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NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » **Programming in C++ (course)**[Announcements \(announcements\)](#) **[About the Course \(preview\)](#)** [Ask a Question \(forum\)](#)[Progress \(student/home\)](#) [Mentor \(student/mentor\)](#)

Unit 9 - Week 7

Course outline

How does an
NPTEL online
course work?

Week 0

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

- ☐ Module 31 :
Virtual Function
Table (Lecture
46) (unit?
unit=80&lesson=81)

Assignment 7

The due date for submitting this assignment has passed.

Due on 2020-11-04, 23:59 IST.

Assignment submitted on 2020-11-04, 19:31 IST

1)

2 points

Module 32 : Type Casting and Cast Operators : Part I (Lecture 47) (unit? unit=80&lesson=82)

Module 33 : Type Casting and Cast Operators : Part II (Lecture 48) (unit? unit=80&lesson=83)

Module 34 : Type Casting and Cast Operators : Part III (Lecture 49) (unit? unit=80&lesson=84)

Module 35 : Multiple Inheritance (Lecture 50) (unit? unit=80&lesson=85)

Module 35 : Multiple Inheritance (Contd.) (Lecture 51) (unit? unit=80&lesson=86)

Lecture Materials (unit? unit=80&lesson=87)

Quiz : Assignment 7 (assessment? name=170)

W7_Programming-Qs1 (/noc20_cs57/progassignment? name=171)

W7_Programming-Qs2 (/noc20_cs57/progassignment? name=172)

W7_Programming-Qs3 (/noc20_cs57/progassignment? name=173)

Consider the program below.

```
#include <iostream>
#include <string>
using namespace std;

class employee {
    int emp_id;
    string name;
public:
    employee(int _emp_id, string _name) : emp_id(_emp_id), name(_name) { }

    void update(int id, string na) const {
        (_____) -> emp_id = id;    // LINE-1
        (_____) -> name = na;    // LINE-2
    }

    void showInfo() const {
        cout << emp_id << " : " << name;
    }
};

int main() {
    const employee e(3, "Raj");

    e.update(30, "Rajan");
    e.showInfo();

    return 0;
}
```

Fill in the blank at LINE-1 and LINE-2 such that the output is: 30 : Rajan

- ☒ a) const_cast <employee*> (this)
- ☐ b) static_cast <employee*> (this)
- ☐ c) dynamic_cast <employee*> (this)
- ☒ d) ((employee*) (this))

Yes, the answer is correct.
Score: 2

Accepted Answers:

- a) const_cast <employee*> (this)
- d) ((employee*) (this))

2)

2 points

● W7_Programming-
Qs4
(/noc20_cs57/progassignm
name=174)

○ Feedback For
Week 7 (unit?
unit=80&lesson=88)

Week 8

DOWNLOAD VIDEOS

Text Transcripts

Assignment Solution

Books

Live Interactive Session

Programming Test
(11th Dec):
Session-1
(10.00AM -
11.00AM)

Programming Test
(11th Dec):
Session-2 (8.00PM
- 9.00PM)

Consider the program below.

```
#include <iostream>
using namespace std;

class Base {
    int data;
public:
    Base() { cout << "Base()" << " "; }
    Base(int _x) { cout << "Base(x)" << " "; }
};

class Derived1 : virtual public Base {
public:
    Derived1() { cout << "Derived1()" << " "; }
    Derived1(int _x) : Base(_x) { cout << "Derived1(x)" << " "; }
};

class Derived2 : virtual public Base {
public:
    Derived2() { cout << "Derived2()" << " "; }
    Derived2(int _x) : Base(_x) { cout << "Derived2(x)" << " "; }
};

class ReDerived : public Derived1, public Derived2 {
public:
    ReDerived() { cout << "ReDerived()" << " "; }
    ReDerived(int x) : Derived1(x), Derived2(x) { cout << "ReDerived(x)" << " "; }
};

int main() {
    ReDerived(5);

    return 0;
}
```

How many virtual table will be set up by the compiler?

- ☐ a) Base(x) Derived1(x) Base(x) Derived2(x) ReDerived(x)
- ☐ b) Base() Derived1(x) Base() Derived2(x) ReDerived(x)
- ☒ c) Base() Derived1(x) Derived2(x) ReDerived(x)
- ☐ d) Base() Base(x) Derived1(x) Derived2(x) ReDerived(x)

Yes, the answer is correct.

Score: 2

Accepted Answers:

c) Base() Derived1(x) Derived2(x) ReDerived(x)

3) Consider the following program.

2 points

```
#include <iostream>
using namespace std;

int incr(int* ptr) {
    return (*ptr)++;
}

int main() {
    int val = 10;
    const int *ptr = &val;

    val = incr(_____);    // LINE-1
    cout << val;

    return 0;
}
```

Fill in the blank at LINE-1 so that it will print 10.

- ☒ a) `const_cast <int *>(ptr)`
- ☐ b) `static_cast <int *>(ptr)`
- ☐ c) `dynamic_cast <int *>(ptr)`
- ☐ d) `reinterpret_cast <int *>(ptr)`

Yes, the answer is correct.

Score: 2

Accepted Answers:

a) `const_cast <int *>(ptr)`

4) Consider the below class hierarchy.

2 points

```
#include <iostream>
using namespace std;

class A {
public:
    virtual void f() { }
    void g() {}
};

class B : public A {
public:
    virtual void g() { }
    void h() { }
    virtual void i();
};

class C : public B {
public:
    void g() { }
    virtual void h() { }
};
```

What will be the virtual function table for class C?

- ☐ a) A::f(A* const)
C::g(C* const)
C::h(C* const)
B::i(B* const)
- ☒ b) A::f(A* const)
B::g(B* const)
C::h(C* const)
B::i(B* const)
- ☐ c) A::f(A* const)
B::g(B* const)
B::h(B* const)
C::i(C* const)
- ☐ d) A::f(A* const)
B::g(C* const)
C::h(C* const)
C::i(C* const)

No, the answer is incorrect.

Score: 0

Accepted Answers:

a) A::f(A* const)
 C::g(C* const)
 C::h(C* const)
 B::i(B* const)

5) How many virtual tables will be created for the following program:

2 points

```
class A { public: virtual void f() { } };  
class B : public A { };  
class C : public A { public: void g() {} };  
class D : public B, public C{ public: void g(){ }};
```

- ☐ a) 1
☐ b) 2
☐ c) 3
☒ d) 4

Yes, the answer is correct.

Score: 2

Accepted Answers:

d) 4

6)

2 points

Which statement in the following program generates compilation error?

```
#include <iostream>  
using namespace std;
```

```
int main() {  
    int i = 10;  
    double d = 3.14;  
    int *ip = &i;  
    double *pd;  
  
    i = static_cast<int>(d);           // statement-1  
    d = static_cast<double>(i);        // statement-2  
    pd = static_cast<double*>(ip);      // statement-3  
    i = static_cast<int>(&i);           // statement-4  
  
    return 0;  
}
```

- ☐ a) statement-1
☐ b) statement-2
☒ c) statement-3

☒ d) statement-4

Yes, the answer is correct.

Score: 2

Accepted Answers:

c) statement-3

d) statement-4

7) Consider the following code segment.

2 points

```
struct st1 { };
struct st2 { };
st1* s1 = new st1;
st2* s2 = new st2;
```

Which of the following type casting is permissible?

- ☐ a) `st2 = static_cast<st2*>(s1);`
- ☐ b) `st2 = dynamic_cast<st2*>(s1);`
- ☒ c) `st2 = reinterpret_cast<st2*>(s1);`
- ☐ d) `st2 = const_cast<st2*>(s1);`

Yes, the answer is correct.

Score: 2

Accepted Answers:

c) `st2 = reinterpret_cast<st2*>(s1);`

8) Consider the below classes.

2 points

```
class Base {
public:
    void f() { }
};

class Derived : public Base {
public:
    void g() { }
};
```

What is/are the appropriate option/s to perform up-casting where

```
Base b;
Derived d;
```

- ☒ a) `Base *bp = &d;`
- ☒ b) `Base *bp = (Base*)&d;`
- ☐ c) `Derived *dp = &b;`

☐ d) `Derived *dp = (Derived*)&d;`

Yes, the answer is correct.

Score: 2

Accepted Answers:

a) `Base *bp = &d;`

b) `Base *bp = (Base*)&d;`

9)

2 points

Consider the following program.

```
#include <iostream>
#include <exception>
using namespace std;

class Parent { virtual void fun() { } };
class Child : public Parent { void fun() { } };

int main() {
    try {
        Parent *pbd = new Child;
        Parent *pbb = new Parent;

        Child *pd = dynamic_cast<Child*>(pbd); // LINE-1
        if (pd == 0)
            cout << "Null pointer on first type-cast" << endl;

        pd = dynamic_cast<Child*>(pbb); // LINE-2
        if (pd == 0)
            cout << "Null pointer on second type-cast" << endl;

        pd = static_cast<Child*>(pbd); // LINE-3
        if (pd == 0)
            cout << "Null pointer on third type-cast" << endl;
    }
    catch (exception& e) {
        cout << "Exception: " << e.what();
    }

    return 0;
}
```

What will be the output?

- ☐ a) Null pointer on first type-cast
- ☐ b) Null pointer on third type-cast

- ☐ c) Exception: NULL pointer exception
- ☒ d) Null pointer on second type-cast

Yes, the answer is correct.

Score: 2

Accepted Answers:

d) Null pointer on second type-cast