

科目：程式設計 適用：資工系二

編號：311

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。

本試題
共 5 頁
第 1 頁

一、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(628, 7) << 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)
{
    while (*a)
    {
        if (*a >= 'A' && *a <= 'Z')
            *a = (*a - 'A' + key) % 26 + 'A';
        a++;
    }
}

int main()
{
    char msg[] = "HELLO NCNU";
    encrypt(msg, 10);
    cout << msg << "\n";
    return 0;
}
```

科目：程式設計 適用：資工系二

編號：311

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。

本試題

共 5 頁

第 2 頁

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).

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

class CQueue
{
public:
    CQueue() // Default Constructor
    {
        head = tail = 0;
    }
    void push(int i)
    {
        a[tail++] = i;
    }
    int pop()
    {
        return a[head++];
    }
private:
    #define QueueSize 10
    int a[QueueSize];
    int head, tail;
};

int main() {
    CQueue q;
    q.push(3); q.push(2);
    q.pop(); q.push(6);
    cout << q.pop() << "\n";
    return 0;
}
```

4. What will the following code display?

```
#include <iostream>
int main() // bitwise operators.
{
    unsigned s = 628;
    int i = (s >> 4) & (~0 << 3);
    std::cout << i << "\n";
    return 0;
}
```

科目：程式設計 適用：資工系二

編號：311

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。

本試題

共5頁

第3頁

5. 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;
}
```

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).

```
#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(62,8) << endl;
  return 0;
}
```

科目：程式設計 適用：資工系二

編號：311

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。

本試題

共 5 頁

第 4 頁

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).

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

float average(float a, float b);
float average(float a, float b, float c); //
overloading

int main()
{
    cout << average(1.0, 5.2, 7.0) << "\n";
    cout << average(4, 0, 5.0) << "\n";
    return 0;
}

float average(float a, float b)
{ return (a+b)/2.0; }

float average(float a, float b, float c)
{ return (a+b+c)/3.0; }
```

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).

```
// Pointer to char
#include <iostream>
#include <string.h>
using std::cout;
using std::endl;

int main()
{
    char s[] = "The Stars, Like Dust";
    char *p1, *p2;
    char c;

    cout << s << endl;

    for (p2=s; *p2 != '\0'; p2++);
    p2--;
    p1=s;
    while (p1 < p2)
    {
        c = *p1; *p1 = *p2; *p2 = c;
        p1++; p2--;
    }

    cout << s << endl;
    return 0;
}
```

科目：程式設計 適用：資工系二

編號：311

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。

本試題

共5頁

第5頁

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).

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

int main()
{
    int i, n = 628;
    for (i=1; i<7; i++)
    {
        int n = 0;
        for (int j=1; j<=i; j++)
            n += j; // scope of variable n
        cout << n << "\n";
    }
    cout << n << "\n";
    return 0;
}
```

10. 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;
public:
    CBox() : volume{20} {}

friend int main();
};

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