大同大學 九十三 學年度 轉學考試 試題

考試科目：程式設計　系別：資訊經營學系　　第 一 頁，共 一 頁

註：本次考試不可以參考自己的書籍及筆記；　不可以使用字典；　不可以使用計算器。

1. (4 %) Explain the difference in internal implementation between a string constant "A" and a character constant 'A'.

2. (10 pts) Evaluate the following expressions; assume each value is 1 byte.
   a) `3 & 6`　　b) `2 | 4`　　c) `2 && 4`　　d) `7 >> 1`　　e) `3 || 6`

3. (10 pts) Consider the following macro definitions, what is the result for each statement below?
```
#define  SUM(x, y)        x + y
#define  PRODUCT(x, y)    (x * y)
```
   a) `ans = 10 * SUM(2, 5);` _____　　b) `ans = PRODUCT(2+3, 4);` _____.
   If any of them is not what you expected, how do you fix its corresponding definition above?

4. (6 %) Given the following array declaration: `static int arr[2][3] = {{3, 4, 5}, {6, 7, 8}};`
   refer to the element occupied by the number 7 in **array** notation and then in **pointer** notation.

5. (10 pts) We try to compute n!. What's wrong with the following function? How about replacing `n--` with `--n`?
```
int factorial(int n)
{
   if (n <= 1)
      return 1;
   else
      return n * factorial(n--);
```

6. (9 %) 完成底下字串比較(lexicographically)函式。其視 s 小於、等於、或大於 t 將回傳負值、零、或正值。
```
int strcmp(char *s, char *t)
{
   while (*s++ == *t++)
         if  ________________    (1)
             ________________    (2)
   return    ________________    (3)
}
```

7. (8 %) 若宣告 `char s2[] = "I am in exam now";` 底下各式之輸出結果為何?
   (1) `printf("%s", s2);`　　(2) `printf("%s", &s2[0]);`
   (3) `printf("%s", s2+5);`　　(4) `printf("%c", *(s2+5));`

8. (10 %) 試舉一例說明 C 語言之 *call by value* 和 *call by reference* 之不同。

9. (21 pts) 底下 (a) 和 (b)完成定義及宣告，(c)～(g) 找出錯誤並更正。
   a) Define a structure called `card` containing two pointers to type `char`, namely `face` and `suit`.
   b) Declare variable `c` to be of type `struct card` and variable `cPtr` to be of type pointer to `struct card`.
   c) Assume that variable `cPtr` has been assigned the address of `c`.
```
printf( "%s\n", *cPtr->face );
```
   d) Assume that the array `hearts[13]` has been defined to be of type `struct card`.
   The following statement should print the member `face` of element 10 of the array?
```
printf( "%s\n", hearts.face );
```
   e)
```
struct person {
   char lastname[ 15 ];
   char firstname[ 15 ];
}
```
   f) Assume `struct person` has been defined as in part (e) but with the appropriate correction.
```
person d;
```
   g) Assume variable `p` has been declared as type `struct person` and `c` has been declared as type `struct card`.
```
p = c;
```

10. (12 pts) 解釋抽象資料型態(*abstract data type*)、資訊隱藏(*information hiding*)與封裝(*encapsulation*)；並說明 C++ class 與 C struct 有何相似及不同之處，C++是如何達成 information hiding 和 encapsulation 的。