TIE-51256 Computer Architecture
exam 19.5.2015
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Answers in English or in Finnish. Calculators can be used.

1. Explain shortly (max 2 lines of text):
   a) strip mining (1p)
   b) EPIC (1p)
   c) HSA (1p)
   d) TTA (1p)
   e) anti dependency (1p)
   f) SIMD (1p)

2. What is the difference between VLIW and static multiple-issue processor? What is the principal difference between static and dynamic multiple-issue processors? (2p)

3. Describe mechanisms to improve ILP (4p)

4. How increasing associativity in cache affects miss rate and hit penalty? How increasing block size affects miss rate and miss penalty? Assume that the cache size is constant. (2p)

5. Multithreading. What are the benefits and disadvantages of coarse-grained multithreading compared to fine-grained? (4p)

6. Assume a 64-byte cache memory, which uses 8-byte blocks. The cache is 2-way set associative and uses LRU mechanism to replace blocks in the cache. Processor uses 16-bit virtual addresses to access 16kbyte main memory. How many bits are needed for the tag fields in the cache? Draw principal cache organization and explain your solution. (6p)