Name……..Pnr…….

Exam, Computer Architecture 1DT631
Wednesday 22/10/2003 at 9am-11am

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Inga hjälpmedel

Important information about this exam:

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.

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.

Each question can give at most 1 point. There are 30 questions in all. A pass requires 22 points.

Good luck!

1. In a hard disk, what does the disc **head** do?

2. In a microcoded processor, the **microinstructions** must be easy to decode, while the machine instructions may be complex. Explain why.

3. Explain the concept of **circuit equivalence** in digital logic.

4. Name one advantage that **inkjet printers** have over laser printers.

5. Most computers today use **DMA**. What advantage is gained by using DMA?

6. What does it mean that a processor is **superscalar**?

7. Explain how **based-indexed addressing** works.

8. In what unit is the **resolution of printers** normally measured?

9. Explain how **frequency modulation** works.

10. What kind of information is contained in the **control store**?

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11. In a **CRT** a cathode emits a ray which hits a phosphorent screen. What kind of particle makes up the ray?

12. 0xab should be sent on a 16 bit bus with **sign extension**. What bit pattern is sent on the bus? Answer in hexadecimal.

13. Name two differences between **L1 cache** and **L2 cache**.

14. Advanced processors have something called a **scoreboard**. What is the purpose of this?

15. When the instruction at memory address *x* is executed, what instruction is probably being fetched to the **prefetch buffer,** and why?

16. Give one reason why **two's complement** is better than **signed magnitude**.

17. What program translates **assembly language** to machine language?

18. What instruction is contained in the **instruction register**?

19. Early computers were often **batch systems**. Also some modern computers can be run as batch systems in order to increase throughput. What does it mean to be a batch system?

20. Why is the **CD-RW** technology not a threat to magnetic hard disks?

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21. What does it mean that an ALU is **bit sliced**?

22. Give three differences between **static and dynamic RAM**.

23. What are **ISA** and **PCI**? (You do not need to spell out the acronyms, just explain what kind of thing they are).

24. When an **interrupt** occurs, which unit is being interrupted? Also, give one example of a unit that can interrupt.

25. In the MIC architecture there is a **program counter** but not a microprogram counter. Why?

26. What can cause a **pipeline stall**?

27. What is a **Hamming code**?

28. A **ripple carry adder** is simple but has a strong disadvantage when adding long numbers. What is the disadvantage?

29. What is a **cache line**?

30. How is a **PROM** different from a **ROM**?