

Name	Signature	Student Id Nr	Points

581305-6 Computer Organization I, miniexam 3, 8.12.2015 (10p)

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

- a) [3 p] What data is included in the processor context of the process control block (PCB)? On what principle do you decide what data belongs to the processor context? Why does some register belong to it, but some other register does not? When is the processor context stored in the PCB and when do you read it from the PCB?

- b) [2 p] Give an example on an event E, which results in moving a suspended (waiting, blocked) process (P) to ready-to-run (ready) state. What happens after that to process P and to process Q, that was running when event E occurred?

- c) [3 p] Why is interrupt driven I/O (indirect I/O) more effective way for the system to implement I/O than programmed I/O (direct I/O)?

In which two ways is DMA I/O even more effective than interrupt driven I/O?

- d) [2 p] Assume that user level process (P) asks the device driver (DD) to copy a 16 MB buffer area to disk, which is controlled by the device controller process (DC) running on its device controller. The device driver is implemented as an operating system process, and the I/O is implemented as DMA I/O. Explain, how the I/O is implemented with co-operation of P, DD, and DC. Especially, how the processes communicate with each other, in which process state P and DD are during the I/O stages, and what causes P and DD state changes?