

科目：程式設計 (以 C 和 C++ 為主)

適用：資工系二

編號：312

考生注意：
1. 依次序作答，只要標明題號，不必抄題。
2. 答案必須寫在答案卷上，否則不予計分。
3. 限用藍、黑色筆作答；試題須隨卷繳回。

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一、是非題 (每題 5%)

1. Consider a string defined as

```
const char name[] = "Julia Roberts";
```

The string length `strlen(name)` will be 14 because you need to count the end-of-string character (`\0`).

2. In C++ language, if class A is a friend class of class B, and class B is a friend class of C, then A can access the private members of B.

二、程式題 (每題 10%)

1. What will the following code display?

```
// modulus
#include <iostream>
using std::cout;
using std::endl;

int mod(int a, int b)
{
    do    a -= b;
    while (a >= b);
    return a;
}
```

```
int main()
{
    cout << mod(624,17) << endl;
    return 0;
}
```

2. Determine whether the following code has syntax errors or not. If it is correct, predict its output. If it is incorrect, point out the mistake(s).

```
// Caesar Cipher
#include <iostream>
using std::cout;
using std::endl;

void encrypt(char* a, int key)
```

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```
{
    while (*a)
    {
        if (*a >= 'A' && *a <= 'Z')
            *a = (*a - 'A' + key) % 26 + 'A';
        a++;
    }
}

int main()
{
    char msg[] = "HELLO NCNU";
    encrypt(msg, 3);
    cout << msg << "\n";
    return 0;
}
```

3. Determine whether the following code has syntax errors or not. If it is correct, predict its output. If it is incorrect, point out the mistake(s).

```
// Structure
#include <iostream>
using std::cout;

struct Rectangle
{
    int left;
    int top;
    int right;
    int bottom;
};

int main()
{
    Rectangle R1(0,0,10,20);
    int area =
        (R1.right - R1.left) * (R1.bottom - R1.top);
}
```

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```
cout << area << "\n";  
return 0;  
}
```

4. Determine whether the following code has syntax errors or not. If it is correct, predict its output. If it is incorrect, point out the mistake(s).

```
// Copy Constructor  
#include <iostream>  
using std::cout;
```

```
class CBox
```

```
{
```

```
public:
```

```
int volume;
```

```
char* color;
```

```
CBox(int v, char* c) = "Violet": volume(v)  
{
```

```
color = new char[strlen(c) + 1];
```

```
strcpy(color, c);
```

```
}
```

```
CBox(const CBox& b)
```

```
{
```

```
color = new char[strlen(b.color) + 1];
```

```
strcpy(color, b.color);
```

```
volume = b.volume;
```

```
}
```

```
};
```

```
int main()
```

```
{
```

```
CBox cigar(10);
```

```
CBox chocolate(cigar);
```

```
cout << chocolate.color << "\n";
```

```
return 0;
```

```
}
```

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5. What will the following code display?

```
#include <iostream>
int main() // bitwise operators.
{
    unsigned s = 555;
    int i = (s >> 4) & (~0 << 3);
    std::cout << i;
    return 0;
}
```

6. Determine whether the following code has syntax errors or not. If it is correct, predict its output. If it is incorrect, point out the mistake(s).

```
// Copy Constructor in a Derived Class
#include <iostream>
using std::cout;

class CBox
{
public:
    int volume;

    CBox() { volume = 10; }
};

class CContainer : private CBox
{
    char* color;

public:
    CContainer()
    {
        color = new char[strlen("Pink")+1];
        strcpy(color, "Pink");
    }
}
```

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```
CContainer(CContainer& b)
{
    color = new char[strlen(b.color)+1];
    strcpy(color, b.color);
}

void ShowColor()
{
    cout << color<< "\n";
}
};
```

```
int main()
{
    CContainer cigar;
    CContainer chocolate(cigar);
    chocolate.ShowColor();
    return 0;
}
```

7. Determine whether the following code has syntax errors or not. If it is correct, predict its output. If it is incorrect, point out the mistake(s).

```
// Operator Overloading
#include <iostream>
using std::cout;

class CList
{
public:
    int count;

    void Print() { cout << count << "\n"; }
    CList(int l) : count(l) {}
    CList& operator++() { count++; return *this; }
    CList operator++(int)
    { count<<=1; return *this; }
};
```

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```
int main()
{
    Clist L2(5);
    ++L2; L2.Print();
    return 0;
}
```

8. Determine whether the following code has syntax errors or not. If it is correct, predict its output. If it is incorrect, point out the mistake(s).

```
#include <iostream>
using std::cout;
using std::endl;
```

```
// This function returns a pointer to an integer
int *max(int a, int b)
{
    return (a>b) ? &a : &b;
}
```

```
int main()
{
    cout << *max(3,5) << endl;
    cout << *max(10,1) << endl;
    return 0;
}
```

9. Determine whether the following code has syntax errors or not. If it is correct, predict its output. If it is incorrect, point out the mistake(s).

```
// Friendship
#include <iostream>
using std::cout;

class CBox
{
private:
    int volume;
}
```

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```
public:
    CBox() : volume(20) {}
    friend main();
};

int main()
{
    CBox b1;
    cout << b1.volume << "\n";
    return 0;
}
```

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