.......Student Name:.................. .... NID:..........................

COP 3223 Sec 3: Spr'23 C Programming Prac Test 3 (50 points)

1. (8 points)
   NOT ON TEST THREE: Write the output for the following program. Assume input is aBcD!0
   Use this scale below if it is useful to you.

```
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
A B C D E F G H I J K  L  M  N  O  P  Q  R  S  T  U  V  W  X  Y  Z
```

```
                                  ___WRITE YOUR OUTPUT HERE_
                                 ---------------------------
                                 |
                      Out Line 1 |
                                 |
                                 |
                      Out Line 2 |
```

```
#include <stdio.h>
#include <ctype.h>
int main() {
  char c;
  while ((c = getchar()) != '0') {
    if (isupper(c))
       putchar(('A' + 15-(c-'A')));
    else if (islower(c))
       putchar(('a' + 5 +(c-'a')) );
    else
       putchar(c);
  }
  return 0;
}
```

2. (6 points) NOT ON TEST THREE: Write down what the printed output of this program is:

```
#include <stdio.h>
int main(){
  return 0;
}
```

3. (3 points) Write down what the printed output of this program is:

```
#include <stdio.h>
int main(){
int i;
int *i_ptr;
i_ptr = &i;
i = 10;
(*i_ptr) = 24;
if(i == 10) {
  printf("i1=%d\n", i);
}
if(i == 24) {
  printf("i2=%d\n", *i_ptr);
}
return 0;
}
```

4. (6 points) Write down what the printed output of this program is:

```
#include <string.h>
#include <stdio.h>
int main(){
char my_array[15];
char *my_array_ptr;
strcpy(my_array, "niels");
my_array_ptr = my_array;
my_array_ptr += 5;
*my_array_ptr = 'l';
my_array_ptr++;
*my_array_ptr = 'o';
my_array_ptr++;
*my_array_ptr = '\0';
my_array_ptr = my_array;
printf("string=%s\n",my_array_ptr);
return 0;
}
```

```
Answers q1:
fOhM!
Answers q4:
nielslo
```

5. (15 points) Write down what the printed output of this program is:

```
#include <stdio.h>
int f1(int *a, int b);
int f2(int a, int *b);
int main(void) {
  int a=5, b=2, c=7, d=9;
  c = f1(&d, a);
  printf("a=%d b=%d c=%d d=%d\n",a,b,c,d);
  a = f2(c-d, &a);
  printf("a=%d b=%d c=%d d=%d\n",a,b,c,d);
  b = f1(&c, 8);
  printf("a=%d b=%d c=%d d=%d\n",a,b,c,d);
  d = f2(b, &a);
  printf("a=%d b=%d c=%d d=%d\n",a,b,c,d);
  return 0;
}
int f1(int *a, int b) {
  *a = b -8;
  b = b*2 - (*a);
  printf("In f1: a=%d b=%d\n", *a, b);
  return b - *a;
}
int f2(int a, int *b) {
  a = *b+a;
  *b = 37 - *b;
  printf("In f2: a=%d b=%d\n", a, *b);
  return a;
}
```

6. (10 points)
Write down what the printed output of this program is:

```
                                        ___WRITE YOUR OUTPUT HERE_
                                       |
                         Out Line 1    |
                                       |
                                       |
                         Out Line 2    |
```

```
#include <stdio.h>
int f(int c, int b, int a);

int main() {

  int a = 2, b = 3, c=5;
  printf("a=%d b=%d c=%d\n", a, b, c);

  a = f(b, a, b+c);
  printf("a=%d b=%d c=%d\n", a, b, c);

  return 0;
}

int f(int c, int b, int a) {

  int sum;
  sum = a + b + c;
  if (sum > a*c)
    return a*c;
  if (sum <= b*c)
    return b*c;

  return a*b;
 }
```

7. (12 points) Write down what the printed output of this program is:

```
#include <stdio.h>
int f1(int *a, int c);
int main(void) {
  int a=2, b=3, c=4, d=5;
  a = f1(&c, b);
  printf("a= %d b= %d c= %d d= %d\n",a,b,c,d);
  return 0;
}
int f1(int *a, int c) {
  *a = c - 2;
  c = c*2 - (*a);
  printf("a= %d c= %d\n", *a, c);
  return c - *a;
}
```

THIS OUTPUT WILL BE GRADED

Out Line 1 |

Out Line 2 |

Out Line 3 |

8. (14 points) Write down what the printed output of this program is:

```
#include <stdio.h>
int f1(int *a, int c);
int main(void) {
  int a=2, b=3, c=4, d=5;
  a = f1(&c, f1(&b,d));
  printf("a= %d b= %d c= %d d= %d\n",a,b,c,d);
  return 0;
}
int f1(int *a, int c) {
  *a = c - 2;
  c = c*2 - (*a);
  printf("a= %d c= %d\n", *a, c);
  return c - *a;
}
```

THIS OUTPUT WILL BE GRADED

Out Line 1

Out Line 2

Out Line 3

9. (11 points)
Write down what the printed output of this program is:

ONLY THIS OUTPUT WILL BE GRADED

Out Line 1

Out Line 2

Out Line 3

```
1.      #include <stdio.h>
2.      int f(int c, int b, int a);

3.      int main() {

4.           int a = 1, b = 2, c=2;

5.           a = f(b,  f(a, c, b+c), a+c);

6.           printf("a=%d b=%d c=%d\n", a, b, c);

7.           return 0;
8.      }

9.      int f(int c, int b, int a) {

10.       int sum;
11.       b = a + c;
12.       sum = a + b + c;
13.       printf("a=%d b=%d c=%d\n", a, b, c);
14.       if (sum > a*c)
15.         return a*c;
16.       if (sum <= b*c)
17.         return b*c;
18.       return a*b;
19.      }
```

10. (15 points)
Write down what the printed output of this program is:

```
#include <stdio.h>
int f(int *a, int c, int b);
int main(void) {
  int a=1, b=3, c=2;
  a =   f(&c, f(&b,a,c),a);
  printf("a= %d b= %d c= %d\n",a,b,c);
  return 0;
}

int f(int *a, int c, int b) {
  *a = *a - 1;
  c = c*2 + (*a);
  b = b - 1;
  printf("a= %d, b= %d, c= %d\n", *a, b, c);
  return c - *a + 1;
}
```

ONLY THIS OUTPUT WILL BE GRADED

Out Line 1 |

Out Line 2 |

Out Line 3 |

11. (14 points) NOT ON TEST THREE: Write down what the printed output of this program is:

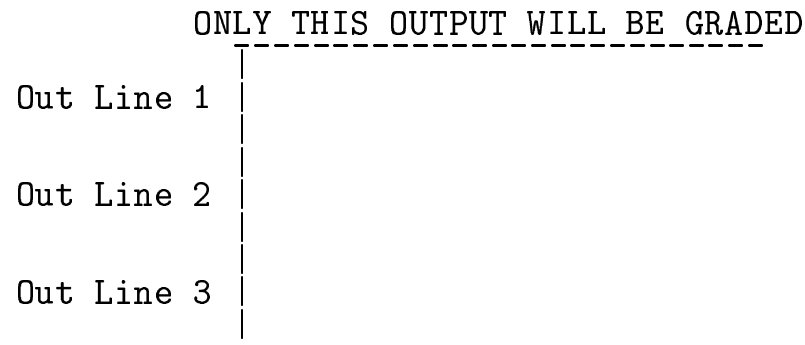
```
#include <stdio.h>
#include <ctype.h>
int main() {
  char first[30], last[30];
  char wholename[60];
  scanf("%s", first);
  scanf("%s", last);
  if (strcmp(first, last) < 0)
    printf("Your first name comes first alphabetically.\n");
  else if (strcmp(first, last) == 0)
    printf("You're weird.\n");
  else
    printf("Your last name comes first alphabetically.\n");
  printf("first = %s, last = %s\n", first, last);
  strcat(first, last);
  printf("first = %s, last = %s\n", first, last);
  strcpy(wholename, first);
  printf("first = %s, wholename = %s\n", first, wholename);
  printf("Your whole name is %d characters.\n", strlen(wholename));
  return 0;
}
```

THIS OUTPUT WILL BE GRADED

```
Out Line 1 |
           |
Out Line 2 |
           |
Out Line 3 |
           |
Out Line 4 |
           |
Out Line 5 |
```

Student Name (ALL CAPS):..... P/NID:.....

12. (12 points)
Write down what the printed output of this program is:




```
1.      #include <stdio.h>
2.      int f(int a, int d, int b, int c);

3.      int main() {

4.           int a = 1, b = 3, c=2, d=4;

5.           a = f(d, a, f(a, c, b+c, d), a+c);

6.           printf("a=%d b=%d c=%d d=%d\n", a, b, c, d);

7.           return 0;
8.      }


9.      int f(int a, int d, int b, int c) {

10.       int sum;
11.       b = a + c;
12.       sum = b - c;
13.       d = sum + d;
14.       printf("a=%d b=%d c=%d d=%d\n", a, b, c, d);
15.       if (sum > a*c)
16.         return a*c;
17.       if (sum <= b*c)
18.         return  sum+a;
19.       return a*b;
20.      }
```

Student Name (ALL CAPS):..... P/NID:.....

13. (16 points)
Write down what the printed output of this program is:

```
#include <stdio.h>
int f(int *d, int c, int b, int *a);
int main(void) {
  int a=1, b=3, c=2, d=4, e=5;
  e =   f(&a, f(&b,a,e,&c),e,&d);
  printf("a= %d b= %d c= %d d= %d e= %d\n",a,b,c,d,e);
  return 0;
}

int f(int *d, int c, int b, int *a) {
  *a = *a + 1;
  c = c + (*a);
  b = b + c;
  *d = *a + 2;
  printf("a= %d, b= %d, c= %d d=%d\n", *a, b, c, *d);
  return *d - *a + 2;
}
```

ONLY THIS OUTPUT WILL BE GRADED

Out Line 1 |

Out Line 2 |

Out Line 3 |