1. What is the difference between a variable and a constant?  
Option A: A variable can be changed, while a constant cannot.  
Option B: A constant can be changed, while a variable cannot.  
Option C: A variable is stored in memory, while a constant is stored on disk.  
Option D: A constant is stored in memory, while a variable is stored on disk.  
Correct Answer: A  
  
2. What is the purpose of an inheritance?  
Option A: To reuse code and reduce duplication.  
Option B: To increase the complexity of the program.  
Option C: To make the program more efficient.  
Option D: To make the program more secure.  
Correct Answer: A  
  
3. What is the difference between an interface and an abstract class?  
Option A: An interface defines methods without implementation, while an abstract class defines methods with implementation.  
Option B: An abstract class defines methods without implementation, while an interface defines methods with implementation.  
Option C: An interface cannot have any fields, while an abstract class can.  
Option D: An abstract class cannot have any fields, while an interface can.  
Correct Answer: A  
  
4. What is the purpose of a garbage collector?  
Option A: To clean up unused objects from memory.  
Option B: To prevent memory leaks.  
Option C: To improve the performance of the program.  
Option D: To reduce the size of the program.  
Correct Answer: A  
  
5. What is the difference between a stack and a queue?  
Option A: A stack is a Last-In First-Out (LIFO) data structure, while a queue is a First-In First-Out (FIFO) data structure.  
Option B: A queue is a Last-In First-Out (LIFO) data structure, while a stack is a First-In First-Out (FIFO) data structure.  
Option C: A stack can store any type of data, while a queue can only store integers.  
Option D: A queue can store any type of data, while a stack can only store integers.  
Correct Answer: A  
  
6. What is the purpose of a virtual method?  
Option A: To allow subclasses to override the implementation of a method.  
Option B: To prevent subclasses from overriding the implementation of a method.  
Option C: To increase the efficiency of the program.  
Option D: To reduce the size of the program.  
Correct Answer: A  
  
7. What is the difference between a checked and an unchecked exception?  
Option A: A checked exception is checked by the compiler, while an unchecked exception is not.  
Option B: An unchecked exception is checked by the compiler, while a checked exception is not.  
Option C: A checked exception can be handled by the program, while an unchecked exception cannot.  
Option D: An unchecked exception can be handled by the program, while a checked exception cannot.  
Correct Answer: A  
  
8. What is the purpose of a singleton class?  
Option A: To ensure that only one instance of a class can be created.  
Option B: To increase the complexity of the program.  
Option C: To make the program more efficient.  
Option D: To reduce the size of the program.  
Correct Answer: A  
  
9. What is the difference between a thread and a process?  
Option A: A thread is a lightweight process, while a process is a heavyweight thread.  
Option B: A process is a lightweight thread, while a thread is a heavyweight process.  
Option C: A thread shares memory with other threads in the same process, while a process has its own private memory space.  
Option D: A process shares memory with other processes, while a thread has its own private memory space.  
Correct Answer: C  
  
10. What is the purpose of a semaphore?  
Option A: To control access to shared resources.  
Option B: To prevent race conditions.  
Option C: To improve the performance of the program.  
Option D: To reduce the size of the program.  
Correct Answer: A  
  
11. What is the difference between a shallow copy and a deep copy?  
Option A: A shallow copy only copies the references to the objects, while a deep copy copies the actual objects.  
Option B: A deep copy only copies the references to the objects, while a shallow copy copies the actual objects.  
Option C: A shallow copy is more efficient than a deep copy.  
Option D: A deep copy is more efficient than a shallow copy.  
Correct Answer: A  
  
12. What is the purpose of a design pattern?  
Option A: To provide a reusable solution to a common problem.  
Option B: To increase the complexity of the program.  
Option C: To make the program more efficient.  
Option D: To reduce the size of the program.  
Correct Answer: A  
  
13. What is the difference between an eager and a lazy initialization?  
Option A: Eager initialization creates the object when the class is loaded, while lazy initialization creates the object when it is first used.  
Option B: Lazy initialization creates the object when the class is loaded, while eager initialization creates the object when it is first used.  
Option C: Eager initialization is more efficient than lazy initialization.  
Option D: Lazy initialization is more efficient than eager initialization.  
Correct Answer: A  
  
14. What is the purpose of a factory method?  
Option A: To create objects without specifying the exact class of the object.  
Option B: To increase the complexity of the program.  
Option C: To make the program more efficient.  
Option D: To reduce the size of the program.  
Correct Answer: A  
  
15. What is the difference between a static and a non-static method?  
Option A: A static method can be called without creating an instance of the class, while a non-static method cannot.  
Option B: A non-static method can be called without creating an instance of the class, while a static method cannot.  
Option C: A static method can access private data members of the class, while a non-static method cannot.  
Option D: A non-static method can access private data members of the class, while a static method cannot.  
Correct Answer: A  
  
16. What is the purpose of a try-catch block?  
Option A: To handle exceptions.  
Option B: To prevent exceptions from crashing the program.  
Option C: To improve the performance of the program.  
Option D: To reduce the size of the program.  
Correct Answer: A  
  
17. What is the difference between a parameter and an argument?  
Option A: A parameter is a variable in the method definition, while an argument is a value passed to the method when it is called.  
Option B: An argument is a variable in the method definition, while a parameter is a value passed to the method when it is called.  
Option C: A parameter can be of any type, while an argument must be of the same type as the parameter.  
Option D: An argument can be of any type, while a parameter must be of the same type as the argument.  
Correct Answer: A  
  
18. What is the purpose of a synchronized method?  
Option A: To ensure that only one thread can execute the method at a time.  
Option B: To prevent race conditions.  
Option C: To improve the performance of the program.  
Option D: To reduce the size of the program.  
Correct Answer: A  
  
19. What is the difference between an abstract class and an interface?  
Option A: An abstract class can have both abstract and non-abstract methods, while an interface can only have abstract methods.  
Option B: An interface can have both abstract and non-abstract methods, while an abstract class can only have abstract methods.  
Option C: An abstract class can have fields, while an interface cannot.  
Option D: An interface can have fields, while an abstract class cannot.  
Correct Answer: A  
  
20. What is the purpose of a deadlock?  
Option A: To prevent two or more threads from accessing the same resource at the same time.  
Option B: To allow two or more threads to access the same resource at the same time.  
Option C: To improve the performance of the program.  
Option D: To reduce the size of the program.  
Correct Answer: A  
  
21. What is the difference between a constructor and a method?  
Option A: A constructor is called when an object is created, while a method is called after an object is created.  
Option B: A method is called when an object is created, while a constructor is called after an object is created.  
Option C: A constructor can have any name, while a method must have a specific name.  
Option D: A method can have any name, while a constructor must have a specific name.  
Correct Answer: A  
  
22. What is the purpose of a final method?  
Option A: To prevent subclasses from overriding the method.  
Option B: To allow subclasses to override the method.  
Option C: To improve the performance of the program.  
Option D: To reduce the size of the program.  
Correct Answer: A  
  
23. What is the difference between a static and a non-static variable?  
Option A: A static variable is shared by all instances of the class, while a non-static variable is unique to each instance of the class.  
Option B: A non-static variable is shared by all instances of the class, while a static variable is unique to each instance of the class.  
Option C: A static variable can be accessed without creating an instance of the class, while a non-static variable cannot.  
Option D: A non-static variable can be accessed without