中山大学软件学院 2011 级软件工程专业 （2011 学年秋季学期）

《SE-122 程序设计 I》期末试题(A 卷)

(考试形式：闭　卷　　考试时间：2 小时)

警示

《中山大学授予学士学位工作细则》第六条

考试作弊不授予学士学位

方向：_____　　姓名：_____　　学号：_____

Section I:　Single Choice (20 points)

For each of the following questions, choose only ONE of the provided multiple choices: A, B, C and D, corresponding to the best answer for them.

1. (2 points) Which one of the following variable names is valid in C?

(A) M.Jordan　　(B) char

(C) 2F　　(D) _b2c

2. (2 points) There are statements as follows.

```
1   int a[3]={3,2,5}, *p=a, b=4;
2   float x=1.3;
3   printf("%d", ((*a+b)%((int)x++)==0)?*p++/2:b%5);
```

What is the output of the printf statement?

(A) 1;　　(B) 2;　　(C) 3;　　(D) 4;

3. (2 points) Given the following statement, which one of following assertions is NOT correct?

```
1   char *s="Programming";
```

(A) Variable s stores the address of char 'P'.　　(B) s[0] stores char 'P'.

(C) *s stores char 'P'.　　(D) s stores a string.

4. (2 points) Suppose we have the following definition.

```
2   int a, *pa=&a;
```

Which of the following statements can read the value correctly into a?

(A) scanf("%d", pa);　　(B) scanf("%d", a);

(C) scanf("%d", &pa);　　(D) scanf("%d", *pa);

5. (2 points) What is the value of *(*p+1)+3 after the following code segment is executed?

```
1   int a[3][5] = {{1,2},{6,4},{3,4,5}};
2   int (*p)[5] = a;
```

(A) 0　　(B) 4　　(C) 5　　(D) 6

6. (2 points) Definition of **ptr** is as follows.

```
float a[6], *ptr = a;
```

If the value of ptr is 2000， after expression ptr=ptr+1 is executed, what is the value of ptr? Assume that the size of a float data type is 4 bytes.

(A) 2001 (B) 2004 (C) 2006 (D) 2008

7. (2 points) Which of the following statements can NOT assign a string “hello!” to a char array s?

(A) char s[10]={‘h’, ‘e’, ‘l’, ‘l’, ‘o’, ‘!’, ‘\0’}; (B) char s[10]; s = “hello!”

(C) char s[10]; strcpy(s, “hello!”); (D) char s[10]=”hello!”;

8. (2 points) Which of the following statements is NOT true?

(A) Local variable can be defined inside a function body.

(B) Global variable can be defined at any place outside a function body.

(C) Global variable and local static variable have different storage durations.

(D) Local automatic variable and local static variable have the same scope.

9. (2 points) If bubble sort is applied on the array {3,6,4,9,5,8,1} (in ascending order), what is the intermediate result after the first scan of the whole array?

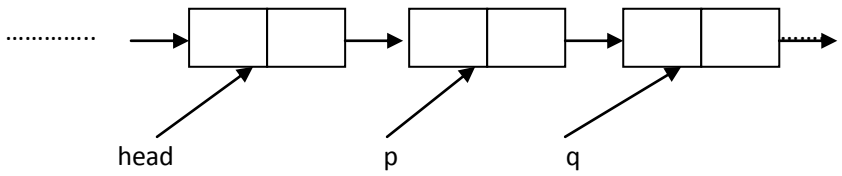
(A) {3,4,6,5,8,1,9} (B) {3,4,6,5,1,8,9}

(C) {9,8,6,5,4,3,1} (D) {9,8,6,5,4,3,1}

10. (2 points) Suppose we have the following node definition and declarations.

```
1   struct node{
2      int key;
3      struct node *next;
4   } *head, *p, *q;
5
```

head, p and q point to the three adjacent nodes, shown as following:



Which of the following statements can switch the nodes p and q points to?

(A) head->next = q; p->next = q->next; q->next = p;

(B) q->next = p; p->next=q->next; head->next =q;

(C) head->next=q; q->next=p; p->next = q->next;

(D) q->next = p; head->next=q; p->next = q->next;

Section II: Short Answer (40 points)

Briefly answer the questions according the requirements.

1. (8 points) (1) Explain the difference between "call by value" and "call by reference" with a small example;

(2) Explain the difference between struct and union with a small example.

2. (8 points) The following program is to read the input until it gets 10 positive integers, and then output the average of all positive integers. Write ONE C statement in each blank to complete the program.

```
1. #include <stdio.h>
2.
3. int main()
4. {
5.    int a, sum=0, count=0;
6.    while ( ____(1)____)
7.    {
8.       scanf( "%d", &a);
9.       if( a <= 0 ) ___(2)___;
10.      sum += a;
11.      ___(3)___;
12.   }
13.   printf( "The average is %f", ___(4)___ );
14.
15.   return 0;
16. }
```

3. (6 points) The function print_pyramids takes an odd integer x and prints a character pyramids like the following (i.e. x = 7):

```
   A          /* 1st line: 3 spaces + A + Enter */
  AAA         /* 2nd line: 2 spaces + 3As + Enter */
 AAAAA        /* 3rd line: 1 space + 5As + Enter */
AAAAAAA       /* 4th line: 7 As + Enter */
```

Fill in the blanks in the function body.

```
1   void print_pyramids( int x ){
2     int i,j,mid = x / 2 + 1;
3     for( i = 0; i < mid; i++){
4       for(__(1)__) printf(" ");
5       for(__(2)__) printf("A");
6       printf("\n");
7     }
8   }
```

4. (8 points) Write the function ***int count_digits(const char*)*** to count the number of digits in a string. For example, if "a2sr34sd4" is passed into the function, 4 will be returned.

5. (10 points) Write a function ***void print_binary(int)*** that takes an integer as the input and prints its binary format. For example, if 18 is passed into the function, "10010" will be returned.

Section III: Program Output Analysis (20 points)

Write the result after executing the following programs or program fragments.

1. (6 points) What are the outputs of the execution of the following C program?

```
#include<stdio.h>
void foo(int x){
   if( x > 0 ){
        printf("%d", x%2);
       foo(x/2);
   }
}
int main()
{
    foo(1028);
    return 0;
}
```

2. (6 points) What are the outputs of the execution of the following C program?

```
#include <stdio.h>

void foo(int* a){
   static int x = 5;
   *a+=x++;
}

int main()
{
   int i, a[5]={1,1,1};
   for (i = 0; i < 5; i++)
       foo(a+i);

   for (i = 0; i < 5; i++)
      printf("%d ", a[i]);
   return 0;
}
```

3. (8 points) What are the outputs of the execution of the following C program:

```
#include <stdio.h>

int main()
{
   int a[3][4]={1,5,8,10,11,3,4,8,7};
   int *p = (int*)a;
   int (*q)[4] = a;
   p += 1;
   q += 1;
   printf("%d ", *p);
   printf("%d ", **q);
   printf("%d ", (*q)[2]);
   printf("%d ", *q+3-p);

   return 0;
  }
```

Section IV: Program Error Correction (20 points)

1. (10 points) Identify and correct the errors in each of the following statements or program fragments:

a) (3 points)

```
1. char s1[10]=”hello”;
2. const char* p = s1;
3. *(p+5)=’!’
```

b) (3 points)

```
1. char *s;
2. scanf( “%s”, s);
```

c) (4 points)

```
1. int a[5]={1, 3, 8};
2. scanf( “%d”, *(a+3) );
3. a = a+1;
4. printf(“%d”, *a);
```

2. (10 points) Identify and correct the errors in the following program.

```
1   #include <stdio.h>
2
3   int ascend(int a,int b)
4   {
5       return a<b? 0:1;
6   }
7   int descend(int a,int b)
8   {
9       return a>b? 0:1;
10  }
11
12  void sort(int *a,int n, int* cmp(int,int))
13  {
14      int i,j;
15      for(i=0;i<n;i++)
16      {
17          for(j=0;j<n-1;j++)
18          {
19              if(1==(*cmp)(a[j],a[j+1]))
20                  swap(a[j],a[j+1]);
21          }
22      }
23  }
24
25  int swap(int*a, int*b)
26  {
27      int* temp;
28      temp=a;
29      a=b;
30      b=temp;
31  }
32
33  int main()
34  {
35      int a[10] = {6,4,2,5,7,8,3,5,0,2};
36      sort(a,10,*ascend);
37      sort(a,10,*descend);
38  }
```