

Name:

DD2377 Maskinnära programmering och datorarkitektur, 2011

Tentamen 2011-03-17

Instructions:

- Make sure that your exam is not missing any sheets, then write your full name on the front.
- Write your answers in the space provided below the problem. If you make a mess, clearly indicate your final answer.
- The exam has a maximum score of 40 points plus 3 possible bonus points.
- The limits for grades on this exam are:
 - To pass (grade E): 20 points.
 - For grade D: 24 points.
 - For grade C: 28 points.
 - For grade B: 32 points.
 - For grade A: 36 points.
- You're allowed to bring five sheets of paper with any text to this exam but no computer, calculator, telephone etc.

Problem 1. (10 points):

Give short explanations (in Swedish or English) of the following computer systems concepts.

- ASCII

- Pipelining

- Process

- TCP

- DoS

Problem 2. (6 points):

Consider a **5-bit** two's complement representation. Fill in the empty boxes in the following table:

Decimal Representation	Binary Representation
0	
3	
-8	
	00110
	10000
	11110

Problem 3. (6 points):

Describe a sequence of logical operations (along with their corresponding masks) that, when applied to an input string of 32 bits, produces an output of all zeroes if the input string both begins and ends with two zeroes. Otherwise, the output should contain at least one 1. In addition, explain how your solution works.

Problem 4. (10 points):

Consider the following NIC assembly code:

```
word x

loadc r0 0x0a
loadc r1 2
loadc r2 x

A:    storer r1 r2
      addc r1 2
      addc r2 2
      jumple r1 A

      halt
```

- Describe what happens when this program is executed.
- Translate the code into machine language. The program should start at memory position 0.

Problem 5. (8 points):

- What is a proxy server and what are its benefits?

- What is the booting process and why is it necessary?