The following is a list of possible questions for our quiz on April 16th. Some of the questions will not be asked in the quiz. All the questions that will appear in the quiz will appear exactly as shown below (however, numeric parameters may be changed). The quiz is closed textbook, closed notes and closed neighbors. Note that the questions, which did not appear in this quiz, still may appear in the exams. You will find a solution for these questions during lectures.

#1: What are parallel buses? What are serial buses?

#2: Show the formula to calculate “bus throughput”?

#3: Recent serial buses have higher bus throughput than parallel buses. How is that possible?

#4: What are the four hardware architecture for “parallel computers”?

#5: What are “tightly coupled systems”?

#6: What are “loosely coupled systems”?

#7: What are the two different types of tightly-coupled multi-processor system?

#8: How are “functionally-specialized multi-processor systems” different from “tightly-coupled multi-processor systems” (i.e., “what is the difference”)?

#9: Mention three different examples for “functionally-specialized multi-processor systems”.

#10: Sketch the internal hardware structure for “blade servers”.

#11: What are “distributed systems”?

#12: Which of the four parallel computer architecture do typical “super-computers” use?

#13: What are three different types of tightly-coupled multi-processor systems?

#14: What are “fine-grained tightly-coupled multi-processor systems”?

#15: What is the typical “granularity” for processor assignments in fine-grained tightly-coupled multi-processor systems?

#16: If a fine-grained tightly-coupled multi-processor system consists of two or four processors (or processor cores), its performance usually will not achieve two or four times better performance (execution speed) compared to its single-processor counterpart. What is the major cause of the problem?
#17: What are “medium-grained tightly-coupled multi-processor systems”?

#18: What is the typical “granularity” for processor assignments in medium-grained tightly-coupled multi-processor systems?

#19: What are “threads”?

#20: What are the three parallel models in “Flynn’s Classification”?

#21: How does “SIMD” parallel architecture work?

#22: How does “MIMD” parallel architecture work?

#23: Which Flynn’s parallel model does Intel core 5 multi-core processor belong to?

#24: There is no real computer system that belongs to MISD model. Why not?

#25: Using a single-core SISD processor, what is the algorithm complexity (execution time) of performing $N^2$ matrix multiplication? What is the algorithm complexity (execution time) if SIMD processor (with an infinite number of processing units) is used?