

Total No. of Questions: [03]

Total No. of Printed Pages: [01]

PRN	
-----	--

PAPER CODE	V482-231C (ESE)
------------	-----------------

**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]

**Instructions to candidates:**

- 1) Answer Q.1 OR Q.2, Q.3 OR Q.4, Q.5 OR Q.6.
- 2) Figures to the right indicate full marks.
- 3) Use of scientific calculator is allowed.
- 4) Use suitable data where ever required.

Q.1 a) Discuss minimum & cost optimal execution time? [4]

b) Explain the cannons algorithm and illustrate the communication steps in Cannon's algorithm on 16 processes? [6]

**OR**

Q.2 a) As a HPC student, which metrics you will use to evaluate the performance of any parallel code? [4]

b) Demonstrate 2-D partitioning with example? [6]

Q.3 a) Solve the problem: sort the following elements using Bitonic Sort.

3, 5, 8, 9, 10, 12, 14, 20, 95, 90, 60, 40, 35, 23, 18, 0 [4]

b) Compare an algorithm for sequential and parallel Merge sort. Analyze the complexity for the same? [6]

**OR**

Q.4 a) Demonstrate how increasing and decreasing comparators are used in Sorting Networks? [4]

b) Explain communication strategies for parallel BFS? [6]

Q.5 a) Compare CPU and GPU with diagram? [4]

b) Write 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. Also show steps to run the code? [6]

**OR**

Q.6 a) Explain memory hierarchy in CUDA? [4]

b) Write a CUDA program to add two arrays? [6]