

IV B.Tech II Semester Regular Examinations, September - 2020

CONCURRENT AND PARALLEL PROGRAMMING

(Common to Computer Science & 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) What is livelock? [2]
- c) How Ranking is performed in parallel computations? [3]
- d) Why do we need parallel programming? [2]
- e) Write in brief about four-level memory hierarchy for the compute device by open CL. [3]
- f) What are the memory objects in openCL? [2]

PART-B(4x14 = 56 Marks)

2. a) Discuss in brief about the advantages and Disadvantages of concurrent programs. [7]
- b) Differentiate between Concurrent and sequence programming. [7]
3. a) What are the conditions for prevention of Dead lock? [7]
- b) Describe in brief about the Approaches for Inter-Process Communication. [7]
4. a) Define sorting. Explain in brief about Hyper quick sorting. [7]
- b) What are the steps in Breadth-First Search? [7]
5. a) Define Task parallelism. Explain in brief about Task parallelism. [7]
- b) Discuss in brief about illustration of a shared memory system of three processors. [7]
6. a) What are the steps to initialize an OpenMP Application? [7]
- b) Differentiate betweenOpenCL and OpenMP applications. [7]
7. a) Discuss in brief about C++ AMP and concurrency Visualiser. [7]
- b) Explain in brief about acceleration of web applications using open CL. [7]

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PART-A(14 Marks)

1. a) Define sequence programming. [2]
- b) What is Dead lock? [2]
- c) How Traversing is performed in parallel computations? [3]
- d) Define distributed shared memory. [2]
- e) Write in brief about the processing flow on CUDA? [2]
- f) What are the command queues in open CL execution model? [3]

PART-B(4x14 = 56 Marks)

2. a) Describe in brief about Concurrency and Parallel Programming Models. [7]
- b) What is concurrent programming? Give examples of concurrency. [7]

3. a) Differentiate between a process and a thread. [7]
- b) What are the issues and challenges in concurrent programming? [7]

4. a) Define sorting. Explain in brief about Parallel merge sorting. [7]
- b) What are the steps in Best -First Search? [7]

5. a) Explain in brief about the architecture of Graphics Processing Unit. [7]
- b) What are the advantages and dis advantages of distributed shared memory? [7]

6. a) What are the steps to initialize an OpenCLapplication? [7]
- b) Explain in brief about OpenCL's kernel. [7]

7. a) What are the key components of the graphics library in C++AMP? [7]
- b) Describe in brief about Open Cl Execution model. [7]

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Answer any FOUR questions from Part-B

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PART-A(14 Marks)

1. a) Define concurrent programming.. [2]
b) What is a thread? [2]
c) Why do we need searching in parallel computations? [3]
d) Write in brief about Switched Network Topologies. [3]
e) How can you represent arrays in cilk++? [2]
f) List out any four commands in open CL. [2]

PART-B($4x14 = 56$ Marks)

2. a) What are the Notation for Sequential Programs? [7]
b) Discuss in brief about the run time in concurrency model. [7]

3. a) What are the reasons for using the interprocess communication protocol for information sharing? [7]
b) Define Dead lock. Explain in brief about Deadlock Characteristics. [7]

4. a) Define sorting. Explain in brief about Odd even Transposition sorting? [7]
b) Describe in brief about types of Tree Traversals. [7]

5. a) Differentiate between Data Parallelism and Task Parallelism. [7]
b) Discuss in brief about Parallel computer architectures. [7]

6. a) What are the Pit falls of OpenCL applications? [7]
b) Discuss in brief about Reducers and hyperobjects in cilk++. [7]

7. a) What is heterogeneous computing? Explain in brief about heterogeneous computing. [7]
b) What are the math libraries in C++AMP? [7]

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PART-A(14 Marks)

1. a) Define message passing. [2]
- b) What is starvation? [2]
- c) Write in brief about Parallel Traversals. [2]
- d) What are the disadvantages of Processor array? [2]
- e) What are the profilers and debuggers supported by OpenMP? [3]
- f) How memory performance considerations is done in OpenCL? [3]

PART-B(4x14 = 56 Marks)

2. a) Define concurrent programming.Explain two Concurrent Programming models. [7]
- b) Discuss in brief about synchronization primitives. [7]

3. a) Discuss about Interprocess communication. [7]
- b) Discuss in brief about Bankers algorithm. [7]

4. a) Define sorting. Explain in brief about Enumeration sorting. [7]
- b) Describe in brief about Prefix computation. [7]

5. a) Differentiate between message passing and distributed shared memory? [7]
- b) Define Data parallelism. Explain in brief about Data parallelism. [7]

6. a) What are the libraries and software components in CUDA 8.0? [7]
- b) What are the advantages of CUDA over traditional general-purpose computation on GPUs (GPGPU) using graphics APIs? [7]

7. a) What is heterogeneous computing? How does a homogeneous system differ from heterogeneous system? [7]
- b) How can we declare arrays in C++AMP? [7]