Printed Page:- 02 **Subject Code:- AMTCSE0201**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.Tech

SEM: II - THEORY EXAMINATION (2023 - 2024)

Subject: High Performance Computing

Time: 3 Hours **Max. Marks: 70**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* ***three Sections -A, B, & C.*** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION A 15

1. Attempt all parts:-

1-a. The computer architecture aimed at reducing the time of execution of instructions is ... (CO1) 1

(a) RISC
(b) CISC
(c) ISA
(d) IANA

1-b. A parallel algorithm is evaluated by its runtime in function of ... (CO2) 1

(a) the input size
(b) the number of processors
(c) the communication parameters
(d) All of these

1-c. The main advantage of __ is that its storage requirement is linear in the depth of the state space being searched. (CO3) 1

(a) BFS
(b) DFS
(c) BFS and DFS
(d) None of above

1-d. In task dependency graph longest directed path between any pair of start and finish node is called as ..... (CO4) 1

(a) total work
(b) critical path
(c) task path
(d) task length

1-e. The length of the longest path in a task dependency graph is called_ (CO5) 1

(a) the critical path length
(b) the critical data length
(c) the critical bit length
(d) None of Above

2. Attempt all parts:-

2.a.	Define the space complexity? (CO1)	2
2.b.	State the asymmetric multi processor? (CO2)	2
2.c.	Describe the parallel processing? (CO3)	2
2.d.	Define the process synchronization? What is the need of process synchronization? (CO4)	2
2.e.	Write the different types of performance limitations? (CO5)	2

SECTION B **20**

3. Answer any five of the following:-

3-a.	Discuss the characteristics of High Computing Performance? (CO1)	4
3-b.	Explain the Implicit Parallelism in parallel processing? (CO1)	4
3-c.	Explain the cache-coherence protocols? (CO2)	4
3-d.	Distinguish between the vector register and scalar register? (CO2)	4
3.e.	Explain the flynn's classification in detail? (CO3)	4
3.f.	Explain the decomposition techniques for achieving concurrency. (CO4)	4
3.g.	Discuss how we can measure the performance? Write the approaches of measuring performance. (CO5)	4

SECTION C **35**

4. Answer any one of the following:-

4-a.	Describe the challenges in High performance computing. (CO1)	7
4-b.	Differentiate between multiprogramming and Multitasking with example? (CO1)	7

5. Answer any one of the following:-

5-a.	Distinguish between CISC and RISC? (CO2)	7
5-b.	Discuss the significance of CPU cores in computer organization and performance? (CO2)	7

6. Answer any one of the following:-

6-a.	Explain parallel synchronization mechanism in multiprocessor. (CO3)	7
6-b.	Briefly discuss the application of parallel processing in various fields. (CO3)	7

7. Answer any one of the following:-

7-a.	Describe the parallel programming with example. (CO4)	7
7-b.	Explain multi-core processors. Discuss different types of multi-core processors? (CO4)	7

8. Answer any one of the following:-

8-a.	Explain non-buffered blocking message passing operation. (CO5)	7
8-b.	Explain the steps to avoid a deadlock in MPI. (CO5)	7