Name	Signature	Student Id Nr	*Points*

Operating Systems, miniexam 3, 19.2.2020 (12p)

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

a) [3 p] Round-Robin (RR) scheduling
On what criteria would RR be better than FIFO (FCFS)?

Why does RR usually prefer I/O-bound jobs?

How should one adjust RR time quantum, so that RR would work optimally for I/O-bound jobs?

When is the time quantum too short? When is it too long?

b) [3 p] Shortest Process Next (SPN)
On what criteria would SPN be better than FIFO (FCFS)?

Why does SPN usually prefer I/O-bound jobs?

How do you define the shortest process exactly?

How do you estimate process “length”, if you do not know exactly, how “long” it is?

TURN

c) [3 p] Real time system has two periodic tasks (A and B), and one aperiodic task (C). Tasks A arrive in 50 ms interval, and require 15 ms cpu time. Tasks B arrive in 20 ms interval, and require 5 ms cpu time. At most one aperiodic task C arrives in any given 100ms interval, and they require max 5 ms cpu time. Class A tasks must complete within 50 ms, tasks B within 20 ms, and tasks C within 100 ms. All tasks are critical, and they must be completed within their deadlines.

Is there a scheduling method that would guarantee all tasks to be completed in time?
If not, why not? If yes, why and how does it work?

d) [3 p] Explain priority inversion problem.

Why is it a problem in real time systems, but not in ordinary systems?

How does *priority inheritance* solution method work for priority inversion problem?

What problem is there with the priority inheritance solution?