



QP CODE: 25050816



25050816

Reg No :

Name :

MSc DEGREE (CSS) EXAMINATION DECEMBER 2025

First Semester

M Sc Artificial Intelligence

Core Courses - AI010101 - COMPUTER ARCHITECTURE AND PARALLEL PROGRAMMING

2020 Admission Onwards

02D84233

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. Explain any one applications of parallel computing.
2. Explain Completely-Connected Network and Star-Connected Network.
3. Define different decomposition technique.
4. What is Master-Slave Model?
5. Differentiate between one-to-all broadcast and all-to-one reduction.
6. Briefly describe all to all broadcast and all to all reduction.
7. Explain an algorithm for adding n numbers cost-optimally.
8. What is minimum cost -optimal execution time?
9. Explain logical model of CUDA architecture.
10. Explain the importance of synchronization.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. Explain how shared bus bandwidth can be reduced using caches.
12. What is packet routing ? Also find its communication time.
13. Explain task dependency graph with an example.
14. Explain different characteristics of tasks.





15. Explain prefix sum operation on an eight-node hypercube.
16. Explain sources of overhead in parallel system.
17. What is isoefficiency function? Explain its significance.
18. Discuss constant memory in CUDA architecture.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Explain Bus-based, multi-stage and crossbar network topologies.
20. Explain interaction overheads in parallel program and different technique to Minimize Interaction Overheads.
21. Explain circular shift in a hypercube and square mesh. Also evaluate its communication time.
22. Explain memory model in CUDA.

(2×5=10 weightage)

