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QP CODE: 22001701

Reg No : .....

Name : .....

**M Sc DEGREE (CSS) EXAMINATION, JULY 2022**

**First Semester**

M.Sc. Artificial Intelligence

**CORE - AI010101 - COMPUTER ARCHITECTURE AND PARALLEL PROGRAMMING**

2020 ADMISSION ONWARDS

2FFBC522

Time: 3 Hours

Weightage: 30

**Part A (Short Answer Questions)**

Answer any **eight** questions.

Weight **1** each.

1. What is bandwidth and latency of memory?
2. What is Bus-based Network?
3. Explain how volume of data exchanged in parallel program can be minimized.
4. What is Task Graph Model?
5. Explain prefix sum operation on an eight-node hypercube.
6. List the merits and demerits of All-Port communication.
7. Define a)overhead function b)Speedup
8. Define lower bound on isoefficiency function.
9. Explain the memory hierarchy in 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. What is PRAM Model? What are the subclasses of PRAM?





12. Briefly explain Cut-through routing.
13. Explain task dependency graph with an example.
14. Explain different schemes for dynamic mapping.
15. Explain all-to-all broadcast and reduction on a ring and find the communication time.
16. Explain the significance of various mapping schemes.
17. Explain DNS algorithm for matrix-matrix multiplication.
18. Explain physical model of CUDA architecture

(6×2=12 weightage)

### **Part C (Essay Type Questions)**

*Answer any **two** questions.*

*Weight 5 each.*

19. Discuss the application and arguments in favour of parallel computing.
20. Explain different decomposition technique.
21. Explain the procedures and communication times for one-to-all broadcast of m-word messages on p nodes for the hypercube and the mesh architectures.
22. Explain memory model in CUDA.

(2×5=10 weightage)

