Midterm #2: Stallings - Ch. 5 - Concurrency: Mutual Exclusion and Synchronization

1. **_____ are memory words used as a synchronization mechanism.**	Event flags
2. **_____ arises in thress different contexts: multiple applications, structured applications, and operating system structure.**	concurrency
3. **The classic concurrency problem that involves multiple readers that can read from a shared data when no single writer is exclusively writing to it is the _____ Problem.**	readers/writers
4. **In the case of competing processes three control problems must be faced: mutual exclusion, deadlock, and _____.**	starvation
5. **In the case of _____, messages are not sent directly from sender to reciever but rather are sent to a shared data structure consisting of queues that can temporarily hold messages.**	indirect addressing
6. **In the case of _____, processes are sharing resources without being aware of the other processes.**	competition
7. **A _____ is a data type that is used to block a process or thread until a particular condition is true.**	condition variable
8. **_____ is a function or action implemented as a sequence of one or more instructions that appears to be indivisible, no other process can see an intermediate or interrupt the operations.**	atomic operation
9. **A _____ is a mutual exclusion mechanism in which a process executes in an infinite loop waiting for the value of a lock variable to indicate availability.**	spinlock
10. **A _____ is an integer value used for signaling among processes.**	semaphore
11. **A _____ is a programming construct that encapsulates variables, access procedures, and initialization code within an ADT.**	monitor
12. **The _____ is a programming language construct that provides equivalent functionality to that of semaphores and is easier to control.**	monitor
13. **_____ is a section of code within a process that requires access to shared resources and that must not be executed while another process is in a corresponding section of code.**	critical section
14. **A _____ is a semaphore that takes on only the values of 0 an 1.**	binary semaphore
15. **_____ is when the sequence of instruction is guaranteed to execute as a group, or not execute at all, having no visible effect on system state.**	Atomic operation
16. **The management of multiple processes within a uniprocessor system is _____.**	multiprogramming
17. **A means for two processes to exchange information is with the use of _____.**	messages
18. **A monitor supports synchronization by the use of _____ that are contained within the monitor and accessible only within the monitor.**	condition variables
19. **A _____ occurs when multiple processes or threads read and write data items so that the final result depends on the order of execution of instructions in the multiple processes.**	race condition
20. **Only three operations may be performed on a semaphore: initialize, increment, and _____.**	decrement
21. **Probably the most useful combination, _____ allows a process to send one or more messages to many testinations as quickly as possible.**	nonblocking send, blocking receive
22. **A _____ relationship allows multiple server processes to provide concurrent service to multiple clients.**	many-to-many
23. **The requirement that when one process is in a critical section that accesses shared resources, no other process may be in a critical section that accesses any of those shared resources is _____.**	mutual exclusion
24. **A semaphore that does not specify the order in which processes are removed from the queue is a _____ semaphore.**	weak
25. **A semaphore whose definition includes the policy that the process that has been blocked the longest is released from the queue first is called a _____ semaphore.**	strong

26. **A situation in which a runnable process is overlooked indefinitely be the scheduler, although it is able to proceed, is _____.**	starvation
27. **A situation in which multiple threads or processes read and write a shared data item and the final result depends on the relative timing of their execution is a _____.**	race condition
28. **A situation where two+ processes are unable to proceed because each is waiting for one of the others to do something is a _____.**	deadlock
29. **The term _____ refers to a technique in which a process can do nothing until it gets permission to enter its critical section but continues to execute an instruction or set of inctructions that tests the appropriate variable to gain entrance.**	spin waiting
30. **True or False:** **A process that is waiting for access to a critical selection does not consume processor time.**	False
31. **True or False:** **As an extension of the principles of modular design and structured programming, some applications can be effectively programmed as a set of concurrent processes.**	True
32. **True or False:** **Atomicity guarantees isolation from concurret processes.**	True
33. **True or False:** **Concurrent processes do not come into conflict with each other when they are compering for the use of the same resource.**	False
34. **True or False:** **It is possible for one process to lock the mutex and for another to unlock it.**	False
35. **True or False:** **It is possible in a single-processor system to not only interleave the execution of multiple processes but also to overlap them.**	False
36. **True or False:** **One of the most common probelms faced in concurrent processing is the producer/consumer problem.**	True
37. **True or False:** **Processes need to be synchronized to enforce mutual exclusion.**	True
38. **True or False:** **Race condition is a situation in which two or more processes continuously change their states in response to changes in the other process(es) without doing any useful work.**	False
39. **True or False:** **The case of cooperation by sharing covers processes that interact with other processes without being explicitly aware of them.**	True
40. **True or False:** **The central themes of operating system design are all concerned with the management of processes of threads.**	True
41. **True or False:** **The functioning of a process, and the output it produces, must be independent of the speed at which is execution is carried out relative to the speed of the concurrent processes.**	True
42. **True or False:** **The sharing of main memory among processes is useful to permit efficient and close interaction among processes because such sharing does not lead to any problems.**	False
43. **True or False:** **Two or more processes can cooperate by means of simple signals, such that a process can be forced to stop at a specified place until it has received a specific signal.**	True
44. **True or False:** **When processes cooperate by communication, the various processes participate in a common effort that links all of the processes.**	True
45. **_____ was invented to allow processing time to be dynamically shared among a number of active applications.**	Multiprogramming