 15 Marks)
Q.No.		Questions	Marks	KL	CO
16. a)		Explain in detail the Cache Coherence in Multiprocessor Systems with proper examples.	15	K2	CO3
		(OR)			
b)		Discuss the evolution of the different generations of computers. Also, explain the elements of modern computer architecture.	8	K2	CO1
			7		
