CSE445/598 Distributed Software Development Quiz 2 Name: _____

1. Two threads try to acquire the same resource at the same time, and both are blocked. Then, they continually change their states in the same way and are continually blocked. This condition is called
   (A) deadlock. (B) livelock. (C) starvation. (D) deadlock avoidance.

2. A thread in a distributed program (**Select all that apply**)
   [a] is a synonym of a method. [b] exists when the corresponding code is running.
   [c] is a piece of code being executed. [d] exists after the hosting object is instantiated.

3. What type of values does the Unix system call fork( ) return?
   (A) double (B) int (C) unsigned int (D) string (E) void

4. Which system call in Unix operating system will copy the child process's code into the duplicate process?
   (A) execvp( ) (B) fork( ) (C) semaphore (D) signal( ) (E) wait( )

5. What state does not rely on an external event to put a Java thread back into the ready state?
   (A) "blocked" state. (B) "sleep" state. (C) "terminated" state. (D) "waiting" state.

6. When a Java thread executes a synchronized method, it will enter the "blocked" state if the thread
   (A) calls wait( ); (B) calls sleep( ); (C) calls notify( ); (D) accesses a locked object.
   (E) accesses a blocked thread.

7. What is the implication of a "synchronized method" in Java?
   (A) The method cannot be interrupted once it starts to run.
   (B) The objects being accessed by the method are locked until the method exits.
   (C) The order of the execution of all the synchronized methods is predefined.
   (D) A livelock of synchronized methods can never happen.
   (E) A deadlock of synchronized methods can never happen.

8. What does the C# method Monitor.PulseAll() do?
   (A) Move one thread into waiting state. (B) Move one thread in waiting state into ready state.
   (C) Move all threads into waiting state. (D) Move all threads in waiting state into ready state.

9. The C# method lock( ) is used for synchronizing
   (A) the entire method only, similar to the synchronized method in Java.
   (B) the entire class with multiple methods.
   (C) selected statements, similar to the synchronized statements in Java.
   (D) threads without blocking parallel reading to the same object.

10. What would happen if a "release" call is made when the semaphore count is at its max value?
    (A) An exception will occur. (B) The semaphore value will be increased by 1.
    (C) The calling thread is blocked. (D) The semaphore value will be decreased by 1.

11. How is a C# semaphore used for regulating the operating system's processes?
    (A) Use the same event name in all processes. (B) Use the same semaphore name in all processes

(C) Use different event names in all processes. (D) Use different semaphore names in all processes.

12. Event-driven programming is based on the assumption that the there
    (A) is a single processor in the system, (B) is a real-time computing engine in the system,
    (C) are multiple processors in the system, (D) is a fast polling mechanism in the system,

13. A C# delegate
    (A) replaces the inheritance mechanism in C++. (B) replaces the interface definition in C++.
    (C) replaces the polymorphic pointer in C++. (D) allows a method to be called recursively.
    (E) allows a method call to be associated with different methods.

14. The hyper-threading and the multi-core concepts are
    (A) synonym. (B) antonym.
    (C) both applied in processor design. (D) both applied in ALU design.

15. What is the best definition of the speedup of an N-core processor over a 1-core processor?
    (A) ExecutionTime of N-core / N (B) ExecutionTime of 1-core / ExecutionTime of N-core
    (C) N (D) N * ExecutionTime of 1-core

16. In a multithreading implementation of the Collatz conjecture, the efficiency exceeds 100%. The reason is
    (A) using more cores than permitted. (B) using better algorithms.
    (C) using uneven partition of input numbers. (D) using different array sizes in different programs.

17-20 Given the bufferClass between a producer and a consumer in Java. Answer the following questions.

17. What synchronization mechanism is used in the given program?
    (A) synchronized events (B) synchronized class
    (C) synchronized method (D) synchronized statements

18. What is the function of the variable “writeable”?
    (A) Define a lock operation on the object. (B) Define the order of accessing the object.
    (C) Define a semaphore of value 1. (D) Make the object for writing only.
    (E) The variable is not necessary because the synchronized keyword has been used.

19. The purpose of the call “notify( )” at line 12 is to
    (A) wait for the all child threads to terminate. (B) move itself from wait to ready state.
    (C) move a thread from sleep to ready state. (D) move itself from sleep to ready state.
    (E) move a thread from wait to ready state.

20. Consider the statements quoted by the synchronized structure. An interrupt can occur between
    (A) statements 5 and 8. (B) statements 9 and 10.
    (C) statements 11 and 12. (D) any two statements.
    (E) none of these statements.