

國立中正大學九十學年度碩士班招生考試試題

系所別：機電光整合工程研究所

科目：計算機概論

1. (20分) Briefly explain the following terms

- (a). ROM
- (b). DMA
- (c). Internet
- (d). Domain name
- (e). Timer

2. (10分) It is estimated that there are less than 20,000 Chinese characters that are listed in any dictionary. Suppose we want to encode all of these characters in computer memory, at least how many bytes are needed to encode a character? Explain your answer.

3. (20分) A microprocessor (or CPU) that can compute $A = (B+C)/2$

- (a) Give a diagram to show the basic organization of a microprocessor and explain the function of each component.
- (b) Define a set of instructions that are commonly used in normal processors.
- (c) Use instructions defined in (b) to explain how the statement is executed in your processor organization of (a).

4. (12分) Give the output from the following program.

```
void swap_and_inc_dec(int* a, int* b)
{
    int *temp;
    temp = a;
    a = b;
    b = temp;
    *a += 1;
    *b -= 1;
}
```

```
void main()
{
    int i = 10;
    int j = 5;
    int *iptr = &i;
    int *jptr = &j;

    swap_and_inc_dec(iptr, jptr);
    printf("i = %d and j = %d\n", i, j);
    printf("*iptr = %d and *jptr = %d\n", *iptr, *jptr);
}
```

5. (18分) 選擇題 (答對得3分, 答錯倒扣1分)

- (a). Which of the following has the slowest access speed?
 - A. Main memory
 - B. Cache memory
 - C. Hard disk
 - D. CD-ROM

艾上夏 P1

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- (b). Which of the following is not an operating system?
- A. Linux
 - B. Windows 2000
 - C. Netscape 4.6
 - D. Windows NT
- (c). Disk storage is usually measured in Giga bytes. Roughly how many bytes of information can be stored in a 40G hard disk?
- A. 40,000,000
 - B. 400,000,000
 - C. 4,000,000,000
 - D. 40,000,000,000
- (d). How to present the number sixteen in a number system that uses 7 as the base?
- A. 1000
 - B. 110
 - C. 22
 - D. 16
- (e). What kind of system tool do you need in order to translate a source program into executable machine code?
- A. Internet browser
 - B. Compiler
 - C. Operating system
 - D. Debugger
- (f). Let $f(n) = 1$ for $n = 1, 2,$ and $3,$ and $f(n) = f(n-1) + f(n-2) + f(n-3)$ for all n greater than $3.$ What is the value of $f(7)$?
- A. 17
 - B. 21
 - C. 19
 - D. 31

6. (20分) 簡答題

- (a). What are differences between DRAM and SRAM?
- (b). Briefly explain the difference between parallel port and serial port in PCs.
- (c). If a microprocessor does not support interrupt, argue why the following features are possible or infeasible.
- A. I/O
 - B. Timer
 - C. Disk access