学号 姓名 专业班级 院系

解答内容不得超过装订线

华中科技大学 2024～2025 学年第一学期
“ C 语言程序设计 ”考试试卷（A 卷）

考试方式 闭卷 考试时间 2025 年 01 月 14 日上午 考试时长 150 分钟

题号	一	二	三	四	五	六	总分	总分人	核对人
分值	10	10	10	10	25	35	100		
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一、判断下列语句或程序段的对错。（“×”表示错，“√”表示对）（10 分）(Judge the correctness of the following statements or program segments.("×" indicates wrong, and "√" indicates correct.))

(1) struct AIA { ( )
```
    char name[30] = "Li Hua";
    int age = 20;
    }chen, gao, wang;
```
(2) double *p=0xFFE0; ( )

(3) char *p_str = "Econ"; ( )

(4) float bb[5], *p=bb; ( )
```
    *p=10.0;
```
(5) int aa[10] = {0} ; ( )

(6) int (*px)[3], x[3][5]; ( )
```
    px = x;
```
(7) register int a; ( )
```
    scanf("%d" , &a);
```
(8) char str[30]= " AIA", *ptr="ECON "; ( )
```
    strcat(str,ptr);
```
(9) float xy#1 = 80.0; ( )

(10) char *str = "\\abcd\'efg\""; ( )

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二、计算下列表达式的值（10 分）(Calculate the value of the following expressions.)

假设 unsigned int a=4, b=5; int c=3, d=6; float e=1.0;
char s1[20]="ECON", s2[20]={'A','I','A','\0','H','U','S','T'};

计算下列各表达式的值，假设 int 类型为 16 位长度，且各题彼此独立

(Suppose unsigned int a = 4, b = 5; int c = 3, d = 6; float e = 1.0;
char s1[20] = "ECON", s2[20] = {'A', 'I', 'A', '\0', 'H', 'U', 'S', 'T'};
Calculate the value of each of the following expressions, assuming that the int type is 16 bits long and each question is independent of each other.)

(1) d>>=1, a || --d, d; ( )
(2) (int)(e/d + a/c) + (int)((e+b)/c); ( )
(3) c=strlen(strcat(s2 , s1)); ( )
(4) a += (!b + a*c + 1); ( )
(5) b &=0x55AA; ( )

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三、程序改错（10 分）要求：不得改变程序框架，不得重写程序，无需文字说明，直接在代码上添加、删除和修改。(Program Debugging: Do not change the program framework, do not rewrite the program, and make additions, deletions, and modifications directly on the code without written explanations.)

(1)如下程序对已知的 5 个整数从小到大排序，其中在 main（）函数中初始化，在 ssort 函数中排序。 (The following program sorts 10 known integers in ascending order. The integers are initialized in the main() function and sorted in the ssort function.)

```
#include<stdio.h>


void    main( )
{
        int i;
        int    b[N]={888,666,999,333,777};
        ssort(b,N);
        for (i=0; i<N; i++)
        {
             printf("%s\n"，s[i])
        }
 }

 void ssort(char    *pb, int m)
{
        int i, j , k;
        char * t;
        for(i = 0 ; i < m ;    i++)
        {
             k = i;
             for(j = 0; j< m-1 ; j++)
             {
                  if(pb[k] > pb[j])    k = j ;
             }
             if(k == i);
             {
                  t = pb[k];
                  pb[k] = pb[i];
                  pb[i] = t;
             }
        }
 }
```

(2) 逐个比较 a,b 两个字符串中对应位置的字符，把 a 字符串中 ASCII 值大或等于 b 字符串中对应位置字符依次存放到 c 数组中，行成一个新的字符串，并在主函数中输出(Compare the characters at corresponding positions in the two strings **a** and **b** one by one, and store the characters in string **a** whose ASCII values are greater than or equal to the corresponding characters in string **b** into the **c** array in sequence to form a new string, and output it in the main function.)(5 分)

```
#include<stdio.h>
#include<string.h>

void main( )
{
    char a[10]="aBCDefgh",b[10]="ABcd",c[80]={'\0'};
    fun(a,b,c);

}
void fun(char *a,char *b,char *c)
{
    int k = 1;
    while(*a != *b)
    {
        if(*a < *b)
            c[k] = *b;
        else
            c[k] = *a;
        if(*a)
            a ++;
        if(*b)
            b ++;
        k++;
    }

}
```

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四、程序填空（10 分）。

(1) x 从键盘输入，计算$\cos(x) = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \ldots\ldots + (-1)^n \frac{x^{2n}}{(2n)!}$，并使最后一项的绝对值小于 0.000001 为止,最后输出 x 和计算结果。(*x* is input from the keyboard, $\cos(x) = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \ldots\ldots + (-1)^n \frac{x^{2n}}{(2n)!}$ is calculated, and the calculation stops when the absolute value of the last term is less than 0.000001. Finally, output x and the calculation result.)

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```
#include <stdio.h>
void main( )
{
   int i = 1;
   double x;
   _____;
   char s;
   printf("input x :\n");
   _____;
   s = 1;
   an = 1.0;
   bn = 1.0;
   while(an/bn>=1e-6)
   {
        _____;
        an = an * x * x;
        _____;
        s *= -1;
        i ++;
   }
   printf("cos(%f) = %f\n",_____);
}
```

(2) 输入一行字符串，统计其中数字和各个小写字母出现的次数。(Input a string and count the occurrences of numeric characters and each lowercase letter.)

```
#include<string.h>
#include<stdio.h>
void main( )
{
     char str[200];
     int i, num, s_alpha[26] ;

     gets(str);

     for(i=0;_____; i++)
     {
          if(_____)
               s_alpha[_____]++;
          else if(_____)
               num ++;
     }
     for(i=0; i<26; i++)
          printf("small letter %c : %d\n",  _____);
     printf("number : %d\n", num);
}
```

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五、输出程序运行结果(Read the program and write the result.)**（25 分）**

(1)

```
#include <stdio.h>
void main( )
{
    int i;
    for(i=2; i<10 ; i++)
    {
        if(i%4 == 0)
        {
            printf("to ");
        }
        else if(i%5 == 0)
        {
            break;
        }
        else
        {
            printf("Welcome ");
            continue;
        }
    }
    printf("HUST!");
}
```

(2)

```
#include <stdio.h>
int n;
void func( );
void main( )
{
    int i;
    for(i = 0; i <5; i++)
    {
        func(  );
    }
}
void func( )
{
    int m = 2;
    static int j = 1;
    m *= 2;
    j *= (n + 1);
    printf("n=%d, m=%d, j=%d\n",++n, m, j);
}
```

(3)

```
#include<stdio.h>
#define N 5
void main( )
{
    int a[N][N];
    int i,j;
    for(i=0;i<N; i++)
```

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```
    {
        a[i][0]=1;
        a[i][i]=1;
    }
    for (i=2;i<N;i++)
    {
        for (j=1;j<i;j++)
        {
            a[i][j]=a[i-1][j-1]+a[i-1][j];
        }
    }
    for(i=2;i<N;i++)
    {
        for(j=0;j<=i; j++)
        {
            printf("%5d",a[i][j]);
        }
        printf("\n");
    }
}
```

(4)

```
#include <stdio.h>
struct TEST
{
    char *str ;
    int num;
};
void main( )
{
    struct TEST a[ ] = {{"AIA", 987}, {"HUST", 654}, {"CHINA", 321},{"ASIA", 2025}} ;
    struct TEST *p ;
    int b=0, i=1;
    char *ss ;
    p = a + 3;
    ss = ++ (p->str) ;
    puts(ss);
    for(p=a; p< a + 4; p++)
    {
        b = b*10 + (p->num/i)%10;
        i *=10;
    }
    printf("b=%d\n", b) ;
}
```

(5)

```
#include<stdio.h>
void main( )
{
    char *str[ ] = {"HUST","WUHAN","HUBEI","_CHINA"};
    char **p[ ] = {str+3, str+2,str+1,str};
    char ***ppp = p;
    printf("%s---", *(*++ppp));
    printf("%s", *(*ppp+1)+1);
}
```

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六、编写程序（35 分）注意：不得使用全局变量，注意程序结构

(Programming. Note: Global variables must not be used. Pay attention to the program structure.)

(1) 编程实现从键盘输入一个数 x，计算输出结果 y。(8 分)

(Programming to input a number x from the keyboard and calculate and output the result y.)

$$y=\begin{cases} x+3 & x<1 \\ 2x-1 & 1\le x<10 \\ 3x+2 & 10\le x \end{cases}$$

(2) 编写三个函数分别完成指定整型一维数组元素的数据输入、求数组元素的平均值、求数组元素的最大值和最小值。由主函数完成这些函数的调用。（9 分）

(Write three functions to complete the data input of elements of a specified one-dimensional array of integer type, calculate the average value of the array elements, and find the maximum and minimum values of the array elements respectively. The main function is used to call these functions.)

(3) 编写函数实现在一字符串中指定位置插入一个子串，如在字符串“abfghi”中第二个字符的后面插入子串“cde”为“abcdefghi”，如插入位置不合法，原字符串不做任何处理。主函数完成字符串、插入位置、子串的输入，调用所编函数得到插入后的新字符串，在主函数中完成新字符串的输出。（9 分）

(Write a function to insert a substring at a specified position in a string. For example, insert the substring "cde" after the second character in the string "abfghi" to get "abcdefghi". If the insertion position is invalid, the original string will not be processed. The main function should complete the input of the string, insertion position, and substring, call the written function to obtain the new string after insertion, and output the new string in the main function.)

(4) 编程处理某班 10 个学生 5 门课的成绩，它们是高数、线性代数、英语、C 语言和体育。输入所有学生的姓名、性别和 5 门课的成绩，计算每个学生的平均分，统计平均成绩高于全班平均成绩的女生人数，并按学生平均分从高到低的顺序输出这些女生的成绩单。(9 分)

(Programming to process the grades of 10 students in a class for 5 courses, which are Advanced Mathematics, Linear Algebra, English, C Language, and Physical Education. Input the names, genders, and grades of all students for the 5 courses, calculate the average grade of each student, count the number of female students whose average grades are higher than the class average, and output the transcripts of these female students in descending order of their average grades.)

（编程题答题纸）(Programming Answer Sheet**)**