1. Process Scheduling Policy
For each of the following scheduling algorithms, state whether starvation is possible, and if so describe a scenario in which it could happen:
   a. First come, first served
   b. Shortest job first
   c. Round robin
   d. Priority

2. Synchronization
List and explain the three conditions that are necessary for a complete solution to the Critical Section problem.

3. Semaphores
   a. Explain how the Test-and-Set memory operation works.
   b. Explain how a general semaphore (not just a mutex) works.
   c. Explain how Test-and-Set can be used to implement a general semaphore using shared memory.

4. Bounded Buffer
   a. Describe the Bounded Buffer problem.
   b. Explain why two semaphores are needed in order to solve implement a solution to the Bounded Buffer problem.

5. Deadlock
Consider a system with three processes P1, P2, and P3 that can allocate three resources R1, R2, each of which has a single instance. The sequence of allocation requests and grants is as follows:

   (1) P1 requests R1
   (2) P1 is granted R1
   (3) P2 requests R2
   (4) P2 is granted R2
   (5) P3 requests R1
   (6) P2 requests R1
   (7) P1 requests R2

Assuming the other conditions necessary for the system to deadlock are present (mutual exclusion, hold-and-wait and non-preemption), show whether the system is in deadlock at the end of this sequence of operations using a Resource-Allocation Graph.