

CS304-Object Oriented programming NEW Solved Final terms papers with

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Q) Describe the way to declare a template function as a friend of any class?(2marks)

Answer:- (Page 294)

```
Template<class U>
Void doSomething (U);
Template<class V>;
Class A{
int data;
};
Template<class T>
Class B{
int data;
friend void doSomething(T);
friend A<T>;
```

};

Q) Give the C++ code of template function to print the values of any type of array I int.this function will take 2 parameters one will be pointer and other will be size of array (mrk3)

Answer:- (Page 257)

```
Template<class T>
Void printArray(T*array,int size)
{
For(int i=0;i<size;i++)
Cout<<array[i];
int main()
int iArray[5]={1,2,3,4,5};
void printArray(iArray,5);
return 0;
}
```

Q) Consider the code below,

```
1. template<typename T> class Test {  
2. T value;  
3. public:  
  
1. Test( T val ) : value(val){}  
  
1. Test(const Test<T>& c) : value(c.value) {}  
  
1. };  
  
1. int main() {  
2. Test< int > t1( 0 ), t2( 0 );  
3. Test< float > t3 = t1;  
4. system("PAUSE");  
5. return 0;  
6. }
```

Q) Give line number having any error/errors in this code explain the reason for error/s and give corrected code as well.

Answer:

```
Test< float > t3 = t1;
```

There is an error in this line due to conversion from int to float but in a wrong way

Q) Why Abstract class's objects cannot be instantiated?

Answer:- (Page 230)

Abstract class's objects cannot be instantiated they are used for inheriting interface or implementation so that derived classes can give implementation of these concepts.

Q) What output is produced by the following code?

```
int wait_time=46;
try
{
cout "Try-block entered.\n";
    if (wait_time > 30)
        throw wait_time;
    cout "Leaving try-block.\n";
}

catch ( int thrown_value)
{
cout "Exception thrown with\n""wait_time equal to "thrown_valueendl;
}

cout "After catch-block" endl;
```

Q) Write C++ code for the overloaded subscript operator of following template Vector class.

Answer:

```
template< class T >

class Vector {

private:

    T* ptr;
```

```
int size;
```

```
int index;
```

```
public:
```

```
T& operator [](int); // overloaded subscript operator
```

```
};
```

Q) What do you mean by Stack unwinding?

Answer: - pg 336

The flow control (the order in which code statements and function calls are made) as a result of throw statement is referred as “stack unwinding”

It takes place in two ways.

Q) Write general syntax of nested try catch block?

Answer:- pg 344

```
int main()
```

```
{
```

```
try{
```

```
try{
```

```
throw 1;
```

```
}  
  
catch (float) {}  
  
}  
  
catch(int){  
  
}  
  
return 0;  
  
}
```

Q (Marks: 3) Consider the code below, `template< typename T > class T1 { public: T i; protected: T j; private: T k; friend void Test(); }`; This code has a template class T1 with three members i,j and k and a friend function Test(), you have to describe which member/s of T1 will be available in function Test().

Answer:- All of them (i, j, k) will be available in function Test().

**Q) In which situation do we need to implement Virtual inheritance?
Explain with an example (5 marks)**

Answer:-

In multiple inheritance while solving diamond problem virtual inheritance need to implement. The solution of avoid this problem is virtual inheritance so that in multiple inheritance only one copy of base class is generated as shown below instead of two

separate copies. In virtual inheritance there is exactly one copy of the anonymous base class object

```
class Vehicle{
protected:
int weight;
};
class LandVehicle :
public virtual Vehicle{
};
class WaterVehicle :
public virtual Vehicle{
};
```

Example

```
class AmphibiousVehicle:
public LandVehicle,
public WaterVehicle{
public:
AmphibiousVehicle(){
weight = 10;
}
```

2mark Questions:

Q) Write down a list of four intangible objects?

Answer (page no 13)

- Hours
- Seconds
- Minutes
- Year
- Month

Q) Write three important features of virtual functions?

Answer (page no230)

- 1) Virtual function achieve exactly same kind of functionality that can be achieved by complex code of switch statement
- 2) Target class of a virtual function call is determined at run-time automatically
- 3) In C++ we declare a function virtual by preceding the function header with keyword “virtual”

Q) Give the C++ code of template function to print the values of any type of array I int. This function will take 2 parameters one will be pointer and other will be will be size of array?

Repeated

3 MARK QUESTIONS:

Q) Describe the salient feature of abstract class?

Answer (page no 36)

They are present at or near the top in the class hierarchy to present most generalized behavior

Main purpose is to be inherited by other classes

Cannot be instantiated

Promotes reuse

Q) Define composition and give its example with coding?

Answer (page no 124)

If one object is part of another object(relationship of part and whole)in composition lifetime of one object depends upon the other. The part objects are essential components of the whole.

For example: person is composed of eyes, feet etc,

Q) Define static and dynamic binding?

Answer (page no 231)

Static binding: means that target function for a call is selected at compile time.

Dynamic binding: means that target function for a call is selected at run time.

Q) What is constructor?

Answer (page no 178)

5 mark Questions:

Q) What is the difference (if any) between the two types of function declarations?

template function_declaration;

template function_declaration;

Q) Give three advantages that Iterators provide over Cursors?

Answer (page no 315)

- With iterators more than one traversal can be pending on a single container
- It allow to change the traversal strategy without changing the aggregate object
- They contribute towards data abstraction by emulating pointers.

Q) What are container requirements?

Answer (page no323)

Q) What is random iterator? What is its relation with vectors?

Answer (page no 325)

They have all the capabilities of bidirectional iterators plus they can directly access any elements of a container.

Relation with vector:

As we can access any element of vector using its index so we can use random access iterator

2 MARK QUESTIONS:

Q) Give two uses of a destructor?

- It can be used to create class object without passing any argument.
- It is called destructor is called before the base class destructor is called
- It is also used to release the memory after it is used...

Q) What is the purpose of template parameter?

Answer (repeated)

Q) Give the names of three ways to handle errors in a program?

Answer (page no355)

1. Abnormal termination
2. Graceful termination
3. Return the illegal value
4. Return error code from function
5. Exception handling

3 MARK QUESTIONS:

Q) Describe the way to declare a template class as a friend class of any other class?

Answer (repeated)

Q) What is the purpose of template parameter?

Ans: There are three kinds of template parameters: • type • non-type • template You can interchange the keywords class and typename in a template parameter declaration. You cannot use storage class specifiers (static and auto) in a template parameter declaration.

Q) What is meant by direct base class?

Answer (page no 212)

Direct base class is called explicitly listed in a derived class's header with a colon (:)

Example:

```
Class child: public Parent 1 {  
};
```

Q) State any conflict that may rise due to multiple inheritances?

Answer (page no251)

If more than one base class has a function with same signature then the child will have two copies of the function.

Calling such function will result in ambiguity.

5 MARK QUESTIONS:

Q) Suppose the base class and the derived class each have a member function with the same signature. When you have a pointer to a base class object and call a function member through the pointer, discuss what determines which function is actually called, the base class member function or the derived-class function

Repeated

Q) What are container requirements?

Repeated

Q) Tell the logical error/s in the code given below with reference to resource management; also describe how we can correct that error/s.

```
class Test{
public:
int function1(){
    try{
        FILE *fileptr = fopen("filename.txt","w");
        throw exception();
        fclose(fileptr);
        return 0;
    }
}
```

```
        catch(Exception e){
            ...
        }
    }
};
```

Answer (page no349)

In case of exception the call to fclose will be ignored and file will remain opened.

Solution:

```
class Test{
public:
int function1(){
    try{
        FILE *fileptr = fopen("filename.txt","w");
        fwrite("Hello world",1,11,fileptr);
        ....
        throw exception();
        fclose(fileptr);
    }catch(Exception e){
        fclose(fileptr);
        throw;
    }
    return 0;
}
```

We can also make a separate class files handling to open file and destructor to close it...

Q) In which situation do we need to implement Virtual inheritance? Explain with an example?

Answer (page no 257)

It must be used when necessary. It can be used in the situations when programmer wants to use two distinct data members inherited from base class rather than one..

Example:

Class Vehicle {

```
Protected: int weight;  
};  
Class LandVehicle: public virtual Vehicle {  
};  
Class WaterVehicle: public virtual Vehicle {  
};  
Class AmphibiousVehicle: public LandVehicle, WaterVehicle {  
Public: AmphibiousVehicle () {  
Weight=10;  
}  
};
```

2 MARK QUESTIONS:

Q) Write three important features of virtual functions

Repeated

Q) Give the name of three operation that a cursor or iterate generally provide?

Answer (page no313)

- T*first()
- T*beyond()
- T*next(T*)

Q) What do you know about function Template? Answer in two line?

Answer (page no259)

It is also called generic programming for a particular data type...Its major benefits are reusability ,writability,Maintainability...In c++ generic programming is done by using template..it is of two types: Function and Class templates

Q) What is a Virtual Destructor?

Answer(page no 236)

The destructor is called according to static type of any class pointer

For example: if we have saved derived class pointer in base class pointer we will call destructor using delete operator the destructor of base class will be called as static type .This will destroy the base class object and derived class will not so we will use virtual destructor to call derived class destructor too ..

Virtual~Shape()//call to destructor

3 MARK QUESTIONS:

Q) Define static and dynamic binding.

Repeated

Q) What are container requirements?

When an element is inserted into a container a copy of that element is made using

- Copy and assignment Operator

Associative container and many algorithms compare elements so the elements that are added to associative containers should have this functionality,

- Operator ==
- Operator<=

Q) Sort data in the order in which compiler searches a function. Complete specialization, generic Template, Partial specialization, Ordinary function.?

Q) What is constructor?

Repeated

5 MARK QUESTIONS:

Q) Describe problems with multiple inheritances?

Repeated

Q) Consider the code below,

```
template< typename T >
```

```
class T1 {
```

```
    public:
```

```
        T i;
```

```
    protected:
```

```
        T j;
```

```
private:
```

```
    T k;
```

```
    friend void Test();
```

```
};
```

This code has a template class T1 with three members i,j and k and a friend function Test(), you have to Describe which member/s of T1 will be available in function Test ().

Repeated.

Q) Give the c++ code of case sensitive comparison function of string class

Answer (page no 266)

Q) Write the average function that returns the average of all the element of an array. The argument to the function should be array name and the size of the array (type int)

2 MARKS QUESTIONS:

Q) Describe the way to declare template class as a friend of any other class?

Repeated.

Q) Explain statement below

Vector ivec (4, 3);

Answer (not sure)

Vector is the class name ivec is the object of it and it is taking array values for class vector

Q) You are required to list down default access specifier for c++ class and c structure?

Answer (page no 69)

Public, Private and Protected...

Q) State two reasons why virtual method cannot be static?

No, because it doesn't make any sense in C++.

Virtual functions are invoked when you have a pointer/reference **to an instance** of a class. Static functions aren't tied to a particular instance, they're tied to a class. C++ doesn't have pointers-to-class, so there is no scenario in which you could invoke a static function virtually

In C++, a *static* member function of a class cannot be *virtual*. For example, below program gives compilation error.

```
#include<iostream>

using namespace std;

class Test
{
    public:
        // Error: Virtual member functions cannot be static
        virtual static void fun() { }
};
```

3 MARKS QUESTIONS.

Q) Describe three properties necessary for a container to implement generic algorithm?

Answer (not sure)

- Vector
- Deque
- List

Q) In both virtual inheritance and multiple inheritance copy/copies of base class are created, List down how many copy/copies are created for:

Virtual inheritance

Multiple inheritances

Ans:Copies: Virtual: Only one copy from any one parent is created. Multiple: Copies from both the parents are created.

Q) Do you think that encapsulation is used to cope with complexity and simplifies the model and provide better understands? Explain the said perceptively with one real word example.

Repeated

Q) Describe the way to declare a template class as a friend class of any other class?

Repeated

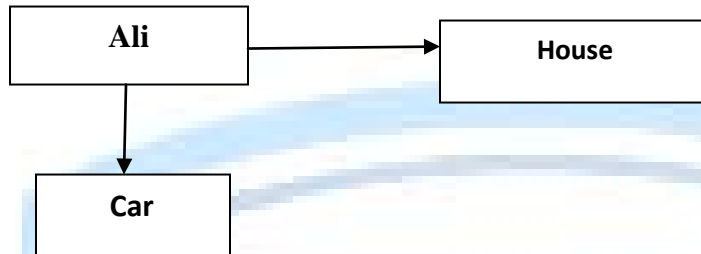
Q) Give the name of two basic types of contains collectively called first class container?

Answer (page no 321)

Associative and Sequence containers are collectively referred to as the first-class container.

Q) Show that OO model deals with the same entities /objects as they exist in a particular domain or in a particular real situation word use example of Ali derives a car?

The models are used to understand the problem before starting developing it



Ali lives in house

Ali drives the car

Q) In which situation we should use operator overloading and in which situation we should use Templates?

Answer (page no 265)

Template is used when to have exactly identical operations on different data types where as overloading is used when we have similar operations on different data types.

Q) Write a Template Function that takes one Template parameter and always returns value that is equal to double of its parameter value (Parameter *2)?

Q) Write down the Advantages of Constructor and destructors in respect of class with no dynamic data members?? 3 marks

Q) Give the general syntax of nested try catch blocks? 3 marks

Repeated

Q) Write C++ code to overload the subscript [] operator for string class? 5 marks

Answer(page no 164)

Q) Write a template function that returns the average of all the elements of an array the argument to the function should be the array name and the size of array type (Type int)? 5 marks

Repeated

Q) Write the C++ code for the overloading subscript operator of following template vectors? 5marks

Repeated

Q) How we can set the default values for non-type parameters?

Answer (page no 288)

We can set default value for non-type parameters, as we do for parameters passed in ordinary functions,

Q) Give the name of two templates?

Answer:

Function and class templates

Q) Give one advantage and disadvantage of templates?

Answer:

Advantage

Reusability

Disadvantage:

Can consume memory if used without care

Q) Name any two error handling techniques?

Answer: Abnormal and Graceful termination

Q) Describe two key components of STL?

Answer

- Containers
- Iterators

Q) How we can make constructors virtual?

Answer

We can make constructors virtual by placing the key word Virtual at the start of their name in base class and derived class

For example:

We have a class of Shape which takes a function draw constructor virtual

```
Class Shape{
```

```
Public:
```

```
Shape();
```

```
Virtual void draw()// call to structure which is virtual
```

};

Q) What is the Role of static data members?

Answer (page no189)

The type that is used to destroy a reference or pointer is called its static type

Student s;

The static type of s is Student.

Q) What is the difference between Iterators and Cursors?

an iterator allows iteration of a container with no knowledge of the container itself. A cursor, on the other hand, allows iteration of a container as well but has implementation details specific to the container type, so it does keep a reference to the container. Additionally a cursor's interface mirrors the interface of the container kind of like the facade pattern.

Q) Write the average function that returns the average of all the element of an array. The argument to the function should be array name and the size of the array (type int)

Ans:

Average Function: double avg_of_Array (const int Array[], const int size)

```
{  
int sum = Array[0];  
for( int i = 1; i < size; i++ )  
sum += Array[ i ];  
return ( sum / size );  
}
```

Q) Write a Template Function that takes one Template parameter and always returns value that is equal to double of its parameter value (Parameter *2)?

Ans:

Template Function: `template < typename T >`

`T return_Double(const T number)`

`{`

`return (number * 2);`

`}`