

Student Id. : (_____) , Name : (_____)

1. (15points) Fill out empty box with appropriate C code for implementing **my_strcpy** function that works like **strcpy()**.
 /* Function my_strcpy() copies C string pointed by src into the array pointed by des, including the terminating null character. Its return type is void. */

```
void my_strcpy(char* des, char* src)
{
```

```
    int i;
    for (i=0;src[i]!='\0';i++)
```

}

2. (15points) What is the screen output of following C code?

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

int main()
{
    char s[] = "Hello", t[6];
    char *q;
    strcpy(t,s);
    q = t;
    strcpy(t, "Bye");
    strcpy(s, "Good");
    s[0]='1';
    t[1]='3';
    q[2]='5';
    printf("string s = %s\n", s);
    printf("string t = %s\n", t);
    printf("string q = %s\n", q);
    return 0;
}
```

Screen output (Write your answer here)

3. (15points) A parlindrome is a word or a sequence of words that has the property of reading the same in either direction. Examples of the parlindrome are "level", "radar", "hannah", and etc. Fill out empty box in following program that checks whether a given string is parlindrome or not. The program should get a string (length < 1000) from a keyboard, then print whether the input string is parlindrome or not. If it is a parlindrome, print "parlindrome". If not, print "NOT parlindrome". (You may use standard library functions in your implementation.)

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

int isParlindrome(char* s);

int main()
{
    char str[1000];
    gets(str);
    if (isParlindrome(str))
        printf("parlindrome\n");
    else printf("NOT parlindrome\n");

    return 0;
}
```

```
int isParlindrome(char* s)
// returns 1 if s is parlindrome, and
// returns 0 if s is not parlindrome
{
```

Screen input/output Example

```
level          <--- input
parlindrome    <--- output
alice          <--- input
NOT parlindrome <--- output
```

4. (10points) Suppose **x** is an array of (**int** type) integers, and we have just executed this code:

```
for(i=0;i<5;i++) x[i] = i+5;
```

Suppose that **x[0]** is stored at address 2000. What is the value of each of the following expressions?

- (1) **x** : ()
- (2) ***x** : ()
- (3) **&x[3]** : ()
- (4) **x+2** : ()
- (5) ***(x+1)** : ()

5. (15points) Fill out empty boxes with appropriate C code. The code implements and calls swap function that switches the values of two argument variables as shown in screen output example.

<pre>#include <stdio.h> void swap(<input style="border: 1px solid black; display: inline-block; margin-right: 5px;" type="text" value=""/>, <input style="border: 1px solid black; display: inline-block; margin-right: 5px;" type="text" value=""/>) { <div style="border: 1px solid black; height: 100px; width: 100%; margin-top: 10px;"></div> } </pre>	<pre>void main() { int x=3, y=2; printf("before: x=%d, y=%d\n",x,y); swap(<input style="border: 1px solid black; display: inline-block; margin-right: 5px;" type="text" value=""/>, <input style="border: 1px solid black; display: inline-block; margin-right: 5px;" type="text" value=""/>); printf("after : x=%d, y=%d\n",x,y); } </pre> <hr style="border-top: 1px dashed black;"/> <p><u>Screen output Example</u> before: x=3, y=2 after : x=2, y=3</p>
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6. (10points) Consider following C function.

```
double a(unsigned int y, double x)
{
    if (y==0) return 1;
    return x*a(y-1,x);
}
```

What is the return value of **a(3,7.0)**? (Answer : _____)

7. (10points) Write a one-line C code that generates a random real number (float type) **x** that is between *a* and *b* using **rand()** function. *a* and *b* are real numbers (float type). Assume **int rand()** function generates a random integer value between 0 and **RAND_MAX**.

x = (_____); // generate a random real number $x \in [a,b]$

8. (10 points) Write the screen output after executing the following program.

<pre>int func (int a, int b) { a *= 2; printf("a = %d, b = %d.\n", a, b); return (--a) * (b--); } int sub (int *a, int *b) { *b /= 6; printf("a = %d, b = %d.\n", *a, *b); return (--*a) * ((*b)-1); } </pre>	<pre>int main() { int x = 6, y = 8, z=3; z = func(--x, y++); printf("x = %d, y = %d, z = %d.\n", x, y, z); z = sub(&x, &y); printf("x = %d, y = %d, z = %d.\n", x, y, z); return 0; } </pre> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p>screen output (write your answer here)</p> <div style="border: 1px solid black; height: 100px; width: 100%;"></div> </div>
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