

CBCS SCHEME

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18SCN/SCS152

First Semester M.Tech. Degree Examination, Dec.2019/Jan.2020 Multicore Architecture and Programming

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Distinguish instruction level parallelism and thread – level parallelism, and also elaborate the approaches adopted to support thread level parallelism both in Software and Hardware. (10 Marks)
- b. Explain Hyper – Threading Technology with a block diagram. Also elaborate the Multi – Core architecture with Hyper – Threading Technology. (10 Marks)

OR

- 2 a. With a suitable diagram, explain the relationships between processors, processes and threads in modern operating system. Also discuss the various mapping models used. (10 Marks)
- b. What is virtualization? Describe the different virtualizations used in modern computers. (10 Marks)

Module-2

- 3 a. List out the various forms of Decomposition. Explain each in detail. (10 Marks)
- b. Explain the steps involved in Error Diffusion Algorithm with example. Write a 'C' language implementation of Error Diffusion algorithm. (10 Marks)

OR

- 4 a. What is Synchronization? Explain the widely used types of synchronization operations. (05 Marks)
- b. Explain the different lock types required to accomplish the task. (05 Marks)
- c. Discuss the concept of Message Passing Model. (10 Marks)

Module-3

- 5 a. With a program in C# language, illustrate the use of windows events to communicate between threads. (08 Marks)
- b. How does AfxBeginThread() differs from CreateThread()? (04 Marks)
- c. Describe the various atomic operations performed by Interlocked function. (08 Marks)

OR

- 6 a. What is Pthread? Explain with an example, how to create and use threads with Pthreads. (10 Marks)
- b. Analyze with example, the use of callbacks in Threadpool to wait on events. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. What are the challenges involved in threading a loop? Explain any four. (10 Marks)
b. What is the need of minimizing threading overhead? List the measured costs of a set of OpenMP constructs on a 4 – way Intel Xeon processor based system. (10 Marks)

OR

- 8 a. What are the difficulties in debugging an OpenMP program? Mention the guidelines for debugging OpenMP program. (10 Marks)
b. With a suitable diagram, explain the concept of Task Queuing Execution Model. (10 Marks)

Module-5

- 9 a. In parallel programming model too many threads can degrade the performance. Discuss any five scenarios which degrade performance. (10 Marks)
b. Describe the various way that are used to prevent a low priority thread blocking a high priority thread from running. (10 Marks)

OR

- 10 a. Describe any two issues of multicore processors supposed to take care about memory. (10 Marks)
b. Explain the two common Idioms for using shared memory without a lock. (10 Marks)
