Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – MAY/ JUNE 2025

Date: 02-06-2025 **Time:** 01:00 pm – 04:00 pm

School: SOCSE	**Program:** B. Tech-CSI	
Course Code: CSE3079	**Course Name:** Parallel Computing	
Semester: IV	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	CO1	CO2	CO3	CO4	CO5
Marks	26	26	24	24	-

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	Define concurrent computing.	**2 Marks**	**L1**	**CO1**
2.	List the applications of parallel computing.	**2 Marks**	**L1**	**CO1**
3.	Define the term uniprocessor system.	**2 Marks**	**L1**	**CO1**
4.	What is meant by prefetching?	**2 Marks**	**L2**	**CO2**
5.	What is the use of multi stage network?	**2 Marks**	**L1**	**CO2**
6.	Draw the diagram of fat tree.	**2 Marks**	**L2**	**CO2**
7.	Classify the types of parallel algorithm models.	**2 Marks**	**L2**	**CO3**
8.	What is the use of speculative decomposition?	**2 Marks**	**L1**	**CO3**
9.	Expand OMP and MPI.	**2 Marks**	**L2**	**CO4**
10.	What is the use of distro_Array?	**2 Marks**	**L1**	**CO4**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	Illustrate the parallel processing mechanism with a diagram.	**20 Marks**	**L3**	**CO1**
		Or			
12.	**a.**	Demonstrate the uniprocessor architecture with a diagram and also explain super scalar execution with proper steps	**20 Marks**	**L3**	**CO1**

13.	**a.**	Demonstrate One-to-all broadcast and all-to-one reduction using i) Mesh topology ii) Ring topology	**20 Marks**	**L3**	**CO2**
		Or			
14.	**a.**	Sketch the concept of granularity for adding 16 numbers.	**10 Marks**	**L3**	**CO2**
	b.	Interpret the one to all broadcast and all to one reduction using hypercube topology	**10 Marks**	**L3**	**CO2**

15.	**a.**	Solve the given problem using Recursive Decomposition technique (i). Find the Smallest of given Number [5 Marks] (ii). Sort the given list [5 Marks]	**10 Marks**	**L3**	**CO3**

15	12	11	1	10	6	8	33	7	4	19	2

	b.	Illustrate Data Decomposition [Database Transactions] with example. Also Explain 15 puzzle solving problem with example.	**10 Marks**	**L3**	**CO3**
		Or			
16.	**a.**	Illustrate any 5 different types of parallel algorithm models with diagrams.	**10 Marks**	**L3**	**CO3**
	b.	Explain Data Decomposition [Matrix Operations] with example.	**10 Marks**	**L3**	**CO3**

17.	**a.**	Develop a program to find the smallest among N numbers using OpenMP.	**10 Marks**	**L3**	**CO4**
	b.	Develop a MPI program to scatter data {39,45,67,72} with 4 processors.	**10 Marks**	**L3**	**CO4**
		Or			
18.	**a.**	Develop a program to find the sum of 100 natural numbers using OpenMP.	**10 Marks**	**L3**	**CO4**
	b.	Develop a program to process 1 to send out a message containing the integer 42 to process 2 using send () and receive () primitives using MPI.	**10 Marks**	**L3**	**CO4**