

**MAY 2022 - ENDSEM EXAM**  
**FINAL YEAR B.TECH. (COMPUTER ENGINEERING)**  
**(SEMESTER - II)**  
**COURSE NAME: PROFESSIONAL ELECTIVE- IV**  
**[HIGH PERFORMANCE COMPUTING]**  
**COURSE CODE: CSUA40181C**  
**(PATTERN 2018)**

Time: [1 Hr]

Max. Marks: [30]

**SOLUTION**

- Q1a Explanation on minimum & cost optimal execution time of parallel program
- Q1b Row wise 1-D partitioning explanation with example matrix-vector multiplication?
- Q2 a Performance Metrics for parallel Systems [1. Execution Time, 2. Total Parallel Overhead, 3. Speedup, 4. Efficiency, 5. Cost ]
- Q2 b Explanation of 2-D partitioning with example
- Q3 a Solution of the problem using bitonic sort: 3,5,8,9,10,12,14,20,95,90,60,40,35,23,18,0
- Q3 b Comparison of an sequential and parallel Merge sort [4 marks]. Give the complexity for the same
- Q4a Explanation on use of increasing and decreasing comparators used in Sorting Networks
- Q4b communication strategies for parallel BFS
- Q5 a CPU and GPU comparison with diagram
- Q5 b a CUDA program that copies the array from Host to device, multiply 50 in each array element, copy the result from device to host and print the elements. Steps to run the code
- Q6 a Memory hierarchy in CUDA
- Q6 b CUDA program to add two arrays