答題須知：請詳細閱讀下列試題，並請標明題號依試題順序將答案書寫於答案卷上。

一、問答題（55%）

1. In the positional number system, please define a polynomial expression to present a number system with base of 7, **S** is the set of symbols, *k* symbols for the integer part, and *l* symbols for the fractional part. (5 points)

2. $(1911.5)_{10}$ -> $(???)_8$ (5 points)

3. The bit pattern $(11001010000000000111000100001111)_2$ is stored in Excess_127 format. Show the value in decimal. (5 points)

4. $(A3B)_{16}$ XOR $(B99)_{16}$ = $(???)_{16}$ (5 points)

5. Please draw a computer with the three sub-systems and interconnections. (5 points)

6. int a,b; a=3; b=a++; what is the value of b after running of this three-lines code? Explain? (5 points)

7. Please explain what is a recursive function? (5 points)

8. Please explain what is DMA? (5 points)

9. Why we need 7 layers in Internet system? Which layer that HTTP belongs to and why? (5 points)

10. What is the different between "object" and "class" in OOP language? (5 points)

11. What is the different between "overloading" and "overriding" in OOP language? (5 points)

二、程式設計題（45%）

Use C, C++ or Java to answer the following questions. Note that you cannot use any library functions except basic I/O functions in your programs.

1. Please write a function called int GCD(int a, int b), that will return the Greatest Common Divisor of a and b. (15 points)

2. Please write a function called int No1Bits(int x), that will return the number of 1 bits in representing binary format of x. (15 points)

3. Please write a function called in int SumofPrime(int n), that will sum up all prime numbers that are smaller or equal to n. And return the sum. (15 points)