



Försättsblad till skriftlig tentamen vid Linköpings Universitet

Datum för tentamen	2012-05-22
Sal (1) Om tentan går i flera salar ska du bifoga ett försättsblad till varje sal och <u>ringa in</u> vilken sal som avses	TER2
Tid	8-12
Kurskod	TDDI08
Provkod	TEN1
Kursnamn/benämning Provnamn/benämning	Konstruktion av inbyggda system En skriftlig tentamen
Institution	IDA
Antal uppgifter som ingår i tentamen	12
Jour/Kursansvarig Ange vem som besöker salen	Petru Eles
Telefon under skrivtiden	0703681396
Besöker salen ca kl.	10:15
Kursadministratör/kontaktperson (namn + tfnr + mailaddress)	Gunilla Mellheden, 282297, gunilla.mellheden@liu.se
Tillåtna hjälpmedel	Ordbok
Övrigt	
Vilken typ av papper ska användas, rutigt eller linjerat	
Antal exemplar i påsen	

LINKÖPINGS TEKNISKA HÖGSKOLA
Institutionen för datavetenskap
Petru Eles

Tentamen i kursen
Embedded Systems Design - TDDI08
2012-05-22, 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.

Jourhavande lärare:

Petru Eles, tel. 0703681396

Good luck !!!

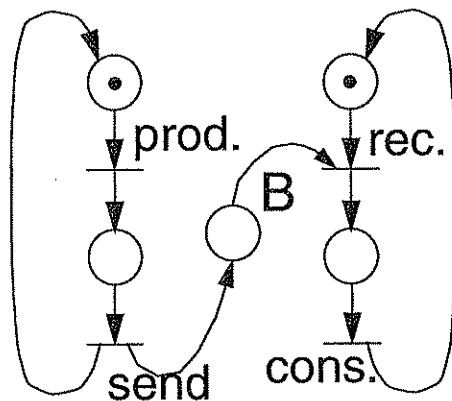
Tentamen i kursen Embedded Systems Design - TDDI08, 2012-05-22, kl. 8-12
Du kan skriva på svenska eller engelska!

1. a) Describe, using a flow graph, the design flow of an embedded systems, from an informal specification to fabrication.
 b) Give short comments on the design steps which belong to the system-level.
 c) Why is the proposed design flow better than the traditional one?
(3p)

2. a) What does it mean by data-driven and control-driven concurrency?
 b) Give an example for each of them.
(2p)

3. Give an example and show how determinism is lost with a GALS model as opposed to a synchronous FSM.
(2p)

4. The figure below represents a Petri Net model for two processes, a producer and a consumer, which are communicating through a buffer; the buffer is represented by place B.
(2p)



- a) Is this Petri Net model bounded?
 b) How large is the buffer?
 c) Which transitions are enabled in this state of the model and why?
 d) Draw a similar model in which the buffer has a dimension of four slots.
(3p)

5. How does a discrete event simulator work?
 Illustrate by a flow-graph.
(3p)

Tentamen i kursen Embedded Systems Design - TDDI08, 2012-05-22, kl. 8-12
Du kan skriva på svenska eller engelska!

6. Define Kahn process networks and synchronous dataflow models.
Give an example of a Kahn process network. Show that it cannot be statically scheduled.
Adjust the example such that it becomes a synchronous dataflow model. Show a static schedule for this new model.
(3p)
7. We have introduced Systems on Chip with a dynamically reconfigurable datapath; this datapath can be reconfigured to act as an accelerator for the actual program running on the processor. What are the main steps for compiling the source code for such a system? What will result as the outcome of this compilation?
(2p)
8. What does it mean by an Application Specific Instruction Set Processor (ASIP)?
We have discussed five dimensions of specialization for ASIPs. Which are those five?
Comment on each of them.
(3p)
9. What does it mean by IP (core) based design? What types of cores can you choose from?
Comment on each of them.
(2p)
10. We have introduced three particular policies for shut-down with Dynamic Power Management: time-out, predictive, and stochastic. Describe the main characteristics of each.
Compare.
(3p)
11. a) Formulate the scheduling problem for a set of real-time tasks.
b) What does it mean that a task set is schedulable?
c) What does it mean by preemptive and non-preemptive scheduling?
(2p)
12. What is good with static cyclic scheduling? What is bad?
(2p)