1. (20 分) Briefly explain the following terms
   (a). SOC
   (b). Interrupt handle vector
   (c). IP address
   (d). Disk array and RAID
   (e). FPGA

2. (15 分) 選擇題（答對得 3 分，答錯扣除 1 分）
   (1). Which of the following enables different computers on different networks to communicate with each other?
      A. modems
      B. internet services provider
      C. TCP/IP software
      D. FTP

   (2). Which of the following refers to the execution of two or more programs by multiple computers?
      A. multiprocessing
      B. multitasking
      C. time-sharing
      D. multiprogramming

   (3). Which of the following is distributed free of charge but requires users to make a contribution later on?
      A. public domain software
      B. shareware
      C. freeware
      D. proprietary software

   (4). Disk storage is usually measured in Giga bytes. Roughly how many bytes of information can be stored in a 4G hard disk?
      A. 40,000,000
      B. 400,000,000
      C. 4,000,000,000
      D. 40,000,000,000

   (5). A motion control requires at least 1MHz sampling rate. Which of the following processing time is required for handling the motion control computation?
      A. < 1ms
      B. < 1us
      C. < 1ns
      D. < 1ps
3. (10分) Give the output from the following program. Use '_' for a space.

```c
void function(int* a, int b)
{
    int *temp;
    (*a)++; 
    -b; 
    temp = a;
    (*a) = b;
    (*temp)++; 
    (*a)++; 
}
```

```c
void main()
{
    int i = 10;
    int j = 'E'-'A';
    int *ptr = &i;
    printf("i = %d and j = %d
", i, j);
    function(&i, j);
    printf("i = %d and j = %d
", i, j);
    printf("sptr = %p and "sptr = %d
", "sptr", "sptr");
}
```

4. (20分) 简答题

(a) Compare Windows and Linux as an operating system.

(b) How to present the number fifty five in a number system that uses 5 as the base?

(c) Briefly explain the differences between polling I/O and interrupt-driven I/O.

(d) One claims that “A 2GHz Pentium-IV is four times faster than a 500MHz Pentium!” Do you think the argument is correct or not? Why?

5. (20分) If we would like to build a traffic light control system (紅綠燈號誌), describe how you construct the system by using a microcontroller with 3 LED’s (red, green, yellow). Give the hardware diagram and corresponding software control modules.

6. (15分) Internet

(a) Give a diagram to show the basic idea how web services over internet work.

(b) Explain what HTML is and how web pages can be linked in browsing.

(c) Explain why JAVA programs can be employed in web pages and be executed regardless of machine types.