Real-Time Operating Systems
Written Exam

1 Question

Consider the task set $\Gamma = \{\tau_i = (C_i, T_i, D_i)\}$, with $\tau_1 = (12, 80, 72)$ $\tau_2 = (6, 40, 40)$ $\tau_3 = (4, 20, 16)$ $\tau_4 = (12, 52, 30)$.
Is the task set schedulable in a POSIX compliant OS with a worst case kernel latency $L = 3$? Motivate your answer and explain how you would schedule Γ (scheduling policy, scheduling parameters, etc...).

2 Question

Explain what a preemptable kernel is, highlighting the differences respect to a traditional non-preemptable kernel, and explain how kernel preemptability is implemented in Linux.

Also describe the advantages and drawbacks of using a preemptable kernel in a real-time system.

3 Question

Briefly describe how to implement a cyclic executive.

4 Question

Describe the EDF scheduling algorithm, comparing it with another real-time scheduling algorithm at your choice. Shortly discuss the advantages and disadvantages of the two algorithms.