

5. Locks and Conditions – Answer the following questions about locks and conditions.

a. The type of lock we used in Java was called a ReentrantLock. Explain what a ReentrantLock is and how it is different from a lock that is no reentrant. **(1.0%)**

b. A condition must be associated with a lock, and before calling any methods on a condition, the lock associated with that condition must first be obtained. Explain why a lock must be obtained before a method on a condition associated with the lock can be called. **(1.0%)**

c. Describe a problem that could arise if a method on a condition was able to be called without first having the lock associated with it. **(1.0%)**

6. Semaphores – In the factory code, we used semaphores for ensuring that only a specific number of resources could be acquired before a worker would have to wait for more resources. This seems like it is essentially a counter.

a. Explain the difference between using a counter and using a semaphore for solving this problem. **(1.0%)**

b. Is it possible to use locks and conditions to get the same behavior as a semaphore? If so, explain how. If not, explain why not. **(1.0%)**

