

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***UG/PG DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2026****Second Semester****Department of Computer Science and Engineering****PCST2422 - MULTICORE ARCHITECTURE AND PROGRAMMING****Regulations - 2024****Duration: 3 Hrs.****Maximum: 100 Marks****PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

Q.No	Questions	BLT	CO	Marks
1.	What is a vector instruction?	L1	1	2
2.	How does snooping cache coherence maintain consistency in a multiprocessor system?	L2	1	2
3.	What is a multi-core processor? List any two advantages of it.	L1	2	2
4.	Compare deadlock and livelock, highlighting their key differences.	L2	2	2
5.	State the definitions of mutex and spinlock.	L1	3	2
6.	How data race affects the performance of multi processing system.	L2	3	2
7.	How does a message queue facilitate communication between processes?	L2	4	2
8.	How OpenMP can be applied to parallelize a 'Hello World' program.	L2	4	2
9.	Define work-sharing constructs.	L1	5	2
10.	Compare the key features and differences between OpenMP and Pthreads.	L2	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No	Questions	BLT	CO	Marks
11. a	Explain the concept of an interconnection network and its role in parallel systems.	L2	1	16
	Or			
b i	Describe how MIMD systems differ from SIMD systems in terms of processing and functionality.	L2	1	8
ii	Discuss the basic approach to designing a parallel program with an example.	L2	1	8
12. a	Apply signals, messages and pipes to model communication between threads.	L3	2	16
	Or			
b	How do data races affect scalability in parallel programming? Explain how to avoid them.	L3	2	16

13.	a	i	Analyze the producer-consumer problem and explain the synchronization methods used to solve it.	L4	3	8
		ii	Discuss deadlock, livelock, and named pipes, and explain how they impact system operations.	L4	3	8
Or						
	b		Compare SIMD and MIMD in detail, and discuss the performance issues with suitable real-time scenario.	L4	3	16
14.	a		Develop a solution to prevent data races in a program. What tools and methods would you choose?	L5	4	16
	Or					
	b		Design a parallel programming model to handle data and functional parallelism in OpenMP. Evaluate the performance of your model.	L5	4	16
15.	a		Evaluate the different OpenMP directives and discuss how they help improve parallel program performance.	L5	5	16
	Or					
	b		Evaluate different methods of handling loops in parallel operations and discuss their impact on performance and efficiency.	L5	5	16
