Name	Signature	Student Id Nr	Points

581305-6 Computer Organization I, miniexam 3, 15.12.2016 (10p)

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

a) [3 p] When the turn to execute on a processor for any given process P ends, that process may be (i) moved back to Ready queue, (ii) moved to suspended state in some waiting queue, (iii) removed completely from the system. Give a concrete example to each case: what event caused P to lose its turn to execute, what happens now in the system at process control level, and when will process P get back to execute, if ever?

b) [2 p] Assume that process P is in execution and that it will be suspended waiting for a message from process R.
Process Q is next in line to execute. How is the process switch from process P to process Q done in practice?
What data is copied to where? What data does not need to be copied? Give examples.

c) [3 p] Process P has given device driver DD (separate process) a request to some I/O, and will wait until its I/O request is satisfied. DD is waiting for a DMA device controller DC to complete its I/O task. How does the DC tell DD, that the I/O task given to it is done? What happens in the system so that DD can process the DC task completion event? What happens in the system so that P can continue its execution once DD has completed the I/O request given to it?

d) [2 p] You must read one 10 MB file F from a hard disk (HDD). Sector size is 4 KB. How do you compute the time needed to read one sector? How do you compute the time needed the read the whole file F? How could you minimize the time to read file F? Does it matter (for the minimum time to read F) whether the hard disk device has one or 10 surfaces? Explain.