

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VII EXAMINATION – WINTER 2025****Subject Code:3170721****Date:01-12-2025****Subject Name:Parallel and Distributed Computing****Time:10:30 AM TO 01:00 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) Write the differences between sequential computing and parallel computing.	03
	(b) Define the term : parallel processing, and also write various applications of parallel processing.	04
	(c) Elaborate Flynn's classification based on instruction stream and data stream.	07
Q.2	(a) Enlist issues and challenges in parallel computing.	03
	(b) What is Uniform Memory Access (UMA)? How it differs from Non-Uniform Memory Access (NUMA)?	04
	(c) Write a detailed note on array processors.	07
	OR	
	(c) Write a detailed note on pipelined computers.	07
Q.3	(a) Discuss systolic architecture with neat diagram.	03
	(b) Write characteristics of tasks, based on task generation and task size.	04
	(c) Discuss various performance metrics in parallel computing in detail.	07
	OR	
Q.3	(a) Explain dataflow architecture in brief with neat diagram.	03
	(b) Write a brief note on load balancing.	04
	(c) Elaborate various parallel algorithm models.	07
Q.4	(a) List down design issues of distributed computing.	03
	(b) Explain consistency and atomicity in brief.	04
	(c) Enlist various distributed systems and explain any one in detail.	07
	OR	
Q.4	(a) State the differences between synchronous and asynchronous communication.	03
	(b) Write advantages and disadvantages of distributed computing.	04
	(c) How scalability and cache coherence work in multiprocessor systems?	07
Q.5	(a) Discuss divide and conquer strategy in parallel processing in brief.	03
	(b) List and explain the different types of communication paradigms used within distributed systems.	04
	(c) Draw and explain Apache Hadoop Architecture.	07

OR

- Q.5** (a) Write the differences between parallel systems and distributed systems. **03**
- (b) What is CUDA? Explain in brief. **04**
- (c) Explain pthread_t, pthread_create, pthread_kill, pthread_exit APIs of POSIX thread library. **07**
