Yanıtlar
1.

Hard real-time systems (e.g., Avionic control, robot control, Biomedical instruments).

Firm real-time systems (e.g., Banking, POS Machine ).

Soft real-time systems (e.g., Video on demand).

Hard deadline: penalty due to missing deadline is a higher order of magnitude than the reward in meeting the deadline
Firm deadline: penalty and reward are in the same order of magnitude
Soft deadline: penalty often lesser magnitude than reward

2.Memory Management

Standard methods Block-based, Paging, hardware mapping for protection
No virtual memory for hard RT tasks Lock all pages in main memory
Many embedded RTS do not have memory protection – tasks may access any blocks – Hope that the whole design is proven correct and protection is unnecessary to achieve predictable timing to avoid time overheads
Most commercial RTOS provide memory protection as an option Run into ”fail-safe” mode if an illegal access trap (tuzak) occurs
Useful for complex reconfigurable systems

3.Advantages & Disadvantages semaphores

Advantages with semaphores

Simple (to implement and use)

Exists in most (all?) operating systems

It can be used to implement other synchronization tools Monitors, protected data type, bounded buffers, mailbox etc

Disadvantages (problems) with semaphores

Deadlocks

Loss of mutual exclusion

Blocking tasks with higher priorities (e.g. FIFO)

Priority inversion !

4.
AppTaskStart – starts tasks
AppTaskRobotStart - initialization
AppTaskRobotControl – the main control task
AppTaskRobotLeftMotorDrive – the left motor control task
AppTaskRobotRightMotorDrive – the right motor control task
AppTaskRobotLeftMotorPID – the left motor PID controller task
AppTaskRobotRightMotorPID – the right motor PID controller task
AppTaskRobotInputMonitor – the task to monitor button and bump sensor events.