College of Computer and Cyber Security

(Fujian Normal University (China))

University of HUDDERSFIELD

NPE2010

Engineering Investigative Studies

Computing Foundation Year

Time allowed: 2 hours

年级: _________	**姓名: _________**	**FNU 学号: ___________**
Grade: _______	**Name:___________**	**UOH No.___________**

Instructions to Candidates:

This is an unseen closed book examination.

The exam paper consists of four sections. Candidates must answer all questions. Section A contains 10 questions (3 marks each), Section B contains 3 questions (4 marks each blank), Section C contains 4 questions (8 marks each), Section D contains 1 question (14 marks).

Access to any other materials is not permitted.

(Turn Over)

Section A. Selecting the results (30 marks in total, 3 marks per question)

1, The private member of the base class is derived by protected, then its access right in the derived class is__________

A. private
B. protected
C. public
D. invisible

2, In a derived class, which one of the base class can directly access? __________

A. public members and private members
B. protected members and private members
C. all members
D. public members and protected members

3, If class A is declared as a friend of class B, then__________

A. A member of class A is also member of class B
B. A members of class B is also member of class A
C. Member functions of class A must not access members of class B
D. Class B is not necessarily a friend of class A

4, In the following description of the destructor, which is correct? __________

A. The return type of the destructor is void
B. The destructor has no parameters and cannot be overloaded
C. The body of destructor must contain a delete operation
D. A destructor cannot contain a loop

5, An example of class overloaded operator is:

```
class CMyPoint
{        int x, y;
  public:
           CMyPoint(int i, int j){ x=i; y=j; }
           CMyPoint operator+(CMyPoint &p)
           { return CMyPoint(x+p.x, y+p.y); }
};
```

p1 and p2 are objects of this class. Which of the following methods is wrong? __________

A. CMyPoint p3 = p1+p2;
B. operator+(p1, p2);
C. p1=p1.operator +(p2);
D. p1=p1+(p2);

6, In the following description of constant member functions, which is correct? __________

A. Constant member functions cannot update the data members of an object.
B. Constant member functions cannot be called by other non-constant member functions in the class.

C. Only constant objects can call constant member functions.
D. The 'new' operation is not allowed in a constant member function.

7, The copy initialization constructor of class MyA is: _________

A. MyA()
B. MyA(MyA*)
C. MyA(MyA&)
D. MyA(MyA)

8, Polymorphism refers to _________

A. Different objects call functions with different names
B. Different objects call a function with the same name
C. An object calls functions with different names
D. An object calls different functions with the same name

9, Which of the following description of overloaded operator is correct? _________

A. the number of operands can be changed
B. the priority of the operator can be changed
C. the associativity of the operator can be changed
D. the function of the operator can be changed

10, Which of the following description of static members is correct? _________

A. Static data members are data shared by all objects of a class
B. Static data members of a class can be initialized inside the class
C. Different objects of a class have different values of static data member
D. Static data members cannot be accessed through objects of a class

Section B. Reading and Filling in the blank (24 marks in total, 4 marks per blank)

1, The result of the following program is :10,20. Please fill in the appropriate content at 【　　　】.

```
class Base {
      int data;
public:
      Base ( ) { };
      【              】
      int getData( )    {
            return data;
      }
};
int main() {
      Base A(10);
      cout<<A.getData( )<<", ";
      Base *p = 【          】;
      cout<<p->getData( )<<endl;
}
```

2, The result of the following program is: 20. Please fill in the appropriate content at 【   】.

```
template 【                        】
T myMax(T x, T y)
{
    return 【                        】;
}
void main()
{
    int s1=10, s2=20;
    cout <<myMax(s1, s2) <<endl;
}
```

3, The following code completes the definition of Complex classes. Please fill in the appropriate content at 【   】.

```
class Complex
{
private:
    double real, image;
public:
    Complex(double r=0, double i=0) { real=r; image=i; }
    friend Complex operator+(Complex &a, const Complex &c); //complex addition operator
    Complex operator=(Complex c2); //complex assignment operator
};
Complex operator+(Complex &a, const Complex &b)
{
    Complex *tmp = new Complex ( 【                    】 );
    return *tmp;
}
Complex Complex::operator = (Complex c)
{
    real = c.real;
    image = c.image;
    return ( 【                    】 );
}
```

Section C. Reading and Write the result. (32 marks in total, 8 marks per question)

1, Write the results of the following program.

```
class Person
{
private:
     char name [20];
public:
     Person(const char* s){ strcpy(name, s); }
     void display( ){ cout<<"Name:"<<name<<endl; }
};
class Student:public Person
{
        int grade;
public:
        Student(const char* s, int g): Person(s){ grade = g; }
       void display( )
       {
              Person::display();
              cout<<"Grade:"<<grade<<endl;
       }
};
void main( )
{
        Student s("Smith",90);
        s.display( );
}
```

2, Write the results of the following program.

```
class CStudent
{
       int sno;
public:
       static int stuCount;
       CStudent() { stuCount++; }
       CStudent(int sno):sno(sno) { stuCount++;}
       ~CStudent(){}
};
int CStudent::stuCount = 0;
int main()
{
       CStudent stu1(1);
       cout<<stu1.stuCount<<endl;
       CStudent *pstu = new CStudent[2];    //pstu points to an array containing two objects
       cout<<stu1.stuCount;
}
```

3, Write the results of the following program.

```
class A{
       int a;
public:
       A(int aa=0){ a=aa; cout<<"a="<<a<<endl; }
};
class B:public A{
       int b;
public:
       B( ){ cout<<"C default constructor"<<endl; }
       B(int i, int j):A(i),b(j){ cout<<"C constructor"<<endl; }
};
int main()
{
       B b1;
```

```
     B b2(5, 6);
}
```

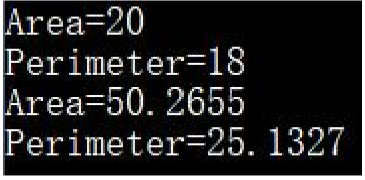
4, Write the results of the following program.

```
class CStudent{
      int sno;
public:
CStudent(int sno):sno(sno) { }
      CStudent():sno(0){}
      CStudent(CStudent& stu){ sno = stu.sno+1;}
      void display(){ cout<<sno<<endl; }
      void display( CStudent s ){ cout<<s.sno<<endl; }
      ~CStudent(){}
};
int main(){
     CStudent stu1(1);
     stu1.display();
     stu1.display(stu1);
}
```

Section D. Programming (14 marks in total)

1, Design abstract classes and derived classes:

- Define abstract class CShape, it contains:
  - GetArea(): pure virtual function for calculating area.
  - GetPerimeter(): pure virtual function for calculating the perimeter of an object.
- Derived class CRectangle, it contains:
  - Derived from class CShape.
  - Data members: length, width.
  - Implement GetArea() and GetPerimeter() functions.
- Derived class CCircle, it contains:
  - Derived from class CShape.
  - Data member: radius.
  - Implement GetArea() and GetPerimeter() functions.
- Declare the base class pointer and derived class object in the main function, and call the member functions GetArea() and GetPerimeter() of different objects through the base class pointer.
- An example of the results of running this program:



```
Area=20
Perimeter=18
Area=50.2655
Perimeter=25.1327
```

Vocabulary:

Polymorphism at compile time：编译时的多态性

dynamic storage space：动态存储空间

assign value：赋值
the number of operands：运算符的目数
the priority of the operator：运算符的优先级
the associativity of the operator：运算符的结合性
the number of operands：运算符的功能
abstract class：抽象类
pure virtual function：纯虚函数
base class pointer：基类的指针

(End of Exam Paper)