计算机科学系　　2012 下学期

《程序设计 II》期末考试试题(A)：参考答案

任课教师：　吴维刚，刘晓铭，刘聪　　考试形式：闭卷　　考试时间：2 小时

1. Single choice selection (20 points, 1 each)

Only one choice in each question is correct, no point will be given if more than one choice is selected.

CCBCD BBBBA ABBAC AADCB

2. Output analysis (20 points, 5 each)

Write the printout of the following programs.

1). Constructor and destructor

People()

People(People &)

~People()

~People()

2). Inheritance and virtual function

Slow

Heavy

3). String and vector

apple

apple juice

orange

4). Template and exception

2.5

1.5

0.5

caught: EmptyStackException

3. Error correction (20 points, 5 each)

In each program, there are 5 errors, i.e. totally 15 errors. You need to find out at least 10 of them, 2 points for each one.

1). Class and object

```
1)  #include <iostream>
2)  using namespace std;
3)
4)   class A
5)   {
6)        int value;
7)   public:
8)        void   A(int value) {                    //delete “void”
9)             this.value = value;                //this->value
10)       }
11)
12)       A(A &a) {
13)            value = a->value;                  //a.value
14)       }
15)       ~A(A a) {                               //~A()
16)       }
17)  };
18)
19)  int main() {
20)       A a;                                    //a(0)
21)       return 0;
22)  }
```

2). Inheritance and polymorphism

```
1)        #include <iostream>
2)        using namespace std;
3)
4)        class Base
5)        {
6)             virtual print() const = 0;          //vitual void
7)        }                                         //};
8)
9)        class Inherited :: public Base            //::➔ :
10)       {
11)       public:
12)            void print() const {
13)                 cout << "Inherited" << endl;
```

```
14)                         return 0;                   //delete the statement
15)                     }
16)             };
17)
18)             int main() {
19)                     Inherited()-> print();          // Inherited().
20)                     return 0;
21)             }
```

3). Template and vector

```
1)      #include <iostream>
2)      #include <vector>
3)      using namespace std;
4)
5)      template <typename E>
6)      class MyQueue<E>                    //MyQueue
7)      {
8)      private:
9)              vector    impl;               //vector<E>
10)
11)     public:
12)             void enqueue(E &e){
13)                     impl.push_back(e);
14)             }
15)             E dequeue();
16)     };
17)                                         //template <typename E>
18)     E    MyQueue<E>::dequeue() {
19)             E e = impl[0];
20)             impl.pop_back();
21)                                         //return e;
22)     }
23)
24)     int main() {
25)             MyQueue<double> q;
26)             q.enqueue(100);
27)             q.dequeue(0);               //q.dequeue();
28)     }
```

4. Concept explanation with example (20 points, 5 each).

Please explain the following concepts with concrete examples. You can choose 4 out of all the 5 questions to answer.

1) The meaning of encapsulation in class

- Put the data and functions together, and make them to be integrity.

- The details of the data and functions are hidden from user program of the class.

2) The relationship between class and object

- Class:
  - The abreaction of objects; represents the common properties and behaviors of them; like a data type.
- Object:
  - The instance of class; has concrete values of properties, like a variable.

3) The difference between shallow copy and deep copy

- Shallow copy is simple member wise copy
- Deep copy will allocate new space to be pointed by a pointer member so as to avoid that the pointers of different object point to the same space.

4) The similarity and difference between the vector container and an array

- Similarity: both store a sequence of elements with the same type
- Difference: vector is a class, which encapsulate various functions to ease the operation of element sequence. Array is just a continuous memory space, no predefined functions are available.

5. Programming (20 points).

Please complete the following program.

```
62 void ClassmateInfoList::add(const ClassmateInfo & info) {
63     for (int i = 0; i < infoList.size(); ++ i) {
64         if (infoList[i].name == info.name) {
65             throw NameExistingException();
66         }
67     }
68     infoList.push_back(info);
69 }
70
71 ClassmateInfo ClassmateInfoList::getByName(const string & name) const {
72     for (int i = 0; i < infoList.size(); ++ i) {
73         if (infoList[i].name == name) {
74             return infoList[i];
75         }
76     }
77     throw NoSuchNameException();
78 }
79
80 vector<ClassmateInfo> ClassmateInfoList::getByAddress(const string & address) const {
81     vector<ClassmateInfo> vec;
82     for (int i = 0; i < infoList.size(); ++ i) {
83         if (infoList[i].address == address) {
84             vec.push_back(infoList[i]);
85         }
86     }
87     return vec;
88 }
```