Register number _____

SRM Institute of Science and Technology
College of Engineering and Technology
School of Computing
SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu
Academic Year: 2023-24 (EVEN)
B.Tech-Computer Science & Engineering **SET – D. – Answer Key**

Test: CLA-T3 **Date: 03.05.2024**
Course Code & Title: 18CSE419T & GPU Programming **Duration: 2 periods**
Year & Sem: III Year /VI Sem **Max. Marks: 50**

Course articulation matrix:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO-1	3														3
CO-2		3	2												3
CO-3		3	3												3
CO-4		3	3												3
CO-5			3	1									2		3

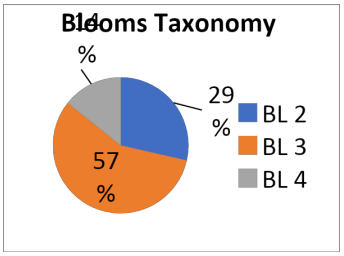
Part – A(1*10=10 Marks)
Answer All the Questions

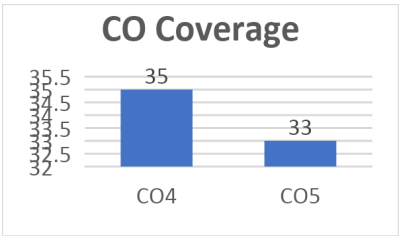
Q. No	Questions	Marks	BL	CO	PO	PI Code
1	Which directive is used to parallelize the iterations of the next loop to run across the parallel gangs? a) Parallel **b) Loop** c) Kernel d) gang	1	1	CO 4	2	**2.2.1**
2	The wait clause in #pragma acc wait(n) will a) pause the program until all queues have completed b) pause the program until all synchronous operations are completed **c) pause the program until all operations in queue n have completed** d) pause the program until all asynchronous operations are completed	1	1	CO 4	2	**2.2.1**
3	Which clause of OpenACC will execute host code and device code simultaneously? a) Parallel b) Kernel c) WAIT **d) ASYNC**	1	1	CO 4	2	**2.2.1**
4	Scalars are _____ when used in a parallel region and _____ when used in a kernel region. a) Private, firstprivate b) Firstprivate, private **c) Public, private** d) Private,public	1	1	CO 4	2	**2.2.1**
5	All data clauses usable on a _____ directive can be used on a parallel and kernels as well. a) Auto clause **b) Data directive** c) Kernel directive d) Parallel directive	1	1	CO 4	2	**2.2.1**

Register number _____

6	An unstructured data directive a) Can be within a single function only b) Cannot have explicit start/end point **c) Can be multiple starting/ending point** d) Cannot have multiple starting /ending point	1	1	CO 5	3	**3.2.1**
7	The notion of independent clause is a) Independent loop execution **b) Parallelizing the loop** c) Non parallelizing the loop d) Compiler execution	1	1	CO 5	3	**3.2.1**
8	When parallelizing our loops the highest level of parallelism is **a) Gang level parallelism** b) Worker level parallelism c) Vector level parallelism d) warp level parallelism	1	1	CO 5	3	**3.2.1**
9	Which one is not a limitation of managed memory in OpenACC? **a) Can transfer data asynchronously** b) Memory allocation takes longer with managed memory c) Able to get better performance by manually handling data transfers d) Only available from PGI on NVIDIA GPUs	1	1	CO 5	3	**3.2.1**
10	Which of the following is an unstructured data directive? a) Data directive **b) Enter data directive** c) Kernel directive d) Exit parallel directive	1	1	CO 5	3	**3.2.1**
	Part – B (4*4=16 marks) **Answer any four Questions**					
Q. No	**Question**	**Marks**	**BL**	**CO**	**PO**	**PI Code**
11	Compare and contrast parallel and kernel directives in OpenACC	4	2	CO 4	2 & 3	**2.2.1**
12	State the purpose of explicit data regions in OpenACC.	4	3	CO 5	3	**2.2.1**
13	Write an OpenACC program for matrix multiplication.	4	3	CO 4	2 & 3	**2.2.1**
14	Illustrate how data synchronization is handled between host and device.	4	3	CO 5	3	**2.2.1**
15	Describe OpenACC memory model.	4	3	CO 4	3	**2.2.1**
	Part – C (2*12=24 marks) **Answer any Two Questions**					
16	With an appropriate code segment illustrate how collapse clause is used to combine multiple parallel loop into a single loop.(6) How auto clause and independent clause are used to implement parallelism in OpenACC?(6)	12	3	CO 4	3	**2.2.1**
17	List out the clauses used for loop optimization in OpenACC and describe its functions.(6) What are private and firstprivate variables in OpenACC? Illustrate with a code snippet(6)	12	3	CO 4 & CO 5	2 & 3	**2.2.1**
18	Apply gang, vector and worker level parallelism to parallelize the loop in order to optimize it.(12)	12	3	CO 5	2 &3	**2.2.1**

Register number _____





Approved by Audit Professor/ Course Coordinator