23003362

QP CODE: 23003362

Reg No : .....

Name : .....

M Sc DEGREE (CSS) EXAMINATION, APRIL 2023

First Semester

M.Sc. Artificial Intelligence

CORE - AI010101 - COMPUTER ARCHITECTURE AND PARALLEL PROGRAMMING

2019 ADMISSION ONWARDS

AC83570D

Time: 3 Hours Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Explain Impact of Memory Bandwidth.
2. Explain deadlock condition in a cut -through routing.
3. With the help of Task-dependency graph define critical path length.
4. Explain the significance of task sizes.
5. Explain all to all personalized communication with an example.
6. Explain how the speed of all-reduce communication can be improved.
7. Define cost of parallel system.
8. What is minimum execution time for adding n numbers.
9. What are the advantages of CUDA?
10. Discuss global memory in CUDA architecture.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Differentiate between message passing and shared address space platforms.
12. What is crossbar network?
13. Write a brief note on Exploratory Decomposition.
14. Discuss Data Parallel Model and Task Graph Model.
15. Differentiate prefix sum operation and scatter and gather operation.
16. Discuss various schemes for mapping computation onto processing elements.
17. Describe a parallel formulation of Matrix-Vector multiplication using 1-D block partitioning.
18. Explain the application of CUDA.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Explain in detail different mechanism used by the processors to support parallelism.
20. Explain interaction overheads in parallel program and different technique to Minimize Interaction Overheads.
21. Explain the procedures and communication times for all-to-all broadcast of m-word messages on p nodes for the linear array and the mesh architectures.
22. Explain the basic programming model used by CUDA?

(2×5=10 weightage)