Name	Signature	Student Id Nr	Points

## **5**8

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

		-6 Computer Organization I, miniexam 1, 10.11.2015 (10p) answer on this exam paper in the space given. Please notice, that the exam paper is 2-sided.
a)	[3 p] Ir i.	nstruction fetch/execute cycle.  How do you know which instruction is currently in execution?
	ii.	How do you know which instruction is next in execution? Where in memory is it usually (most often)?
	iii.	When does the next instruction to execute change during the execution of the current instruction?
	iv.	When does the next instruction to execute change after the execution of the current instruction?
b)		rogram location in memory. Assume that the memory are referable by program P is defined with and limit registers (BASE and LIMIT).  If there is a reference in program code to address 210, which main memory address is referred to? How is address mapping done?
	ii.	How do you control, that program P cannot read or modify the memory areas for program Q? Where in fetch/execute cycle does this control happen?  Is the controlling done by program P, program Q, the operating system, or system hardware?

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i. What is an interrupt? Why do you need interrupts? How do you know if an interrupt has occurred? For what type of interrupts is the system prepared for? For what type of interrupts is the system not prepared for?

ii. Assume that division R1/R2 between integer registers R1 and R2 causes an erroneous situation because R2 value is zero. How/where/when does the hardware (in the fetch/execute cycle) notice the problem and how/where/when (in the fetch/execute cycle) does the control transfer to operating system (OS) code handling this type of errors? How does the OS react to this situation?