

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

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

Exam, Computer Architecture

Courses 1DT157, 1DT631, 1DT720, 1TT441

Wednesday 23/3/2005 at 10:00 am – noon

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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 a **disk cylinder**?
2. **Ripple carry** and **carry select** are two types of adders. Which is the fastest and which uses the least number of logical gates?
3. Give the truth table of **NAND**.
4. How is the operand address computed in **based-index addressing**?
5. What is the purpose of **LRU** in connection with cache memories?
6. What is an **interrupt controller**?
7. What is the purpose of the **parity bit** in memories?
8. Explain the concept of **register window**.
9. Name one advantage of the **USB** bus over the **PCI** bus. Conversely, name one advantage of the **PCI** bus over the **USB** bus.
10. Explain the difference between a **microinstruction** and an **assembler instruction**

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11. What advantage is gained by making a bus **multiplexed**?
12. What does the **program counter** contain?
13. What is a **PLA**?
14. High performance CPUs use **register renaming** to execute programs faster.
Explain why programs run faster when register renaming is used.
15. **Charles Babbage** built what is often referred to as the first general purpose computer. What was it called?
16. Explain how **RAID** disks can increase the transfer rate of information between disk and CPU.
17. What is **bus skew**?
18. What does the **bus protocol** regulate?
19. What is the difference between **ROM** and **PROM**?
20. Why does a **pipeline** speed up program execution?

21. Explain how **memory-mapped I/O** works.
22. What is a **RAW dependence**?
23. What does it mean that a cache is **set-associative**?
24. What is a **basic block** in a program?
25. Give three characteristics of a **RISC** architecture.
26. What is decided in **bus arbitration**?
27. Explain the concept of **circuit equivalence** for networks of logical gates.
28. What is a **cache line**?
29. A **DMA** transfer might involve cycle stealing. What kind of cycles is it that are stolen?
30. What output is sent on an **SR-latch** if both S and R are 0?