

Topics for oral exam in RTOS 2023

The student will pick by lottery one of the topics below.

Then the student will be questioned for approximately 14 minutes within the topic using relevant exercise solution programming code as starting points for the discussion - questions regarding the underlying theory within the topic will also be asked. Then the grade (Danish 7-scale) will be given. No notes of any kind are allowed during the exam. For each topic the relevant exercise solutions are enlisted below.

The programming code of the published solutions will be without any comments and no notes of any kind are allowed during exam. The published solutions will appear in December.

Topics:

- 1) Threads their creation and scheduling using priorities and/or round-robin
 - a. RTOS unique-ID server exercise
 - b. BBB_prio_scheduling_exercises
- 2) Mutual exclusion and solutions to the priority inversion problem
 - a. RTOS Exercises in mutual exclusion II semaphores and events Exercise 2: Parking
 - b. freeRTOS_exercises_dining_philosophers
 - c. BBB_priority_inheritance_ceiling_exercises
- 3) Monitors and condition variables
 - a. pthread_monitor_exercise
 - b. pthread_condition_variable_exercise
- 4) Synchronization using events or semaphores or queues
 - a. RTOS Exercises in mutual exclusion II semaphores and events exercise 3: calculator threads.
 - b. Sleeping_barber_exercise_small
 - c. RTOS unique-ID server exercise
- 5) Administering many resources of the same kind using semaphores or queues
 - a. RTOS Exercises in mutual exclusion II semaphores and events - exercise 2: Parking
 - b. freeRTOS_exercises_dining_philosophers – part d)
- 6) The deadlock problem and its solutions
 - a. freeRTOS_exercises_dining_philosophers