

Name	Signature	Student Id Nr	Points

581305-6 Computer Organization I, miniexam 1, 17.11.2016 (10p)

Write your answer on this exam paper in the space given. Please notice, that the exam paper is 2-sided.

a) [3 p] Hardware level instruction fetch/execute cycle (instruction cycle)

i. What are the stages in instruction cycle, and what happens in them?

ii. Where in the processor and in the overall system can one machine instruction cause state changes? In which stages of the instruction cycle do those changes occur?

b) [3 p] Processor execution modes: privileged (supervisor) and user mode.

i. Why does the processor have two different execution modes? Why wouldn't you just execute in one mode all the time?

ii. What all is allowed in privileged mode that is not allowed in user mode?

iii. When and how does the execution mode change from user mode to privileged mode?
When and how do you get back to user mode?

c) [4 p] Interrupts

- i. Define the concept "interrupt" (exception, fault).
- ii. Describe three (3) different types of interrupts, and explain what might cause them.
- iii. How does the hardware know that an interrupt has occurred, when does it check for interrupts, and what does it do if an interrupt has occurred? As an example, use one of interrupts you described in part (ii).
- iv. What is an interrupt handler belonging to the operating system? When and how is the interrupt handler executed? As an example, use one of interrupts you described in part (ii).