

Tentamen i kursen
System Design and Methodology- TDTS 30
2004-03-08, kl. 8 - 12

Hjälpmedel:

Engelsk ordbok.

Supporting material:

English dictionary.

Poänggränser:

Maximal poäng är 30.
För godkänt krävs sammanlagt
16 poäng.

Points:

Maximum points: 30.
In order to pass the exam you need a
total of minimum 16 points.

Resultat:

Senast 2004-03-23.

Results available:

Latest 2004-03-23.

Jourhavande lärare:

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Good luck !!!

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Du kan skriva på svenska eller engelska!

1. a) What does it mean by data-driven and control-driven concurrency?
 b) Give an example for each of them.

(3p)

2. a) Formulate the synchrony hypothesis for FSMs. What does it imply?
 b) Under which assumptions can we correctly implement a synchronous FSM model?

(3p)

3. Give an example and show how determinism is lost with a GALS model as opposed to a synchronous FSM.

(2p)

4. Define Kahn process networks.
 Show by an example how determinism is guaranteed with Kahn process networks.
 Transform the example and show that a more general dataflow network, which is not a Kahn process network, does not guarantee determinism.

(3p)

5. What is the problem with discrete event simulators and zero delay components? How can it be solved?
 Illustrate by an example.

(2p)

6. We have identified three properties which can be analyzed on systems modeled as Petri Nets:
 - Boundedness.
 - Liveness.
 - Reachability.
 How is each of these properties defined?
 What is the practical significance of each of these properties (what does it say about the system)?

(3p)

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7. Describe a simple design flow for processor specialization. Illustrate also by a figure. Comment on the design tools you need.
How does this differ from the design flow for a platform definition?
(3p)
8. What does it mean by IP (core) based design? What types of cores can you choose from? Comment on each of them.
(2p)
9. Illustrate by a diagram the trade-off energy consumption vs. flexibility for ASIC, FPGA, ASIP, and general-purpose processor.
(2p)
10. a) Formulate the scheduling problem for a set of real-time tasks.
What does it mean that a task set is schedulable?
b) What does it mean by preemptive and non-preemptive scheduling?
(2p)
11. What is good with static cyclic scheduling? What is bad?
(2p)
12. a) What is the basic principle for task scheduling on DVS processors?
b) What is the problem if we consider particularities, concerning power consumption, of individual tasks?
c) How do we solve the problem that only discrete voltage levels are available?
(3p)