本試題雙面印製

1. Evaluate the value of variable **c** of the following expressions of C++ code. (10%)

   float a = 7.0F, b= 2.0F, c;

Print out the value of c	(c) c = a / y;
(a) c = x / y;	(d) c = a / (float)y;
(b) c = a / b;	(e) c = (float) (a / y);

2. Print out the output of following program. (10%)

```
#include <iostream>                      int main() {
using namespace std;                         int x[8] = {2, 4, 6, 8, 10, 12, 14, -99};
void fun(int *);                             int y[8] = {1, 3, 5, 7, 9, -99, 11, 13};
void fun(int *data) {                        fun(x);
    for(int i = 0; data[i] != -99; ++i)      fun(&y[2]);
        cout<<data[i]<<endl;                 return 0;
}                                        }
```

3. Find the error in each of the following segments. **If the error can be corrected, explain how**. (10%)

```
(a)                                      (d)
int *number;                             int n;
*number = 10;                            int data[n];
(b)                                      cout<<"input array size:";
int x, *ptr;                             cin>>n;
ptr = *x;                                (e) // function fac() return 1*2*3*...*n
(c)                                      int fac(int n) {
const float PI;                              if (n == 0) return;
PI = 3.1415F;                                fac(n-1)*n;
                                         }
```

4. State whether each of the following is true or false. **If false, explain why**. (15%)

(a) All virtual functions in an abstract base class must be declared as pure virtual functions.

(b) Referring to a derived-class object with a base-class handle is dangerous.

(c) A class is made abstract by declaring that class virtual.

(d) If a base class declares a virtual function, a derived class must implement that function to become a concrete class.

(e) Polymorphic programming can eliminate the need for switch logic.

5. The compiler will show error message that is "`int Bank::money' is private." Use "**friend**" to modify the program, let the class Customer can access the private members of class Bank. (5%)

```
class Bank {
    private:
        int money;
};
class Customer {
    public:
        int GotMoney(Bank, int);
}
```

```
int Customer::GotMoney(Bank x, int y) {
    x.money = x.money – y;
    return y;
}
```

6. What prints when the following program is performed? (10%)

```
#include <iostream>
using namespace std;
class Unit {
    private:
        static int x;
        int y;
    public:
        Unit();
        void ShowXY();
};
Unit::Unit():y(0) {
}
```

```
void Unit::ShowXY() {
    cout<<"x = "<<++x<<endl;
    cout<<"y = "<<++y<<endl;
}
int Unit::x = 0;
int main() {
    Unit obj1, obj2, obj3;
    obj1.ShowXY();
    obj2.ShowXY();
    obj3.ShowXY();
    return 0;
}
```

7.

```
class stack {
    private:
        int s[STACK_SIZE];
        int top;
    public:
        stack(void);
        void Push(int);
        int Pop(void);
};
```

```
stack::stack(void): top(-1) { }
void stack::Push(int dada) {
    s[++top] = data;
}
int stack::Pop(void) {
    return s[top--];
}
```

(a) Using **template** to modify the class stack, programmer can specify the data type at declaration. (10%)

(b) Declaring two stacks, one is stored the double, the other is stored the char. (5%)

8. Which of the following declarations, if any, are incorrect? (5%)

class Base {…};

(a) class Derived : public Derived {…};

(b) class Derived : Base {…};

(c) class Derived : private Base {…};

(d) class Derived : public Base {…};

(e) class Derived extends Base {…};

9.

```cpp
#include <iostream>
using namespace std;
class A {
  public:
    void Print();
};
void A::Print() {
  cout<<"class A"<<endl;
}
class B:public A
{
  public:
    void Print();
};
void B::Print()
{
  cout<<"class B"<<endl;
}
```

```cpp
class C:public A
{
  public:
    void Print();
};
void C::Print()
{
  cout<<"class C"<<endl;
}
int main()
{
  A objA, *ptrA;
  B objB, *ptrB;
  C objC, *ptrC;
  ….. // answer the following questions
  return 0;
}
```

(a) What prints when the following codes in main() is performed? (5%)

(1)	(2)

ptrA = &objA;
ptrA->Print();
ptrB = &objB;
ptrB->Print();
ptrC = &objC;
ptrC->Print();
	ptrA = &objA;
	ptrA->Print();
	ptrA = &objB;
	ptrA->Print();
	ptrA = &objC;
	ptrA->Print();

(b) Use the **virtual function** to modify the program, let the output of (2) is the same as (1). (5%)

10. What prints when the following program is performed? (10%)

```cpp
#include <iostream>
using namespace std;
class A {
  public:
    A();
    ~A();
};
A::A() {
  cout<<"A()"<<endl;
}
A::~A() {
  cout<<"~A()"<<endl;
}
class B : public A {
  public:
    B();
    ~B();
};
B::B() {
  cout<<"B()"<<endl;
}
B::~B() {
  cout<<"~B()"<<endl;
}
int main() {
    A *ptrA;
    B *ptrB;
    ptrA = new A;
    ptrB = new B;
    delete ptrA;
    delete ptrB;
    return 0;
}
```