

1. Please briefly explain the following terminologies.(9%)
  - a. bit, byte, word, record, file.
  - b. software, hardware, firmware.
  - c. DRAM, SRAM, EPROM.
2. Given  $A = 6556_7$ ,  $B = 0124_7$ ,  $C = 0045_7$ , please calculate  $(A-B \cdot C)$  and represent the result by hexadecimal number.(6%)
3. In general, what are the differences among *MDA*, *CGA*, *EGA*, *VGA*, and *Super VGA* on PC? (5%)
4. Please give at least THREE reasons why Chinese is unfavorable for word processing compared to English. (5%)
5. Please draw a diagram to describe the *client-server* database structure. (5%)
6. Programming: please use either *C/C++*, *BASIC*, *PASCAL*, or *FORTRAN* languages to write the following programs.
  - a. Design a program to find the Armstrong Number between 1 and 65535. (15%)

Armstrong number:  
An integer number with n digits equals to the sum of each digit's n power

Ex: 153 is 3 digits (n=3)  
 $153 = 1^3 + 5^3 + 3^3$
  - b. Design a recursive function for finding the Factorial number  $N!$ . (5%)
  - c. Design a program to find all the prime numbers smaller than N. (15%)
7. Given the array A,  $A = \{76, 88, 46, 20, 41, 97, 38, 98\}$ , what would be the A array after performing THREE passes of:
  - a. Bubble sort (5%)
  - b. Straight selection sort (5%)
  - c. Quick sort (5%)technique in ASCENDING order.

8. Consider the following linked list whose head is in item B

No.	Data	Pointer to next item	Pointer to previous item
1	A	3	5
2	B	7	0(null)
3	C	6	1
4	D	0	6
5	E	1	7
6	F	4	3
7	G	5	2
8			

Assume that item F is deleted logically from the table, then an item H is added physically to the bottom of the list and inserted logically between items A and C. What would the table be after the insertion is completed? (10%)

9. The following expression is written in prefix form:

$/-*+ABC-DE+FG$

- Write the infix form of the expression above. (5%)
- Use binary tree to represent the infix expression. (5%)