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| What is C++ | |
|  | C++ is created by Bjarne Stroustrup of AT&T Bell Labs as an extension of C, C++ is an object-oriented computer language used in the development of enterprise and commercial applications. Microsoft’s Visual C++ became the premier language of choice among developers and programmers. |

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| **2.** | What are the basic concepts of object oriented programming? |
|  | It is necessary to understand some of the concepts used extensively in object oriented programming.These include   * Objects * Classes * Data abstraction and encapsulation * Inheritance * Polymorphism * Dynamic Binding * Message passing |

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| **3.** | Define inheritance? |
|  | The mechanism of deriving a new class (derived) from an old class (base class) is called inheritance. It allows the extension and reuse of existing code without having to rewrite the code from scratch. Inheritance is the process by which objects of one class acquire properties of objects of another class. |

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| **4.** | Define polymorphism? |
|  | Polymorphism means one name, multiple forms. It allows us to have more than one function with the same name in a program.It allows us to have overloading of operators so that an operation can exhibit different behaviours in different instances. |

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| **5.** | What is encapsulation? |
|  | The wrapping up of data and functions into a single unit (called class) is known as encapsulation. Encapsulation containing and hiding information about an object, such as internal data structures and code. |

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| **6.** | What is message passing? |
|  | An object oriented program consists of a set of objects that communicate with each other. Message passing involves specifying the name of the object, the name of the function and the information to be sent. |

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| **7.** | What are tokens in C++? |
|  | The smallest individual units of a program is known as tokens. c++ has the following tokens :   * Keywords * Identifiers * Constants * Strings * Operators |

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| **8.** | What is the use of enumerated data type? |
|  | An enumerated data type is another user defined type which provides a way for attaching names to numbers thereby increasing comprehensibility of the code. The enum keyword automatically enumerates a list of words by assigning them values 0,1,2, and so on. |

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| **9.** | What is the use of default constructor? |
|  | A constructors that accepts no parameters is called the default constructor.If no user-defined constructor exists for a class A and one is needed, the compiler implicitly declares a default parameterless constructor A::A(). This constructor is an inline public member of its class. The compiler will implicitly define A::A() when the compiler uses this constructor to create an object of type A. The constructor will have no constructor initializer and a null body. |

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| **10.** | Define Constructors? |
|  | A constructor is a member function with the same name as its class. The constructor is invoked whenever an object of its associated class is created.It is called constructor because it constructs the values of data members of the class. |

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| ow variable declaration in c++ differs that in c? | |
|  | C requires all the variables to be declared at the beginning of a scope but in c++ we can declare variables anywhere in the scope. This makes the programmer easier to understand because the variables are declared in the context of their use. |

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| **12.** | Define destuctors? |
|  | A destructor is called for a class object when that object passes out of scope or is explicitly deleted.A destructors as the name implies is used to destroy the objects that have been created by a constructors.Like a constructor , the destructor is a member function whose name is the same as the class name but is precided by a tilde. |

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| **13.** | What is a class? |
|  | A class is a collection of objects. |

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| **14.** | what is the difference between c &c++? |
|  | c++ ia an object oriented programing but c is a procedure oriented programing.c is super set of c++. c can't suport inheritance,function overloading, method overloading etc. but c++ can do this.In c-programe the main function could not return a value but in the c++ the main function shuld return a value. |

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| **15.** | What is copy constructor? |
|  | Copy constructor is a constructor function with the same name as the class and used to make deep copy of objects. |

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| **16.** | What is default constructor? |
|  | A default constructor is a constructor that either has no parameters, or if it has parameters, all the parameters have default values. |

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| **17.** | What is a scope resolution operator? |
|  | The scope resolution operator permits a program to reference an identifier in the global scope that has been hidden by another identifier with the same name in the local scope. |

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| **18.** | What is the difference between Object and Instance? |
|  | An instance of a user-defined type is called an object. We can instantiate many objects from one class. An object is an instance of a class. |

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| **19.** | What is the difference between macro and iniine? |
|  | Inline follows strict parameter type checking, macros do not. Macros are always expanded by preprocessor, whereas compiler may or may not replace the inline definitions. |

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| **20.** | How variable declaration in c++ differs that in c? |
|  | C requires all the variables to be declared at the beginning of a scope but in c++ we can declare variables anywhere in the scope. This makes the programmer easier to understand because the variables are declared in the context of their use. |

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| **21.** | What is multiple inheritance? |
|  | A class can inherit properties from more than one class which is known as multiple inheritance. |

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| **22.** | what is the use of virtual destructor in c++? |
|  | A destructor is automatically called when the object is destroyed. A virtual destructor in C++ is used primarily to prevent resource leaks by performing a clean-up of the object. |

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| **23.** | What do you mean by reference variable in c++? |
|  | A reference variable provides an alias to a previously defined variable. Data -type & reference-name = variable name |

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| **24.** | What do you mean by implicit conversion? |
|  | * Whenever data types are mixed in an expression then c++ performs the conversion automatically. * Here smaller type is converted to wider type. * Example : in case of integer and float integer is converted into float type. |

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| **25.** | What are virtual functions? |
|  | * The virtual fuctions must be members of some class. * They cannot be static members. * They are accessed by using object pointers. * A virtual function can be a friend of another class. |

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| **26.** | What is the difference between class and structure? |
|  | * By default, the members ot structures are public while that tor class is private. * structures doesn’t provide something like data hiding which is provided by the classes. * structures contains only data while class bind both data and member functions. |

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| **27.** | What are storage qualifiers in C++ ? |
|  | *Const*Keyword indicates that memory once initialized, should not be altered by a program. *Volatile* keyword indicates that the value in the memory location can be altered even though nothing in the program. *Mutable* keyword indicates that particular member of a structure or class can be altered even if a particular structure variable, class, or class member function is constant. |

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| **28.** | What is virtual class and friend class? |
|  | Friend classes are used when two or more classes and virtual base class aids in multiple inheritance. Virtual class is used for run time polymorphism when object is linked to procedure call at run time. |

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| **29.** | what is an abstract base class? |
|  | An abstract class is a class that is designed to be specifically used as a base class. An abstract class contains at least one pure virtual function. |

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| **30.** | What is dynamic binding? |
|  | Dynamic binding (also known as late binding) means that the code associated with a given procedure call is not known until the time of the call at run time.It is associated with polymorphism and inheritance. |

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| **1.** | what is difference between function overloading and operator overloading? |
|  | A function is overloaded when same name is given to different function. While overloading a function, the return type of the functions need to be the same. |

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| **32.** | What are the advantages of inheritance? |
|  | * Code reusability * Saves time in program development. |

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| **33.** | What is a dynamic constructor? |
|  | The constructor can also be used to allocate memory while creating objects. Allocation of memory to objects at the time of their construction is known as dynamic construction of objects.The memory is allocated with the help of the new operator. |

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| **34.** | What is the difference between an Array and a List? |
|  | The main difference between an array and a list is how they internally store the data. whereas Array is collection of homogeneous elements. List is collection of heterogeneous elements. |

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| **35.** | What is the use of ‘using’ declaration? |
|  | A using declaration makes it possible to use a name from a namespace. |

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| **36.** | What is the difference between a template class and class template? |
|  | **Template class**A generic definition or a parameterized class not instantiated until the client provides the needed information. It’s jargon for plain templates. **Class template***A class template specifies how individual classes can be constructed much like the way a class specifies how individual objects can be constructed. It’s jargon for plain classes.* |

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| **37.** | What is friend function? |
|  | The function declaration should be preceded by the keyword friend.The function definitions does not use either the keyword or the scope operator ::. The functions that are declared with the keyword friend as friend function.Thus, a friend function is an ordinary function or a member of another class. |

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| **38.** | What is a scope resolution operator? |
|  | A scope resolution operator (::), can be used to define the member functions of a class outside the class. |

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| **39.** | What do you mean by pure virtual functions? |
|  | A pure virtual member function is a member function that the base class forces derived classes to provide. Any class containing any pure virtual function cannot be used to create object of its own type. |

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| **40.** | What is a conversion constructor? |
|  | A converting constructor is a single-parameter constructor that is declared without the function specifier explicit. The compiler uses converting constructors to convert objects from the type of the first parameter to the type of the converting constructor’s class. |

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| **41.** | What is a container class? What are the types of container classes? |
|  | A container class is a class that is used to hold objects in memory or external storage. A container class acts as a generic holder. A container class has a predefined behavior and a wellknown interface. A container class is a supporting class whose purpose is to hide the topology used for maintaining the list of objects in memory. When a container class contains a group of mixed objects, the container is called a heterogeneous container; when the container is holding a group of objects that are all the same, the container is called a homogeneous container. |

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| **42.** | What is Associative container? |
|  | Associative containers are designed to support direct access to elements using keys. They are not sequential. There are four types of associatives containers :   * Set * Multiset * Map * Multimap |

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| **43.** | What is an iterator? |
|  | Iterators are like pointers. They are used to access the elements of containers thus providing a link between algorithms and containers. Iterators are defined for specific containers and used as arguments to algorithms. |

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| **44.** | What are the defining traits of an object-oriented language? |
|  | The defining traits of an object-oriented langauge are :   * Encapsulation * Inheritance * Polymorphism |

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| **45.** | Name some pure object oriented languages? |
|  | * Smalltalk * Java * Eiffel * Sather |

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| **46.** | What is this pointer? |
|  | It is a pointer that points to the current object. This can be used to access the members of the current object with the help of the arrow operator. |

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| **47.** | What is encapsulation? |
|  | Encapsulation (or information hiding) is the process of combining data and functions into a single unit called class. |

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| **48.** | What is problem with Runtime type identification? |
|  | The run time type identification comes at a cost of performance penalty. Compiler maintains the class. |

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| **49.** | What are the differences between new and malloc? |
|  | * New initializes the allocated memory by calling the constructor. Memory allocated with new should be released with delete. * Malloc allocates uninitialized memory. * The allocated memory has to be released with free.new automatically calls the constructor while malloc(dosen’t) |

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| **50.** | What is conversion operator? |
|  | You can define a member function of a class, called a conversion function, that converts from the type of its class to another specified type. |

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| **51.** | What is difference between template and macro? |
|  | A template can be used to create a family of classes or function.A template describes a set of related classes or set of related functions in which a list of parameters in the declaration describe how the members of the set vary. Identifiers that represent statements or expressions are called macros. |

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| **52.** | What is reference? |
|  | Reference is a name that acts as an alias, or alternative name, for a previously defined variable or an object. |

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| **53.** | What are the access specifier in c++? |
|  | There are three types of access specifier in c++ . They are   * Public * protected * private |

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| **54.** | What is difference between C++ and Java? |
|  | * C++ has pointers Java does not. * Java is the platform independent as it works on any type of operating systems. * java has no pointers where c ++ has pointers. * Java has garbage collection C++ does not. |

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| **55.** | What is namespace? |
|  | The C++ language provides a single global namespace.Namespaces allow to group entities like classes, objects and functions under a name. |

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| **56.** | What is an explicit constructor? |
|  | A conversion constructor declared with the explicit keyword. The compiler does not use an explicit constructor to implement an implied conversion of types. It’s purpose is reserved explicitly for construction.Explicit constructors are simply constructors that cannot take part in an implicit conversion. |

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| **57.** | What is the use of storage class specifiers? |
|  | A storage class specifier is used to refine the declaration of a variable, a function, and parameters. The following are storage class specifiers :   * auto * register * static * extern |

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| **58.** | what is assignment operator in c++? |
|  | Default assignment operator handles assigning one object to another of the same class. Member to member copy (shallow copy). |

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| **59.** | Can destructor be private? |
|  | Yes destructors can be private. But according it is not advisable to have destructors to be private. |

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| **60.** | What is strstream? |
|  | stringstream provides an interface to manipulate strings as if they were input/output streams. ‹ strstream› to define several classes that support iostreams operations on sequences stored in an allocated array of char object. |

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| **61.** | What are the types of STL containers? |
|  | * deque * hash map * hashmultimap * hash\_multiset * hashset * list * map * multimap * multiset * set * vector   . |

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| **62.** | What is the difference between method overloading and method overriding? |
|  | **Overloading** a method (or function) in C++ is the ability for functions of the same name to be defined as long as these methods have different signatures (different set of parameters). **Method overriding** is the ability of the inherited class rewriting the virtual method of the base class. |

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| **63.** | What do you mean by inline function? |
|  | An inline function is a function that is expanded inline when invoked.ie. the compiler replaces the function call with the corresponding function code. An inline function is a function that is expanded in line when it is invoked. That is the compiler replaces the function call with the corresponding function code (similar to macro). |

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| **64.** | What is a template? |
|  | A template can be used to create a family of classes or function.A template describes a set of related classes or set of related functions in which a list of parameters in the declaration describe how the members of the set vary. |

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| **65.** | What is a copy constructor and when is it called? |
|  | A copy constructor is a method that accepts an object of the same class and copies it members to the object on the left part of assignement. |

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| **66.** | What is the difference between a copy constructor and an overloaded assignment operator? |
|  | A copy constructor constructs a new object by using the content of the argument object. An overloaded assignment operator assigns the contents of an existing object to another existing object of the same class. |

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| **67.** | What is a virtual destructor? |
|  | The simple answer is that a virtual destructor is one that is declared with the virtual attribute. |

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| **68.** | What do you mean by Stack unwinding? |
|  | It is a process during exception handling when the destructor is called for all local objects between the place where the exception was thrown and where it is caught. |

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| **69.** | What is STL? and what are the components of stl? |
|  | A collection of generic classes and functions is called as Standard Template Library (STL).The stl components are   * containers * Algorithm * Iterators   . |

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| **70.** | What is a modifier? |
|  | A modifier, also called a modifying function is a member function that changes the value of at least one data member. In other words, an operation that modifies the state of an object. Modifiers are also known as mutators. |

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| **71.** | What is an adaptor class or Wrapper class? |
|  | A class that has no functionality of its own. Its member functions hide the use of a third party software component or an object with the non-compatible interface or a non-objectoriented implementation. |

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| **72.** | What is a Null object? |
|  | It is an object of some class whose purpose is to indicate that a real object of that class does not exist. One common use for a null object is a return value from a member function that is supposed to return an object with some specified properties but cannot find such an object. |

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| **73.** | What is class invariant? |
|  | A class invariant is a condition that defines all valid states for an object. It is a logical condition to ensure the correct working of a class. Class invariants must hold when an object is created, and they must be preserved under all operations of the class. In particular all class invariants are both preconditions and post-conditions for all operations or member functions of the class. |

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| **74.** | What is the difference between the message and method? |
|  | **Message** : *Objects communicate by sending messages to each other.A message is sent to invoke a method.* **Method** : *Provides response to a message and it is an implementation of an operation.* |

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| **75.** | How can we access protected and private members of a class? |
|  | In the case of members protected and private, these could not be accessed from outside the same class at which they are declared. This rule can be transgressed with the use of the friend keyword in a class, so we can allow an external function to gain access to the protected and private members of a class. |

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| **76.** | What do you mean by late binding? |
|  | Late binding refers to function calls that are not resolved until run time. Virtual functions are used to achieve late binding. When access is via a base pointer or reference, the virtual function actually called is determined by the type of object pointed to by the pointer. |

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| **77.** | What is virtual function? |
|  | A virtual function is a member function that is declared within a base class and redefined by a derived class .To create a virtual function, the function declaration in the base class is preceded by the keyword virtual. |

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| **78.** | What do you mean by early binding? |
|  | Early binding refers to the events that occur at compile time. Early binding occurs when all information needed to call a function is known at compile time. Examples of early binding include normal function calls, overloaded function calls, and overloaded operators. The advantage of early binding is efficiency. |

**What is the difference between a NULL pointer and a void pointer?**  
**Ans:** A NULL pointer is a pointer of any type whose value is zero. A void pointer is a pointer to an object of an unknown type, and is guaranteed to have enough bits to hold a pointer to any object. A void pointer is not guaranteed to have enough bits to point to a function (though in general practice it does).

**. What is difference between C++ and Java?**  
**Ans:** C++ has pointers Java does not.  
Java is platform independent C++ is not.  
Java has garbage collection C++ does not.

**. What do you mean by multiple inheritance in C++ ?**  
**Ans:** Multiple inheritance is a feature in C++ by which one class can be of different types. Say class teaching Assistant is inherited from two classes say teacher and Student.

**What do you mean by virtual methods?**  
**Ans:** virtual methods are used to use the polymorphism feature in C++. Say class A is inherited from class B. If we declare say function f() as virtual in class B and override the same function in class A then at runtime appropriate method of the class will be called depending upon the type of the object.

**What do you mean by static methods?**  
**Ans:** By using the static method there is no need creating an object of that class to use that method. We can directly call that method on that class. For example, say class A has static function f(), then we can call f() function as A.f(). There is no need of creating an object of class A.

**How many ways are there to initialize an int with a constant?**  
**Ans:** Two.  
There are two formats for initializers in C++ as shown in the example that follows. The first format uses the traditional C notation. The second format uses constructor notation.  
int foo = 123;  
int bar (123);

**What is a constructor?**  
**Ans:** Constructor is a special member function of a class, which is invoked automatically whenever an instance of the class is created. It has the same name as its class.

**What is destructor?**  
**Ans:** Destructor is a special member function of a class, which is invoked automatically whenever an object goes out of the scope. It has the same name as its class with a tilde character prefixed.

**What is an explicit constructor?**  
**Ans:** A conversion constructor declared with the explicit keyword. The compiler does not use an explicit constructor to implement an implied conversion of types. It’s purpose is reserved explicitly for construction.

**What is the Standard Template Library?**  
**Ans:** A library of container templates approved by the ANSI committee for inclusion in the standard C++ specification. A programmer who then launches into a discussion of the generic programming model, iterators, allocators, algorithms, and such, has a higher than average understanding of the new technology that STL brings to C++ programming.