

Seat No.:	Q. Paper Code: FTC-A-012			SET	A	
	Fabtech Technical Campus, College of Engineering & Research, Sangola					
	(An Autonomous Institute)					
	Computer Science and Engineering					
	Academic Year: -2025-26, Semester-I					
High Performance Computing(25PCS11173)						
Regular End Semester Examination Winter 2025-26 [Dec./Jan]						
Class:	F. Y. M. Tech.	Day & Date:	Monday 05/01/2026			
Duration:	03 Hrs.	Max. Marks:	60 Marks			
Time:	11:00 AM TO 02:00 PM					
Instructions:						
1) All Questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw a neat diagram wherever necessary. 4) Make suitable assumptions if necessary and state it clearly. 5) Use of non-programmable calculator is allowed.						
Q. No.	Questions			Marks	CO	BL
Q. 1	Attempt any two of the following			12		
1	Describe trends in microprocessor architectures.			6	1	2
2	Explain static vs. dynamic interconnection networks.			6	1	2
3	Demonstrate how the message-passing model can be used to implement parallel prime number generation.			6	1	3
Q. 2	Attempt any two of the following			12		
1	Explain how tree-structured reduction works.			6	2	2
2	Compare scatter vs broadcast with suitable points.			6	2	4
3	Analyze communication overhead in prefix-sum vs reduction for histogram generation.			6	2	4
Q. 3	Attempt any two of the following			12		
1	Describe thread creation and termination in Pthreads.			6	3	2
2	Apply MPI_Send and MPI_Recv to exchange data between two processors.			6	3	3
3	Analyze thread synchronization issues using a shared counter example.			6	3	4

Q. 4	Attempt any two of the following	12		
1	Explain Dijkstra's algorithm step-by-step.	6	4	2
2	Compare odd-even merge network vs bitonic network.	6	4	4
3	Analyze communication overhead in parallel bubble sort.	6	4	4
Q. 5	Attempt any two of the following	12		
1	Describe roles of CPU and GPU in heterogeneous systems.	6	5	2
2	Describe OpenCL execution environment.	6	5	2
3	Analyze performance bottlenecks in a parallel sorting application.	6	5	4