

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII EXAMINATION – SUMMER 2025

Subject Code:3170721

Date:27-05-2025

Subject Name:Parallel and Distributed Computing

Time:02:30 PM TO 05:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

	MARKS
Q.1 (a) What are the potential benefits of parallel computing?	03
(b) Explain Scope and issues of parallel and distributed computing.	04
(c) How does Flynn's Taxonomy classify parallel architectures?	07
Q.2 (a) What are the types of Decomposition techniques?	03
(b) Explain Non-Uniform Memory Access (NUMA).	04
(c) Draw and explain Systolic architecture.	07
OR	
(c) Draw and explain Dataflow architecture.	07
Q.3 (a) What is load balancing in parallel computing?	03
(b) How does the Map and Reduce pattern work?	04
(c) Discuss in detail the various performance metrics in parallel computing.	07
OR	
Q.3 (a) Differentiate between synchronous and asynchronous Communication.	03
(b) Difference between Shared Memory Model and Message Passing Model.	04
(c) How Scalability and cache coherence work in multiprocessor systems.	07
Q.4 (a) What is a Distributed System, and why is it important?	03
(b) How can atomicity be achieved in a distributed system?	04
(c) Explain divide and conquer algorithm with suitable example.	07
OR	
Q.4 (a) Define terms: Scheduling and Contention.	03
(b) Explain various types of Distributed System Models.	04
(c) Explain Pipeline Architecture.	07
Q.5 (a) What are POSIX threads	03
(b) Explain difference between CUDA and Open MP.	04
(c) Draw and explain Multi processor architecture.	07
OR	
Q.5 (a) Explain Difference between Thread and Process.	03
(b) What is the role of pthread_create() and pthread_kill() functions in POSIX threads,	04
(c) Explain Apache Hadoop (DFS).	07
