Real Time (Basics)

1- Give the definition of the following keywords:
- critical section:
- semaphore:
- mutex:
- dead lock:
- multithreading:
- sleep vs wait:
- mutual exclusion:

2- When static thread priorities are required?

3- Should mutexes be FIFO?

4- What about real-time for client/server architectures?
4a- use signal, slot, method, proxy , stubs
4b- what about heartbeat management?

5- What are the differences between fault tolerance and load balancing?

6- Why atomic regions need to be relatively small?

7- The Dining Philosophers Problem
Imagine that five philosophers who spend their lives just thinking and easting. In the middle of the dining room is a circular table with five chairs. The table has a big plate of spaghetti. However, there are only five chopsticks available, as shown in the following figure. Each philosopher thinks. When he gets hungry, he sits down and picks up the two chopsticks that are closest to him. If a philosopher can pick up both chopsticks, he eats for a while. After a philosopher finishes eating, he puts down the chopsticks and starts to think.

7a- Write down the execution flow
7b- Write the program in the language of your choice
7c- How to avoid deadlocks?
7c- How to avoid startvation?