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First Semester M.Tech. Degree Examination, Dec.2015/Jan.2016

Multi Core Architecture and Programming

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

1.
 - a. Distinguish concurrency and parallelism, and discuss the approaches adopted to support thread-level parallelism, both in software and hardware. **(06 Marks)**
 - b. Explain Hyper-Threading Technology and with a block diagram, also explain the multi-core with Hyper – Threading Technology processor architecture. **(10 Marks)**
 - c. Distinguish runtime virtualization and system virtualization. **(04 Marks)**
2.
 - a. Discuss the four types of problems to be addressed when multi threading is used in programs. **(04 Marks)**
 - b. Explain the common parallel programming patterns. **(10 Marks)**
 - c. How to transform the basic error diffusion algorithm into an approach that is more conducive to a parallel solution? **(06 Marks)**
3.
 - a. What is synchronization? Explain the widely used two types of synchronization operations. **(05 Marks)**
 - b. Discuss the various lock types. **(05 Marks)**
 - c. Explain message passing model. **(10 Marks)**
4.
 - a. How does AfxBeginThread() differs from createThread()? **(05 Marks)**
 - b. Why should developers be careful when calling suspendThread()? How to safely suspend threads? **(05 Marks)**
 - c. Explain the concept of thread pool with an example in .NET. **(10 Marks)**
5.
 - a. Explain user-level threading package offered by windows called fibers. **(10 Marks)**
 - b. What is pthread? Explain with an example, how to create and use threads with pthreads. **(10 Marks)**
6.
 - a. In OpenMP, what are the different ways the memory can be declared as private? **(04 Marks)**
 - b. What are the clauses provided by OpenMP standard to accomplish the data copy in and copy out operations? **(04 Marks)**
 - c. Describe the four most heavily used OpenMP library functions. **(08 Marks)**
 - d. List the factors that threaded application performance with OpenMP is largely depended upon. **(04 Marks)**
7.
 - a. Explain critical and atomic programs supported by OpenMP standard with an example. **(10 Marks)**
 - b. Explain the task queuing execution model. **(10 Marks)**
8.
 - a. Explain convoying and priority inversion in parallel programming. **(06 Marks)**
 - b. What are non-blocking algorithms? Discuss its advantages and disadvantages. **(06 Marks)**
 - c. How do you conserve memory bandwidth and avoid memory contention in multi-core processors? **(08 Marks)**

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