



Department of CSE Data Science

UNIT TEST – II

Academic Year 2023-24

Class: TEDS Semester: VI Subject: CSDLO6011 High Performance Computing

Date: 19th April 2024 Time: 2:00 to 3:30pm Max marks: 40

Note the following instructions

1. All questions are mandatory (Q.1, Q.2, Q.3)
2. Draw neat diagrams wherever necessary.
3. Write everything in Black ink (no pencil) only.
4. Assume data, if missing, with justification.

Q. N.	Questions	MARKS	CO	Blooms Taxonomy Level	PO2
Q.1.	Attempt any two				
1	Sketch and Explain OpenCL Device Architecture Diagram.	[5]	CO6	L2	
2	Draw and Explain OpenCL Platform Model.	[5]	CO6	L2	
3	List and Explain any five classes of OpenCL.	[5]	CO6	L2	
4	Sketch and Explain OpenCL Memory Model.	[5]	CO6	L2	
Q.2.	Attempt any two				
1	Develop an MPI program for addition of two arrays.	[10]	CO5	L3	PO1, PO12
2	Develop an MPI program for sum of n natural numbers.	[10]	CO5	L3	PO1, PO12
3	Develop an MPI program for calculating the factorial of a number.	[10]	CO5	L3	PO1,

					PO12
Q.3.	Attempt any one				
1	State and Explain Amdahl's Law. Suppose a serial program reads n data from a file, performs some computation and then writes n data back out to another file. The I/O time is measured and found to be $4500+n$ sec. If the computation portion takes $n^2/200$ μ sec. Apply Amdahl's law to calculate the maximum speed up we can expect when $n=10,000$ and N processors are used.	[10]	CO4	L3	PO1, PO12
2	State and Explain Gustafson's Law. A parallel program takes 134 seconds to run on 32 processors. The total time spent in the sequential part of the program was 12 seconds. Apply Gustafson's law to calculate the scaled speedup.	[10]	CO4	L3	PO1, PO12

***** All The Best *****