

2
0
=

12) Good Luck!

- 11) Do not begin until you are instructed to do so.
- 10) You are not required to write comments for any code in this test.
- 9) If you need "scratch" paper, use your Blue Book but cross out anything you do not want graded.
- 8) Put your name and ID number as indicated on each page of this test. Please circle your last name. Thank you.
- 7) Put your name and ID number on the cover of your Blue Book.
- 6) Place your answers for questions 12 and 13 in your Blue Book.
- 5) Place your answers for questions I-II in this document.
- 4) Do not tear any pages from this document. Be sure that you hand in all 6 pages of this test, including this cover sheet.
- 3) Do not tear any pages out of your Blue Book.
- 2) Write NEATLY.
- 1) **DO NOT CHEAT.** (They told me I have to say that.)

- A good strategy would be to do all the short questions that you can do *quickly*.
- There are two LONG problems at the end of the test.
- Then get to the LONGER problems at the end of the test.
- and finally go back through the shorter ones.

NOTE:

Exam Two

Spring 2011

CS1124

Poly-Id:

Name: _____

- a. operator=(thingtwo, thingone) \rightarrow ~~public~~ b. thingtwo.operator=(thingone) \rightarrow ~~private~~

Neither a. nor b. because the operator can't be overridden
Neither a. nor b. because the operator has to be overridden as a friend
Neither a. nor b. because the operator needs to be defined in the class.
Either (a) or (b), depending on how the programmer choose to implement the operator.

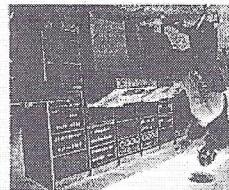
What function call is the following expression equivalent to?
~~operator & string =~~
String toString() = ~~String~~ — ~~Object~~

4. Given a class called Thing and the code

Questions 4–10 are four points each.

2. [2 pts] The data members in the initialization list are initialized after the body of a constructor begins executing.

True False



1. [extra credit] Who created C, (not C++)

Poly-Id:

Name: _____

5. What would be the result of:
- ```

class Base {
public:
 Base() { cout << "In Base" ; }
 virtual void bar() { cout << "In Base bar()" ; }
};

class Derived : public Base {
public:
 Derived() { cout << "In Derived" ; }
 void foo() { cout << "In Derived foo()" ; }
 ~Derived() { cout << "In Derived destructor" ; }
};

Base* p = new Derived();
p->foo();
cout << endl;

```
- a. None of the above  
b. Base::bar()  
c. Runtime error  
d. Base bar()  
e. In Base bar()
- (Note: The code above outputs "In Base", "In Base bar()", and then a new line.)*
6. What would be the result of:
- ```

int main() {
    base = derived;
    derived derived;
    int main() {
        derived bar();
    }
}

```
- a. None of the above
b. Base bar()
c. Runtime error
d. In Derived bar()
e. In Base bar()
- (Note: The code above outputs "In Derived bar()", which is incorrect because it's printing from the base class's implementation of main().)*

Read carefully.

Note: Questions 5 - 7 refer to the classes defined below.

Name: _____

Poly-Id: _____

Question 7: What would the code do?

Code: class H3 { public: "Hello World!" }.

What is the best way he can fix his Vector class so that the last line will not compile?

Looking at this test code, he sees that the last line was a mistake, and is surprised that it compiled without an error.

Code: Vector v; v = 17; // Huh? for (int i = 0; i < 42; ++i) v.push_back(i);

9. A student implements a vector class. Testing his class, he writes some code:

None of the above

p = &another; // Does not compile - exactly

int another = 42;

*p = 42; // Does not compile

Line A does not compile

Line B does not compile

Which of the following is true?

int* const p = &theAnswer; // Line A

int theAnswer = 17;

Given: *Code: int a = 17;*

Run time error

nothing.

The program runs and prints

In Base destructor

The program runs and prints

In Derived destructor

The program runs and prints

In Base destructor

The program runs and prints

In Derived destructor

The program runs and prints

In Base destructor

The program runs and prints

In Derived destructor

The program runs and prints

In Base destructor

The program runs and prints

In Derived destructor

The program runs and prints

In Base destructor

The program runs and prints

Poly-ID: _____

Name: _____

7. Using the classes on the previous page, what would be the result of:

I

[Yes, you're right, it would normally be unnecessary to write this for the Derived, but we want you to do it anyway.]

[Yes, you're right, it would normally be unnecessary to write this for the Derived, but we want you to do it anyway.]

11. [5 pts] Given
- o Derived has an int member variable named `foo`
- o Derived publicly inherits from Base
- o a class Derived
- o a class Base
- Write a copy constructor for Derived.
- $\text{foo} = \text{Base}.\text{foo}$
- $\text{Derived}(\text{const} \text{Base} &\text{rhs}) : \text{Base}(\text{rhs})$
- 3

// This can only create instances of subclasses that do.

// Note that does not guarantee the same

3

private `foo() const = 0;`

class BaseClass

public:

We want to be sure that all classes that inherit from BaseClass to override the method `foo()`.

Modify the above code to guarantee that.

```
class BaseClass {
public:
    void foo() const;
};


```

10. Given:

Name: _____

Poly-Id: _____

- Foo has just one field, a vector of Club pointers.
- The class Club has any necessary methods and operators.
- Define the assignment operator for Foo.
- Define the copy constructor or copy constructor.
- Naturally, copying should involve making a deep copy. Don't just copy pointers!
- Two Fools are considered equal if all of their Clubs are equal. (I.e. same number of Clubs and each Club in one Foo matches the Club in the same position in the other Foo.)
- The Clubs do not have to have the same address to be equal.
- And yes, Club does have an equality operator.
- Do NOT define Club. Do NOT write a main. Just define the class Foo as stated above.
- Note: Foo does have a method to add Clubs, but you don't have to write it or use it.
- I just mention it, in case you were wondering how the Clubs got there.
- Also, Clubs are never removed from their Foo. This makes your life easier.

13. [31 points] Define the class Foo:

```

int main() {
    Person john("John"), fred("Fred"), mary("Mary"), sue("Sue");
    fred.marries(sue);
    john.marries(mary);
    mary.dump(john);
    sue.dump(fred);
    cout << john << endl;
    cout << mary << endl;
    cout << sue << endl;
    fred.prints();
    mary.prints();
    sue.prints();
}

```

Test code:

- People in the land of WoZ like to get married.
- Unfortunately, they are not terribly concerned about the sanctity of marriage, which means that when marrying,
- a Person may dump (i.e. divorce) their current spouse
- or steal someone else's spouse.
- Your job is to define the class Person so that the code below works correctly.
- Note the use of the output operator.
- Yes, this involves pointers. Yes, people have to be told if they have been dumped, stolen, etc.
- Do not store your spouse's name in the Person class!
- Note: the matures method does not display anything

12. [30 points] Define the class Person.

- Place the answers to the following questions in your Blue Book.
- Comments are not required in the blue book!
- However, if you think they will help us understand your code, feel free to add them.
- Separate compilation is not required.
- It will just take more of your time to define the methods outside of the class and will not earn you any additional points.
- Includes and using namespaces directives are not required.
- Read the questions carefully!
- People in the land of WoZ like to get married.
- Unfortunately, they are not terribly concerned about the sanctity of marriage,
- which means that when marrying,
- a Person may dump (i.e. divorce) their current spouse
- or steal someone else's spouse.
- Your job is to define the class Person so that the code below works correctly.
- Note the use of the output operator.
- Yes, this involves pointers. Yes, people have to be told if they have been dumped, stolen, etc.
- Do not store your spouse's name in the Person class!
- Note: the matures method does not display anything

Programming - Blue Book