CS 3A Final Exam Review II

1. An object is an instance of a **Class**.

2. ________ is invoked to create an object.
   A. A constructor
   B. The main function
   C. A function with a return type
   D. A function with the void return type

3. Which of the following statements are true?
   A. A default no-arg constructor is provided automatically if no constructors are explicitly defined in the class.
   B. At least one constructor must always be defined explicitly.
   C. Constructors do not have a return type, not even void.
   D. Constructors must have the same name as the class itself.
   E. Constructors are invoked when an object is created.

4. Analyze the following code:

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

class A
{
public:
    int s;

    A(int newS)
    {
        s = newS;
    }

    void print()
    {
        cout << s;
    }
};

int main()
{
    A a;
    a.print();
}
```

A. The program has a compilation error because class A is not a public class.
B. The program has a compilation error because class A does not have a default constructor.
C. The program compiles and runs fine and prints nothing.
D. The program would compile and run if you change A a to A a(5).

5. Which of the following statements are true?

//everything is true, helps to think an object as just a portion of memory carved out where //you can modify it as you wish

A. Object names are like array names. Once an object name is declared, it references to an object.

B. Object names cannot be reassigned to reference another object. //the closest thing to //this is just copying the contents of one object to another, but never are we allowed for //the object name to "point" to another object (piece of memory that holds the object) //we are only able to modify the memory associated with it. This would be different if //we had a pointer to a specific object.

C. An object name is a constant, though the contents of the object may change.

D. An object is associated with only one object name.

6. Analyze the following code.

```
#include <iostream>
using namespace std;
class B
{
public:
    B() { };
    int k;
};
int main()
{
    B b;
    cout << b.k << endl;
    return 0;
}
```

A. The program has a compile error because `b.k` cannot be accessed.

B. The program displays 0.

C. The program displays 1.

D. The program displays unpredictable number.

E. The program has a runtime error because `b.k` does not have a value.

7. Which of the following statements are true?

A. Use the private keyword to encapsulate data fields.

B. Encapsulating data fields makes the program easy to maintain.

C. Encapsulating data fields makes the program short.

D. Encapsulating data fields helps prevent programming errors.

E. If you don't use the public keyword, the visibility is private by default.

8. Which of the following statements are correct?

A. C++ allows you to pass a parameter of object type in a function by value.
B. C++ allows you to pass a parameter of object type in a function by reference.
C. Passing objects by reference is commonly used because it saves memory.
D. You should define constant reference parameters for objects that are not supposed to be changed in the function.

9. Analyze the following code:

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

class Name
{
public:
    string firstName;
    char mi;
    string lastName;

    Name(string firstName1, char mi1, string lastName1)
    {
        firstName = firstName1;
        mi = mi1;
        lastName = lastName1;
    }
};

int main()
{
    string firstName("John");
    Name name(firstName, 'F', "Smith");
    firstName = "Peter";
    name.lastName = "Pan";
    cout << name.firstName << " " << name.lastName << endl;
}
```

A. The program displays Peter Pan.
B. The program displays John Pan.
C. The program displays Peter Smith.
D. The program displays John Smith.

10. Given the declaration `Circle x[10]`, which of the following statements is correct?
A. x contains an array of ten `int` values.
B. x contains an array of ten objects of the `Circle` type.
C. Each element in the array is a `Circle` object.
D. You cannot assign a new object to the elements in the array, but you can change the contents in each object element.

11. Which of the following statements is correct.
   A. `int count = 5; int* x = &count;`
   B. `int count = 5; int x = &count;`
   C. `int count = 5; int& x = &count;`
   D. `int count = 5; int** x = &count;`

12. Suppose you declare an array `double list[] = {1, 3.4, 5.5, 3.5}` and compiler stores it in the memory starting with address `04BFA810`. Assume a double value takes eight bytes on a computer. `&list[1]` is ______.
   A. 04BFA810 **B. 04BFA818** C. 1 D. 3.4

13. Suppose you declare an array `double list[] = {1, 3.4, 5.5, 3.5}`.
   `*(list + 1)` is same as ________.
   A. `*list`
   B. `*list + 1`
   C. `*list + 2`
   D. `list[0]`
   E. `list[1] //true`

14. Which of the following declaration is correct?
   A. `int* pValue = new double;`
   B. `int* pValue = new int;`
   C. `double* pValue = new double;`
   D. `double* pValue = new int;`

15. Suppose list is declared as follows:
   `int* list = new int[10];`

   How should you destroy list?
   A. `delete list;`
   B. `delete* list;`
   C. `delete [] list;`
   D. `delete [] *list;`

16. Which of the following statements are correct?
   A. `Circle* pObject = new Circle();`
   B. `Circle pObject = new Circle();`
   C. `Circle* pObject = new Circle;`
   D. `Circle pObject = Circle();`

17. Which of the following statements are true?
   A. Every class has a copy constructor with the signature `ClassName(const ClassName&)`. //will always have at least a default copy constructor
   B. The copy constructor can be used to create an object initialized with another object's data.
   C. By default, the copy constructor simply copies each data field in one object to its counterpart in the other object.
   D. By default, the copy constructor performs a shallow copy.

18. If you define the swap function as follows:

```
template<typename T>
void swap(T& var1, T& var2)
{
    T temp = var1;
    var1 = var2;
    var2 = temp;
}
```

You can invoke swap using ______.

A. swap(1, 2) //**can’t have references to just values**

B. int v1 = 1; int v2 = 2; swap(v1, v2); //TRUE CORRECT

C. int v1 = 1; int v2 = 2; swap(&v1, &v2); //**&v1 is just a value**
//C has the exact same problem as A

D. int v1 = 1; double v2 = 2; swap(v1, v2); **//different types are not allowed**

B. int v1 = 1; int v2 = 2; swap(v1, v2); //TRUE CORRECT

19. Suppose you define

```
template<typename T = int>
class Stack
{
  Stack();
  ...
};
```

//probably want to make constructor public to begin with!

Which of the following statements are correct?

A. Stack<double> s;

B. Stack<int> s;

C. Stack<> s;

D. Stack s;//probably meantC

E. Stack<int, double> s; //to many args

20. What is wrong in the following code?

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

int main()
{
    vector<int> v;
    cout << v[0];
    return 0;
}
```

A. The program has a compile error on `v[0]`.

B. The program has a runtime error on `v[0]`, because the vector is empty.

C. The program has a compile error on `vector<int> v`.

D. The program has a runtime error on `vector<int> v`.

21. The signature for the < operator function for comparing two `Rational` objects is __________.

A. `bool operator<(Rational& secondRational) //prefered (although added const modified to Rational& would probably be even better)`

B. `bool <operator(Rational& secondRational)`

C. `bool operator<(Rational secondRational) //would also be right //would do unnecessary copying though`

D. `bool operator(<)(Rational& secondRational)`

22. What is the output of the following code?

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

class ParentClass
{
public:
    int id;
    ParentClass(int id)
    {
        this->id = id;
    }
    void print()
    {
        cout << id << endl;
    }
};

class ChildClass: public ParentClass
{
public:
    int id;
    ChildClass(int id): ParentClass(1)
    {
        this->id = id;
    }
};

int main()
{
    ChildClass c(2);
    c.print();
    return 0;
}
```

A. 0
B. 1
C. 2
D. Nothing

23. Suppose class A is derived from B and both A and B have no-arg constructors. To invoke B's constructor from A, use ________.

A. `A(): B() { ... }` B. `A(): { B(); ... }`
C. `B(): A() { ... }` D. `B(): { A(); ... }`

//A is correct
//B is incorrect because you are making a instance of the object B which probably does
//not have the indeed effect of initializing "the B part" of the A object.

24. If you enter 1 0, what is the output of the following code?

```
#include <iostream>
using namespace std;
int main()
{
    // Read two integers
    cout << "Enter two integers: ";
    int number1, number2;
    cin >> number1 >> number2;
    try
    {
        if (number2 == 0)
            throw number1;
        cout << number1 << " / " << number2 << " is "
             << (number1 / number2) << endl;
        cout << "C" << endl;
    }
    catch (int e)
    {
        cout << "A" << endl;
    }
    cout << "B" << endl;

    return 0;
}
```

A. A B. B C. C **D. AB (with a new line between them)**

25. Fill in the code to complete the following function for computing a Fibonacci number.

```
long fib(long index)
 {
     if (index == 0) // Base case
         return 0;
     else if (index == 1) // Base case
         return 1;
     else // Reduction and recursive calls
         return __________________;
 }
```

A. fib(index - 1)

B. fib(index - 2)

C. fib(index - 1) + fib(index - 2)

D. fib(index - 2) + fib(index - 1)