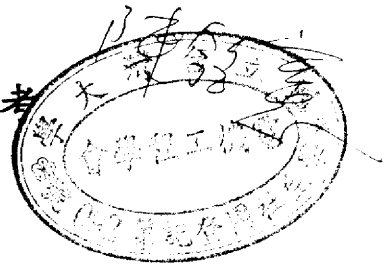# 計算機程式　期中考

1. (10 %) Write single C++ statements that

    (a) Input integer variable x with cin and >>.

    (b) Initialize integer variable power to 1.

    (c) Increment variable y by 1.

    (d) Test y to see if it is less than or equal to x.

    (e) Output integer variable power with cout and <<.

2. (10%) What is the output of the following code for each of the 4 cases – (i), (ii), (iii), (iv):

```
const int MALE =1;
const int FEMALE =2;
int sex, age;
cout<<" I am a";
if (age >=18)
        cout<<" super ";
        cout<<"adult. ";
if (sex !=MALE) cout<<" Well, a lady . ";
if (sex ==MALE)
{ cout<<" Well, a man. ";
    if (sex != FEMALE)
        cout<<"O.K ?";
}
```

    (i)   age=20, sex=1.

    (ii) age=20, sex=2.

    (iii) age=10, sex=1.

    (iv) age=10, sex=2.

3. (10%) What is printed by the following program fragment ? (All variable are of type int.)

```
for (row=1;row <=10;row++)  {
    for (col=1;col<=10-row;col++)
        cout<<col;
    for (col=1;col<=2*row-1;col++)
        cout<<row;
    for (col=1;col<=10-row;col++)
        cout<<col;
    cout<<endl;
}
```

4. (10%) What is the output of the following code ?

```
for (j=9;j>=0;j--) {
    i=10-j;
    while ( --i ){
        cout<<i+j;
    }
    cout<<endl;
}
```

5. (10%) What is the output of the following code ?

```
void test(int&, int);
int main()
{
    int a;
    int b;
    a=4,b=3;
    test(a,b);
    b+=10;
    test(b,a);
    cout<< from main: a="<<a<<";b="<<b<<endl;
    return 0;
}
void test(int& b,int a)
{
    b+=4;
    a+=2;
    cout<<"from test: a="<<a<<";b="<<b<<endl;
}
```

6. (10%) What is the output of the following code ?

```
#include <iostream.h>
int fun1(void);
int fun2(void);
int fun3(int *);
int val=10;

int main()
{
    int val=0;
```

```cpp
    for (int i=0; i<3; i++) {
        val += fun1() + fun2() +fun3(&val);
    }
    cout << "val = " << val << endl;
    return 0;
}


int fun1(void)
{
    static int val=1;
    val += 2;
    return val;
}


int fun2(void)
{
    val += 2;
    return val;
}


int fun3(int *num)
{
    int val=2;
    int &cnt = val;
    *num -= (cnt >= *num ? cnt : *num);
    return val;
}
```

7. (10%) What is the output of the following code ?

```cpp
void ZeroOut(int [], int);
void PT(int [],int, int);
int main()
{
    int rel[6]={15,12,7,15,6,14};
    PT (rel,1,5);
    ZeroOut(rel+2,3);
    PT(rel+1,1,4);
    Return 0;
}
```

```cpp
void ZeroOut( int arr[], int n)
{
    int i;
    for (i=n-1;i>=0;i--)
       arr[i]=0;
}
void PT(int arr[], int x, int y)
{
    int i;
    for (i=x;i<x+y;i++)
        cout<<arr[i];
        cout<<endl;
}
```

8. (20%) What is the output of the following code ?

```cpp
int dance(int&, int);
int x;
int main()
{
    int y, z;
    x=6;
    y=x+2;
    z=y+3;
    y=x+dance(z,y);
    cout<<"x="<<x<<"y="<<y<<"z="<<z<<endl;
    z=z+dance(y,z);
    cout<<"x="<<x<<"y="<<z<<"z="<<y<<endl;
}
int dance(int& y, int z)
{
    x=(++y)+(--z);
    cout<<"x="<<x<<"y="<<y<<"z="<<z<<endl;
    return z;
}
```

9. (20%) What is the output of the following program ?

```cpp
#include <iostream.h>
int mystery(int, int)
int a[]={16,18,5,7,1,31,62,9,11};
int main()
{
    mystery(a,0,8);
    cout <<a[7]<<endl;
    cout<<a[2]<<endl;
    cout<<a[4]<<endl;
    return 0;
}

void mystery (int v[], int x, int y)
{
    int i,z;
    void swap(int v[], int, int);
    if (x >= y) return;
    swap(v, x, (x+y)/2);
    z = x;
    for (i=x+1; i<=y; i++)
        if (v[i]<v[x]) swap(v, ++z, i);
    swap(v, x, z);
    mystery(v, x, z-1);
    mystery(v, z+1, y);
}
void swap(int v[], int i, int j)
{
    int temp;
    temp = v[i];
    v[i] = v[j];
    v[j] = temp;
}
```