

淡江大學 97 學年度碩士班招生考試試題

87-1

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系別：資訊工程學系

科目：程式語言 C++

准帶項目請打「V」
簡單型計算機

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1. Evaluate the following expressions as C++ would be: (10%)

a. $6*5/4$ b. $6.0*3/2$ c. $12\%4/2$	d. $(float)3/2$ e. $(float)(3/2)$
--	--------------------------------------

2. (10%)

- a. Declare an array of character and initialize it to the string "Hello World!".
- b. If *PI* is a double variable. Declare *PI* as a constant variable and initialize to the value 3.14159265.
- c. Suppose *score* is an array of 20 integers. Declare a pointer named *ptr* that points to the first element of array *score* and use this point to display the first and last elements of the array.
- d. There is a variable of integer named *armor*. Declare a reference variable named *AC* that refers to *armor*.
- e. A pointer of float named *ptr*, use this pointer *ptr* and operator *new* to create an array of 30 elements.

3. Use *switch* to rewrite the following segment (10%)

```

if (score<=100 and score>=90)
    aGrade++;
else if (score>=80)
    bGrade++;
else if (score>=70)
    cGrade++;
else if (score>=60)
    dGrade++;
else fGrade++;
    
```

4. Consider the following questions

a. How many data members and member functions(method) in objD? (5%)

b. Suppose we rewrite the program

```
class B:public A{...} as class B:virtual public A{...}
```

```
class C:public A{...} as class C:virtual public A{...}
```

How many data members and member functions(method) in objD? (5%)

<pre> class A { protected: int dataA; }; class B:public A { protected: int dataB; }; class C:public A { protected: int dataC; </pre>	<pre> class D:public B, public A { protected: int dataD; public: void SetData(...); void DisplayData(...); }; D objD; </pre>
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本試題雙面印製

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5. Suppose the *Location* class will to initialize the value of members.

```
class Location
{
    protected:
        int x=0; // initialize x to zero
        int y=0; // initialize y to zero
};
```

- What's wrong with this class? (5%)
- Correct the errors in this class. (5%)

6. Print out the result of the following program. (10%)

<pre>#include <iostream> using namespace std; class A { public: A(){cout<<"A"<<endl;} ~A(){cout<<"~A"<<endl;} };</pre>	<pre>class B:public A { public: B(){cout<<"B"<<endl;} ~B(){cout<<"~B"<<endl;} }; int main() { B *ptrB = new B; delete ptrB; return 0; }</pre>
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7. Consider the following questions

- Use "template" to rewrite the program, programmer can specify the data type of queue at declaration. (15%)
- Declaring two queues, one is to store the integer, and the other is to store the floating. (5%)

<pre>class queue { private: int q[QUEUE_SIZE]; int front; int rear; int flag; public: queue(void); void Insert(int); int Delete(void); }; queue::queue(void): front(0), rear(0), flag(0) { }</pre>	<pre>void queue::Insert(int data) { if (front == rear && flag == 1) return; rear = (rear + 1)%QUEUE_SIZE; flag = 1; q[rear] = data; } int queue::Delete(void) { if (front == rear && flag == 0) return NULL; front = (front + 1)%QUEUE_SIZE; flag = 0; return q[front]; }</pre>
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87-3

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本試題共 3 頁，8 大題

8.

```

#include <iostream>
using namespace std;
class Human
{
protected:
    char name[30];
public:
    Human(void);
    Human(char *);
    void Speak(void);
};
Human::Human(void)
{
    strcpy(name, "NoName");
}
Human::Human(char *n)
{
    strcpy(name, n);
}
void Human::Speak(void)
{
    cout<<"My name is "<<name<<endl;
    cout<<"I am a human"<<endl;
};
Girl::Girl(char *n):Human(n)
{
}
void Girl::Speak(void)
{
    cout<<"My name is "<<name;
    cout<<" , I am a girl"<<endl;
}

class Boy : public Human
{
public:
    Boy(char *);
    void Speak(void);
};
Boy::Boy(char *n):Human(n)
{
}
void Boy::Speak(void)
{
    cout<<"My name is "<<name;
    cout<<" , I am a boy"<<endl;
}
class Girl : public Human
{
public:
    Girl(char *);
    void Speak(void);
}
void WhoAreU(Human &);
void WhoAreU(Human &speaker)
{
    speaker.Speak();
}
int main(void)
{
    Boy John("John");
    Girl Ana("Ana");

    WhoAreU(John);
    WhoAreU(Ana);
    return 0;
}
    
```

- a. Print out the output. (10%)
- b. Using pure virtual function to rewrite this program, let the output should be: (10%)
 - My name is John, I am a boy*
 - My name is Ana, I am a girl*