TKT-2431 SoC-suunnittelu and TKT-2437 SoC design exam Mon 12.12.2011

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D. You may use any calculator

You may do whatever you wish to the exam paper

- Please answer in Finnish if possible.
- In addition to text, please use equations, figures, and tables. Moreover, give examples in your answers.
- Remember to highlight the differences between compared methods/things, and tell when one should use each of them.
- Don't expect that the reader is psychic, please explain things carefully.

1. About the exercise (á 1p)
   a) What 2 properties/changes affected the performance most?
   b) Describe their trade-offs (e.g. performance increase vs. design effort vs. HW area etc.)
   c) Exercises used special DCT/quantization HW unit. Which of the 3 basic IP component types best describes it? Why?
2. Explain the following (á 2p)
   a) Amdahl's law
   b) The concept of power state machine.
   c) Bisection bandwidth of a communication network
   d) Mixed-level simulation
   e) ASIP
   f) Network topology
3. System-on-Chip is usually divided into *domains* (aka. logic islands). Explain the properties and purposes of the 3 main domain types and how do they affect verification and testing? (3p)
4. Explain the following (á 4p)
   a) The main idea of platform-based design.
   b) Data-parallel vs. function-parallel processing
5. Rate yourself. It is important to recognize one's own capabilities in oder to make project schedules and specifications etc. Therefore, the last task is to estimate how many points you'll get in questions 1a-4b. Textual analysis is also appreciated in addition to accuracy.(4p)