Fisk University
Introduction to Computer Science II, Spring 2009
Quiz #4 Friday, Feb 13th, 2009

There are 10 questions to be answered in 20 minutes maximum. Please write legibly.

Q1: Which of the following is not true of a constructor and destructor of the same class?

a. They both have the same name aside from the tilde (~) character.
b. They are both usually called once per object created.
c. They both are able to have default arguments.
d. Both are called automatically, even if they are not explicitly defined in the class.

Q2: Given the class definition:

class CreateDestroy
{
    public:
        CreateDestroy() { cout << "constructor called, " ; } 
        ~CreateDestroy() { cout << "destructor called, " ; } 
};

What will the following program output?

int main()
{
    CreateDestroy c1;
    CreateDestroy c2;
    return 0;
}

a. constructor called, destructor called, constructor called, destructor called, . 
b. constructor called, destructor called, . 
c. constructor called, constructor called, . 
d. constructor called, constructor called, destructor called, destructor called, .

Q3: Complete the program.

class CreateDestroy {
    int * ptr;
public:
    CreateDestroy() { ptr = new int[10]; } 

    ~CreateDestroy() { ___________________________ } 
};
Q4: Which of the following is false about the new operator and the object for which it allocates memory?

a. It calls the object’s constructor.
b. It returns a pointer.
c. It does not require the size of the object to be explicitly specified in the new expression.
d. It automatically destroys the object after main is exited.

Q5: The delete operator:

a. Can terminate the program.
b. Must be told which destructor to call when destroying an object.
c. Can delete an entire array of objects declared using new.
d. Is called implicitly at the end of a program.

Q6: Write the output of the following program.

```cpp
class CreateDestroy
{
    char str[8];
    int p;
public:
    // strcpy copies the source string into the destination string.
    // The first parameter is destination, and the second is source.
    CreateDestroy(char *s) { strcpy(str, s); }
    ~CreateDestroy() { cout << str << endl; }
};

int main()
{
    CreateDestroy c1("c1"); // create c1.
    int i = 10;
    if (i > 5) {
        CreateDestroy c2("c2"); // create c2.
    }
    return 0;
}
```

Q7: What is the output considering the class in the previous question?

```cpp
int main()
{
    CreateDestroy c1("c1");
    int i = 10;
    if (i > 5) {
        CreateDestroy *cdptr = new CreateDestroy("c2");
    }
}
```
Q8: What is wrong in the Q7’s program?

   a. Can’t call new with a constructor of a class
   b. delete cdptr should be added outside if.
   c. delete cdptr should be added inside if.
   d. The program is perfect.

Q9: What is the output considering the class in the previous question?

```cpp
int main()
{
    cout << sizeof(CreateDestroy);
    cout << sizeof(new CreateDestroy("c1"));
    CreateDestroy cd[5];
    cout << sizeof(cd);
}
```

Q10: Will the following program run out of memory?

```cpp
class CreateDestroy
{
    int * ptr;
public:
    CreateDestroy() { ptr = new int(10); }    
    ~CreateDestroy() { delete ptr; }
};

int main()
{
    for(;;)
    {
        CreateDestroy cd;
    }
}