編號： 152　系所：工程科學系乙組　　科目：計算機概論

本試題是否可以使用計算機：☐可使用 ，☑不可使用 （請命題老師勾選）

1. Terminology: (Detail description please) (15%)
   (a.) **Polymorphism** (in Object Oriented Programming).
   (b.) **Name mangling** (in function overloading)
   (c.) **Dynamic Binding** (in programming language)

2. Please rewrite the code segment shown below in a **while** statement and a **for** statement in C++ : (15%)

```
total = 0 ;
do {
    cin >> grade;
  if ( grade != -1)
    total += grade ;
} while ( grade != -1 ) ;
```

3. What are the basic components in a modern CPU? Please draw a figure and then describe in detail the functionalities of each component. (15%)

4. What is the relationship between the cache memory and the CPU in a modern computer? (10%)

5. How do you represent -60 in 1's and 2's complement format? Please compute the results of -60 + 60 in both formats and show the differences. (10%)

6. If you are designing a hard disk system, what would you do to shorten the access time and what price would you pay for the increase of the performance? (10%)

7. Pleases write a recursive function **int gcd(int x, int y)** in C++ to find out the **GCD** (greatest common divisor) of its two arguments (you must use iterative dividing method). (10%)

8. What are the differences between a **File System** and a **Network File System (NFS)**? Please describe in detail what sort of extra functionalities a **NFS** should have to make it work properly? (15%)