TIE-51256 Computer Architecture
exam 25.2.2014
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Answers in English or in Finnish. Calculators can be used.

1. Explain shortly (max 2 lines of text):
    a) stride (1p)
    b) EPIC (1p)
    c) RAW (1p)
    d) TTA (1p)
    e) strip mining (1p)
    f) TLP (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. Where and why translation lookaside buffer is used? (4p)

4. Why loop unrolling is used? What could be an alternative? (6p)

5. SIMD vs. MIMD. Explain both terms. How they are different? Where they are used? Which one is more energy-efficient and why? (6p)

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)