

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2021****Subject Code:3170721****Date:29/12/2021****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.

		<b>MARKS</b>
<b>Q.1</b>	(a) Explain advantages and disadvantages of parallel processing.	<b>03</b>
	(b) Explain SIMD	<b>04</b>
	(c) Classify parallel computers based on Flynn's Taxonomy.	<b>07</b>
<b>Q.2</b>	(a) Explain Contention in details.	<b>03</b>
	(b) Write a short note on Thread V/s Process.	<b>04</b>
	(c) Explain Pipeline architecture with diagram.	<b>07</b>
	<b>OR</b>	
	(c) Draw and explain Systolic architecture.	<b>07</b>
<b>Q.3</b>	(a) Difference between Shared Memory vs. Distributed Memory.	<b>03</b>
	(b) Explain Non-Uniform Memory Access (NUMA).	<b>04</b>
	(c) Describe Symmetric multiprocessing (SMP) and Vector processing with example.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) Explain Merge sort.	<b>03</b>
	(b) Write a short note on Parallel graph Algorithms.	<b>04</b>
	(c) Explain divide and conquer algorithm with suitable example.	<b>07</b>
<b>Q.4</b>	(a) List down design issues of distributed computing.	<b>03</b>
	(b) What are the major disadvantages of Distributed Computing?	<b>04</b>
	(c) Make a list of various Distributed systems and explain any one in details.	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	(a) What is the difference between synchronous and asynchronous Communication?	<b>03</b>
	(b) Explain following terms: Consistency and Atomicity.	<b>04</b>
	(c) Draw and explain shared memory architecture.	<b>07</b>
<b>Q.5</b>	(a) Explain client server and peer-to-peer communication.	<b>03</b>
	(b) Explain in details: POSIX Threads.	<b>04</b>
	(c) How Scalability and cache coherence work in multiprocessor systems	<b>07</b>
	<b>OR</b>	
<b>Q.5</b>	(a) What is CUDA? Explain in details.	<b>03</b>
	(b) List and explain the different types of communication paradigms used within distributed systems.	<b>04</b>
	(c) Explain pthread_t, Pthread_create, pthread_kill, pthread_exit APIs of POSIX thread library.	<b>07</b>

\*\*\*\*\*

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2022****Subject Code:3170721****Date:10/06/2022****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**

- |            |  |           |
|------------|--|-----------|
| <b>Q.1</b> | (a) What are the Goals of parallelism?   | <b>03</b> |
|            | (b) Explain Scope and issues of parallel and distributed computing.                                  | <b>04</b> |
|            | (c) What is Parallel Computing? Explain Pipeline Architecture.                                       | <b>07</b> |
| <b>Q.2</b> | (a) Differentiate between UMA and NUMA.  | <b>03</b> |
|            | (b) How Pipeline architecture is different from Array processor architecture?                        | <b>04</b> |
|            | (c) Classify the parallel computers based on Flynn's Taxonomy.                                       | <b>07</b> |
|            | <b>OR</b>  |           |
|            | (c) Draw and explain Multi processor architecture.   | <b>07</b> |
| <b>Q.3</b> | (a) Define the terms: scheduling and contention.   | <b>03</b> |
|            | (b) Explain load balancing with suitable example.  | <b>04</b> |
|            | (c) Draw and explain Systolic architecture.  | <b>07</b> |
|            | <b>OR</b>  |           |
| <b>Q.3</b> | (a) Difference between Shared Memory and Distributed Memory.   | <b>03</b> |
|            | (b) Write a short note on Parallel graph Algorithms.   | <b>04</b> |
|            | (c) Explain divide and conquer algorithm with suitable example.                                      | <b>07</b> |
| <b>Q.4</b> | (a) Explain client server and peer-to-peer communication.  | <b>03</b> |
|            | (b) Discuss the merits and demerits of Distributed Computing.  | <b>04</b> |
|            | (c) Discuss in detail the various performance metrics in parallel computing.                         | <b>07</b> |
|            | <b>OR</b>  |           |
| <b>Q.4</b> | (a) Differentiate between synchronous and asynchronous Communication.                                | <b>03</b> |
|            | (b) List and explain the different types of communication paradigms used within distributed systems. | <b>04</b> |
|            | (c) How Scalability and cache coherence work in multiprocessor systems?                              | <b>07</b> |
| <b>Q.5</b> | (a) Define the following terms: Consistency, Consensus, and Atomicity.                               | <b>03</b> |
|            | (b) Write a short note on Apache Hadoop.   | <b>04</b> |
|            | (c) Explain pthread_t, Pthread_create, pthread_kill, pthread_exit APIs of POSIX thread library.      | <b>07</b> |
|            | <b>OR</b>  |           |
| <b>Q.5</b> | (a) What is the difference between CUDA and OpenMP?  | <b>03</b> |
|            | (b) Explain design issues and challenges in distributed systems.                                     | <b>04</b> |
|            | (c) Draw and explain shared memory architecture.   | <b>07</b> |

\*\*\*\*\*