Name	Signature	Student Id Nr	*Points*

Operating Systems, miniexam 3, 20.2.2019 (12p)

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

a) [total 4 p] Uniprocessor systems scheduling
SPN (Shortest Process Next) gives usually better average response time than FIFO (First-In-First-Out) or RR (Round Robin).
[1 p] What data is SPN actually based on?

[1 p] If that data is not exactly available, how can you estimate it? What is that estimation based on?

[1 p] VRR (Virtual Round Robin) is a variant of RR. Which RR problem does VRR solve and how?

[1 p] FS (Feedback Scheduling) is a variant of RR. Which RR problem does FS solve and how?

b) [total 4 p] Multiprocessor systems scheduling. GS (gang scheduling).
[2 p] How does GS work (as a variant of RR)?

TURN

[2 p] What problem is there with GS, if each process has the same (RR) time slice?

How should you set the time slices lengths for processes, and why should GS now work better than with similar length time slices for all processes? What is the measure of goodness here?

c) [total 4 p] Real time systems scheduling
[1 p] When can you use RMS (Rate Monotonic Scheduling)? How does it work?

[1 p] Why is RMS better than deadline scheduling, which is often used in real time systems?

[2 p] Explain priority inversion problem. (How is it possible than higher priority work may have to wait a long time for lower priority work, even though preemptive priority based scheduling is used?)
Give one solution method for priority inversion problem.