Subject Code: MTCS201

PAPER ID-411360

Roll No: | | | | | | | | | | | | | |

MTECH
(SEM II) THEORY EXAMINATION 2023-24
MULTI CORE ARCHITECTURE AND PROGRAMMING MULTI CORE ARCHITECTURE AND PROGRAMMING

TIME: 3 HRS **M.MARKS: 70**

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a.	Explain POSIX Threads.
b.	Discuss the motivation for concurrency in software.
c.	How Thread Synchronization takes place?
d.	Explain the term Deadlock.
e.	Name some common Parallel Programming Problems?
f.	Discuss how threads overhead can be minimized.
g.	Define Live Locks.

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a.	Explain Amdahl's Law. Also discuss its performance criteria and its limitations in parallel computing
b.	What are semaphores? What are its types? Explain with the help of an example.
c.	Illustrate the term Error Diffusion. Also Discuss Error diffusion algorithm using Floyd Steinberg error weights.
d.	Write short note on shared memory programming with open MP.
e.	Discuss Current IA-32 Architecture. Also state the methods to avoid pipeline stalls on IA-32.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

a.	Illustrate Flynn's Taxonomy for Parallel Computing
b.	Explain in detail about the synchronization primitives in parallel program challenges

4. Attempt any *one* part of the following: 7 x 1 = 7

a.	Illustrate how threads are created and how they are managed.
b.	Define the decomposition. Also Discuss its various types.

5. Attempt any *one* part of the following: 7 x 1 = 7

a.	Compare and contrast Mutual Exclusion(mutex) and locks.
b.	Explain the threading API's for Microsoft .NET Framework.

6. Attempt any *one* part of the following: 7 x 1 = 7

a.	Write a short note on: i. OpenMP Library Functions. ii. OpenMP Environment Variables.
b.	Explain how Loop Scheduling and Portioning takes place.

7. Attempt any *one* part of the following: 7 x 1 = 7

a.	Explain ABA problem in multicore programming with suitable example. Also give solution to ABA problem.
b.	Explain Heavily Contended Locks. Also discuss the solutions for Heavily Contended Locks.