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Unit 8 - Week 6

Assignment 6

The due date for submitting this assignment has passed. **Due on 2020-10-28, 23:59 IST.**

Assignment submitted on 2020-10-28, 22:28 IST

1) ***2 points***

Consider the program below.

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

class A {
public:
    void fun1() { cout << "A::fun1" << endl; }
    virtual void fun2() { cout << "A::fun2" << endl; }
};

class B : public A {
public:
    void fun1() { cout << "B::fun1" << endl; }
    void fun2() { cout << "B::fun2" << endl; }
};

int main() {
    A *t = new B();

    t->fun1();
    t->fun2();

    return 0;
}
```

What will be the output?

a) A::fun1
B::fun2

b) A::fun1
A::fun2

c) B::fun1
B::fun2

d) B::fun1
A::fun2

Yes, the answer is correct.
Score: 2

Accepted Answers:

a) A::fun1
B::fun2

2) ***2 points***

Consider the following program.

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

class Myclass {
public:
    virtual void fun() = 0;
};

void Myclass::fun() {                    // LINE-1
    cout << "Pure virtual function";
}

int main() {
    Myclass m;                           // LINE-2
    Myclass *p = new Myclass();          // LINE-3

    p->fun();                            // LINE-4

    return 0;
}
```

The given program does not compile. Identify the correct reason/s.

- [ ] a) LINE-1: Pure virtual function in `Base` cannot have a body
- [x] b) LINE-2: Cannot instantiate abstract class
- [x] c) LINE-3: Invalid operator new expression for abstract class type
- [ ] d) LINE-4: Cannot de-reference a null pointer

Yes, the answer is correct.
Score: 2

Accepted Answers:

b) LINE-2: Cannot instantiate abstract class

c) LINE-3: Invalid operator new expression for abstract class type

3) What will be the output of the following program?. **2 points**

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

class base {
public:
    virtual void fun() { cout << "base::fun" << endl; }
};

class derived : public base {
public:
    void fun() { cout << "derived::fun" << endl; }
};

int main() {
    derived t1;
    base *t2 = new derived();
    base *t3 = &t1;

    t2->fun();
    t3->fun();

    return 0;
}
```

a) base::fun
base::fun

b) base::fun
derived::fun

c) derived::fun
derived::fun

d) derived::fun
base::fun

Yes, the answer is correct.
Score: 2

Accepted Answers:
c) derived::fun
derived::fun

4) **2 points**

What will be the output of the below program?

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

int x = 0;

class myClass {
public:
    myClass() { x++; }
    ~myClass() { x--; }
};

class test : public myClass {
public:
    test() { x += 5; }
    ~test() { x -= 2; }
};

void fun() {
    test t;
    myClass *t1 = new test();

    cout << x << " ";

    delete t1;
}

int main() {
    fun();
   cout << x;

   return 0;
}
```

- a) 12 8
- b) 12 6
- c) 10 8
- d) 10 6

Yes, the answer is correct.
Score: 2

Accepted Answers:
a) 12 8

5) Consider the following program. **2 points**

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

class X {
public:
    virtual void fun() { }
};

class Y : public X {
public:
    void fun(int i) { }
};

int main() {
    Y t1;
    X *t2 = new Y();

    t1.fun();        // LINE-1
    t1.fun(3);       // LINE-2
    t2->fun();       // LINE-3
    t2->fun(3);      // LINE-4

    return 0;
}
```

Which line/lines will give you error?

- [x] a) LINE-1
- [x] b) LINE-2
- [ ] c) LINE-3
- [x] d) LINE-4

No, the answer is incorrect.
Score: 0

Accepted Answers:
a) LINE-1
d) LINE-4

6) Consider the program below. **2 points**

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

class A {
public:
    A() { cout << "A "; }
    ~A() { cout << "~A "; }
};

class B : public A {
public:
    B() { cout << "B "; }
    virtual ~B() { cout << "~B "; }
};

class C : public B {
public:
    C() { cout << "C "; }
    ~C() { cout << "~C "; }
};

int main() {
    A *t1 = new C;

    delete t1;

    return 0;
}
```

What will be the output?

- a) A B C ~C ~B ~A
- b) A B C ~C ~B
- c) A B C ~B ~A
- d) A B C ~A

Yes, the answer is correct.
Score: 2

Accepted Answers:

d) A B C ~A

7) Consider the program below. **2 points**

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

class A {
public:
    virtual void f1() { cout << "A::f1" << endl; }
    void f2() { cout << "A::f2" << endl; }
};

class B : public A {
public:
    void f1() { cout << "B::f1" << endl; }
    virtual void f2() { cout << "B::f2" << endl; }
};

class C : public B {
public:
    void f1() { cout << "C::f1" << endl; }
    void f2() { cout << "C::f2" << endl; }
};

int main() {
    A *a = new C();

    a->f1();
    a->f2();

    return 0;
}
```

What will be the output of the above code.

a) A::f1
   B::f2

b) B::f1
   C::f2

c) A::f1
   C::f2

d) C::f1
   A::f2

Yes, the answer is correct.
Score: 2

Accepted Answers:

d) C::f1
A::f2

8) **2 points**

Consider the following program.

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

class A {
    int a;
public:
    A(int i) : a(i) { }
    virtual void fun(A *) { cout << a << endl; }
};

class B : public A {
    int b;
public:
    B(int i = 0, int j = 0) : A(i), b(j) {    }
    void fun(B *) { cout << b << endl; }
};

int main() {
    A *t1 = new B(1, 2);

    t1->fun(new B);        // LINE-1

    return 0;
}
```

What will be the output?

- a) 0
- b) 1
- c) 2
- d) garbage

Yes, the answer is correct.
Score: 2

Accepted Answers:
b) 1

9) **2 points**

Identify the abstract class/es from the following code snippet.

```
class Flower {
public:
    virtual void Petals() = 0 { cout << "Flower"; }
};

class FlowerWSmell : public Flower {
    void Petals() { cout << "Flower with smell"; }
};

class FlowerWOSmell : public Flower { };

class Rose : public FlowerWSmell {
public:
    void Petals() { cout << "Rose Flower"; }
};

class Jasmine : public FlowerWSmell {
public:
    void Petals() { cout << "Jasmine Flower"; }
};

class Sunflower : public FlowerWOSmell {
public:
    void Petals() { cout << "Sunflower flower"; }
};

class Hibiscus : public FlowerWOSmell { };
```

- a) Flower, FlowerWSmell, FlowerWOSmell
- b) Flower, FlowerWOSmell, Hibiscus
- c) Flower, FlowerWSmell, FlowerWOSmell, Sunflower
- d) Flower

Yes, the answer is correct.
Score: 2

Accepted Answers:
b) Flower, FlowerWOSmell, Hibiscus