所別：電機工程學系碩士班 甲組(一般生) 科目：計算機概論
甲組(學位在職生)

1. Please identify the following items as "Hardware" or "Software" (10%)
   (1) Windows operating system is (a) hardware (b) software.
   (2) 32-bit CPU is (a) hardware (b) software.
   (3) DDR memory is (a) hardware (b) software.
   (4) Text editor is (a) hardware (b) software.
   (5) C++ compiler is (a) hardware (b) software.
   (6) Java language is (a) hardware (b) software.
   (7) Internet navigator is (a) hardware (b) software.
   (8) Linux operating system is (a) hardware (b) software.
   (9) Flash memory is (a) hardware (b) software.
   (10) 8051 micro-controller is (a) hardware (b) software.

2. Show the results of the program? Note that the data type of "b" is declared as an integer. (5%)

```cpp
#include <iostream>

using namespace std;

int main()

{
 int b;
 for (int a = 1; a <= 3; a++)
 {
  b = (a + 2)/a;
  cout << "(" << "a+2)" << "/" << "a";
  cout << "=" << b << endl;
 }
 return 0;
}
```

3. What does the following program do? (5%)

```cpp
#include <iostream>

using namespace std;

int main()

{
 int x=6, y=3;

 if ( x >= 5)

 if ( y >= 5)

 cout << "x and y are >= 5."<<endl;

 else

 cout << "x is < 5."<<endl;

 return 0;
}
```

4. Observe the regularity of the following figure. In the first line, you have to print "1 1". In the second line, you print "1 2 1". Each number is separated by one space. Write a C/C++ function to derive 15 lines of such results by using loop commands. Note that you can not calculate the results by hands and simply print it out. (10%)

```
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
....
```

5. Write a C/C++ function to calculate the number of grids (x,y), where x and y is an integer, enclosed in the area Y>0 and

   $Y < -X^2 + 8X$. (10%)

6. Write a **do/while** loop that sums all the numbers between 1 and 100, inclusive, except for 20 and 60. Print the sum. (10%)

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7. What's the result of the following program? (5%)

```cpp
#include <iostream>
using namespace std;

void Change(int &);

void main ( )
{
  int   x = 10;
  int &y = x;

  cout<<"x="<<x<<endl<<"y="<<y<<endl;
  Change(y) ;
  cout<<"x="<<x<<endl<<"y="<<y<<endl;
  return;
}

void Change(int &a)
{

  a=--a;

  return;

}
```

8. What's the result of the following program? (5%)

```cpp
#include <iostream>
using namespace std;

void Update(int);
void Modify(int &);

void main ( )
{
  int   x = 3;
  int   y = x;

  cout<<"x="<<x<<endl<<"y="<<y<<endl;
  Update(y) ;
  cout<<"x="<<x<<endl<<"y="<<y<<endl;
  Modify(y) ;
  cout<<"x="<<x<<endl<<"y="<<y<<endl;
  return;
}

void Update(int a)
{

  a=a++;

  return;

}

void Modify(int &b)
{

  b=b*10;

  return;

}
```

9. Write a program that computes and prints the average of the odd integers between 1 and 31, inclusive. Print the number as a fixed decimal with eight digits of precision. (10%)

注意：背面有試題

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10. Identify and correct the errors of the following code to print the values 1 to 10. (5%)

```
n = 1;
do  {
        cout << n++ << " ";
} while (n < 10);
cout << endl;
```

11. Identify and correct the error of the following definition for the class **Time**: (5%)

```
class Time {
    public:
        Time( int = 0, int = 0, int = 0 );
        void setTime( int, int, int );
        void printUniversal();
        void printStandard();
    private:
        int hour;
        int minute;
        int second;
} // end class Time
```

12. What is output from the following program segment? (5%)

```
int x;
for ( x = 0; x <= 30; x++ ) {
    if ( x = = 5 )
        continue;
    if ( x = = 15 )
        break;
    cout << x << " ";
}
cout << endl << "The final value of x is: " << x << endl;
```

13. What is output by the following program segment? (5%)

```
int a[ ] = {11, 22, 33, 44, 55, 66, 77, 88, 99};
int *ptr = &a[1];
cout << a[5] << " " << *(ptr + 5) << " " << ptr[5];
```

14. Function floor can be used to round a number to a specific decimal place. The statement

$$Y = floor(x*10 + 0.5)/10;$$

round x to the tenths position (the first position to the right of decimal point). Please write a function round2binary(number, b) for a finite word-length digital circuit. This function rounds a number to the b-th bit position to the right of binary point. (10%)