Worksheet 5.2: Multiple-Choice Questions

In the questions below, circle the right answer. There is only one correct answer

1. What’s the critical-section problem?

a. It’s a synchronization problem that is unique to the bounded-buffer problem.
b. It’s an open problem in Computer Science, and there are currently no known solutions to it.
c. It’s a synchronization problem that occurs when multiple parallel processes try to update a shared variable at the same time.
d. It’s a problem that can be solved only using semaphores.
e. Both b and c are correct. f. Both a and c are correct. g. Both c and d are correct.

2. Which of the following is (are) true about locks and semaphores?

a. A semaphore is more powerful than a lock.
b. A lock is more powerful than a semaphore.
c. A lock is binary, while a semaphore can have more than two values.
d. Semaphores are used only on single-core systems, while locks are used only on multi-core systems.
e. Both b and c are correct. **f. Both a and c are correct.** g. Both a and d are correct.

3. Which of the following is (are) true about spin locks and mutex locks?

a. A process waiting on a spin lock uses CPU cycles but a process waiting on a mutex lock does not.
b. Using mutex locks involves more context switching.
c. Using spin locks is more efficient on a single-CPU system.
d. Using spin locks is more efficient when the process waits for a long time.
e. Both b and c are correct. f. Both a and d are correct. **g. Both a and b are correct**.

4. How does protecting a critical section (CS) with a semaphore ensure mutual exclusion?

a. When a process is in its CS, it never loses the CPU until it completes the CS.
b. When a process is in its CS, all other processes are placed in the waiting state.
c. When a process is in its CS, no other process is allowed to be in a CS.
d. When a process is in its CS, any process that tries to access a CS that is protected by the same semaphore is placed in the waiting state.
e. Both b and d are correct. f. Both c and d are correct. g. Both b and c are correct.