

Name.....Pnr.....

Programme (circle the appropriate):  
DV F MN Fristående Distance

## **Exam, Computer Architecture**

Courses 1DT157, 1DT631, 1DT720, 1TT441  
Saturday 18/12/2004 at 9:00 am – 11:00 am

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### **Important information about this exam:**

Don't forget to circle the educational programme you are following. That will make it easier for us to report the results.

Answer every question with at most two sentences of normal length. Most questions can have even shorter answers, and some can be answered in a single word. Too long answers will mean a reduced score since what is being tested here is also the ability to discern relevant information.

**Write your answer in the space immediately below each question. Do not** use a separate sheet for answers.

Answers to open questions (of type "what is..." or "explain how...") must demonstrate an understanding beyond spelling out acronyms. For example, if the question is "What is DMA" the answer "Direct Memory Access" gets 0 points.

You may answer in English or in Swedish.

Note that there are questions on both sides of the sheets and that the exam begins on the other side of this sheet.

There are 30 questions that each can give at most 1 point. A pass requires 20 points, and an extra credit towards a higher grade requires 25 points.

Good luck!

1. What is the difference between static and dynamic **branch prediction**?
  
2. Through what parts of a CPU does a **data path** normally pass?
  
3. What is a **pipeline stage**?
  
4. Write the truth table for the **NOR** gate.
  
5. What does it mean that a cache memory uses the **write back** strategy?
  
6. Consider a **decoder** with 4 inputs on which are sent the signals 0,1,1,0. How many outputs does the decoder have and what values will be sent on them?
  
7. What is a **PLA**?
  
8. Explain how **phase modulation** can be used to transmit a binary signal.
  
9. What is the function of a **bus arbiter**?
  
10. What is a normal **wordlength** for a modern high performance CPU? Choose between (circle the correct alternative)  
  
8    29    64    81    256    257

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11. What is the purpose of a **handshake** on an asynchronous bus?
  
12. Give an example of an **interpreter** within a CPU.
  
13. What is **UNICODE**?
  
14. What is a better alternative to input by **busy waiting**, and why is it better?
  
15. Why is **dynamic RAM** cheaper per bit than static RAM?
  
16. On a **CD-R** there are no lands and pits. Instead what is it that encodes the information?
  
17. What is the opposite of **RISC**?
  
18. Give one example of where a **prefetch buffer** is useful.
  
19. In a hard disk, what is the function of the **disk head**?
  
20. Who built **ENIAC**?

21. Explain the concept of a **virtual machine**.
  
22. What is a **bus skew**?
  
23. What does it mean that an architecture is **superscalar**?
  
24. In **two's complement**, given a number  $n$  how do you compute  $-n$ ?
  
25. What does it mean that a latch is **edge triggered**?
  
26. Fill in the right word:  
The **bit rate** is measured as the number of bits per \_\_\_\_\_
  
27. What is the disadvantage of a **ripple carry adder** as compared to more advanced adders such as carry select?
  
28. **In memory mapped I/O** there is no need for special assembly instructions to deal with I/O. What kind of instructions instead serve to do I/O?
  
29. What is a **flash memory**?
  
30. What is the advantage of a **serial bus** over a parallel bus?
  
31. Give the name of an illness that many experienced programmers of common business oriented systems suffer from.