Code No: **R164205A** **R16** **Set No. 1**

IV B.Tech II Semester Regular/Supplementary Examinations, June - 2022

CONCURRENT AND PARALLEL PROGRAMMING

(Common to Computer Science and Engineering and Information Technology)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1.	a)	Define Concurrent Programming	[2]
	b)	Define Livelock	[2]
	c)	How searhcing is different from traversal?	[2]
	d)	Define distributed shared memory	[2]
	e)	Give the expansion of CUDA.	[3]
	f)	What are the command queues in open CL execution model	[3]

PART–B *(4x14 = 56 Marks)*

2.	a)	Explain the concept of Race condition with a synchronization problem	[7]
	b)	Compare and contrast concurrent programming with sequential programming.	[7]
3.	a)	Describe the role of mutex and semaphore in IPC.	[7]
	b)	Discuss in brief about Bankers algorithm with an example	[7]
4.	a)	Define sorting. Explain in brief about Odd even Transposition sorting	[7]
	b)	Explain about Parallel merge sorting in detail	[7]
5.	a)	Explain about shared memory and Message Passing System in detail	[7]
	b)	Enlist the advantages and disadvantages of distributed shared memory?	[7]
6.	a)	Explain in brief about OpenCL's kernel.	[7]
	b)	Is OpenMP parallel or concurrent? How many types of threads are there in OpenMP?	[7]
7.		Describe the features of various programming environments for heterogeneous computing.	[14]

Code No: **R164205A** **R16** **Set No. 2**

IV B.Tech II Semester Regular/Supplementary Examinations, June - 2022

CONCURRENT AND PARALLEL PROGRAMMING

(Common to Computer Science and Engineering and Information Technology)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

*****

PART–A *(14 Marks)*

1. a) Define Race condition [2]
   b) Define Deadlock [3]
   c) Why do we need searching in parallel computations? [2]
   d) Write about Switched Network Topologies [3]
   e) How can you represent arrays in cilk++? [2]
   f) How memory performance considerations are performed in OpenCL? [2]

PART–B *(4x14 = 56 Marks)*

2. a) Differentiate between Sequence and Concurrent programming with suitable examples [7]
   b) Explain about synchronization primitives in detail [7]

3. a) Compare and contrast livelock with deadlock [7]
   b) What is starvation? How to handle it? [7]

4. a) Describe in brief about types of Tree Traversals. [7]
   b) Describe in brief about Prefix computation. [7]

5. a) Illustrate about the architecture of Graphics Processing Unit. [7]
   b) Differentiate between Data Parallelism and Task Parallelism. [7]

6. a) What is the difference between work item and thread in Open CL? [7]
   b) Which is better for rendering, CUDA or Open CL? Justify. [7]

7. Heterogeneous computing involves both serial and parallel computing. Justify how OpenCL supports it. [14]

Code No: **R164205A** **R16** **Set No. 3**

IV B.Tech II Semester Regular/Supplementary Examinations, June - 2022

CONCURRENT AND PARALLEL PROGRAMMING

(Common to Computer Science and Engineering and Information Technology)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1. a) Define sequential programming. [3]
   b) What are the benefits of threading? [2]
   c) Write in brief about Parallel Traversals [2]
   d) Write in brief about Switched Network Topologies [2]
   e) List out the debuggers supported by OpenMP [3]
   f) List out any four commands in open CL [2]

PART–B *(4x14 = 56 Marks)*

2. a) Define concurrent programming. Explain two Concurrent Programming models [7]
   b) Describe the Notations used for Sequential Programs? [7]

3. a) Discuss various overheads involved in inter process communication. [7]
   b) Differentiate livelock and deadlock? Explain the necessary conditions to form a deadlock state [7]

4. a) Design a parallel algorithm for quick sort technique. [7]
   b) Explain about the steps involved in constructing a Breadth-First Search with an example [7]

5. a) Explain about Parallel computer architectures [7]
   b) Differentiate data parallelism with control parallelism. Give suitable examples. [7]

6. a) What are the steps to initialize an OpenMP Application [7]
   b) Describe the software components used in CUDA 8.0 [7]

7. C++AMP brings GPGPU into the mainstream. Justify with various features of C++AMP to support heterogeneous computing. [14]

Code No: **R164205A** **R16** **Set No. 4**

IV B.Tech II Semester Regular/Supplementary Examinations, June - 2022

CONCURRENT AND PARALLEL PROGRAMMING

(Common to Computer Science and Engineering and Information Technology)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1. a) Difference between Sequential and Concurrent Programming [2]
   b) Define Starvation [2]
   c) Write the importance of Parallel Computation [2]
   d) What are pthreads? [2]
   e) What are the profilers supported by OpenMP [3]
   f) What is heterogeneous computing? [3]

PART–B *(4x14 = 56 Marks)*

2. a) Compare and contrast synchronized method with synchronized block. [7]
   b) Give the differences between Asynchronous and parallel programming [7]

3. a) Define Dead lock. Explain in brief about Characteristics of a Dead lock [7]
   b) Give the differences between binary semaphore and mutex [7]

4. a) Define sorting. Explain in brief about Hyper quick sorting [7]
   b) Explain the steps involved in Depth First Search [7]

5. a) Explain the importance of Data parallelism with suitable examples [7]
   b) Explain the concept of Pthread library in detail [7]

6. What is meant by CUDA core/ What are different memories used in GPU? Explain hierarchy of memory with a neat diagram. [14]

7. a) Define heterogeneous computing? Differentiate homogeneous system with heterogeneous system? [7]
   b) Explain in brief about acceleration of web applications using open CL [7]