

COP 3223 Section 4 Exam #2
Form A – Multiple Choice
Fall 2014
11/1/2014

Lecturer: Arup Guha

Directions: Answer all multiple choice questions on the scantron. Each question has a single correct answer. In case of ambiguities, choose the most accurate answer. Each of these questions is worth 3 points for a correct answer. Incorrect answers and questions left blank are worth 0 points. Hand in **ONLY** the scantron, keep the test questions, and take the free response section of the exam.

The first three questions concern the output of the following C program:

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

int main() {
    int a = 2, b = 7;
    b = f(b+a, b-a);
    printf("a = %d\n", a);
    printf("b = %d\n", b);
    return 0;
}

int f(int a, int b) {
    a += 3;
    b = 2*a - b + 5;
    printf("a = %d, b = %d\n", a , b);
    return a+b;
}
```

1) What is the output of the first line of the program?

A) a = 3, b = 11 B) a = 10, b = 23 C) a = 12, b = 24

D) a = 7, b = 17 E) None of the Above

2) What is the output of the second line of the program?

A) a = 2 B) a = 3 C) a = 7 D) a = 12

E) None of the Above

3) What is the output of the third line of the program?

A) b = 7 B) b = 23 C) b = 24 D) b = 36

E) None of the Above

4) Assume that x is an integer variable. Which of the following represents the memory address where x is stored?

A) x B) &x C) *x D) 2*x E) None of the Above

5) Which of the following opens the file "a.txt" to write to?

A) FILE* ifp=open("a.txt"); B) FILE* ifp=fopen("a.txt")
C) FILE* ifp=open("a.txt","w"); D) FILE* ifp=fopen("a.txt","r");
E) None of the Above

Questions 6 - 8 concern the output of the following C program:

```
#include <stdio.h>
int g(int *a, int *b);

int main() {
    int a = 2, b = 7;
    b = g(&b, &a);
    printf("a = %d\n", a);
    printf("b = %d\n", b);
    return 0;
}

int g(int *a, int *b) {
    (*a) = (*a) + 3;
    (*b) = 2*(*a) - (*b) + 5;
    printf("a = %d, b = %d\n", *a , *b);
    return (*a)+(*b);
}
```

6) What is the output of the first line of the program?

- A) a = 3, b = 11 B) a = 10, b = 23 C) a = 12, b = 24
D) a = 7, b = 17 E) None of the Above

7) What is the output of the second line of the program?

- A) a = 2 B) a = 3 C) a = 7 D) a = 12
E) None of the Above

8) What is the output of the third line of the program?

- A) b = 7 B) b = 23 C) b = 33 D) b = 36
E) None of the Above

9) Which of the following is potentially a valid formal parameter to some function?

- A) 3 B) 17 C) x D) x + y E) None of the Above

10) Which of the following is true of arrays in C?

- A) Their names must start with a letter.
B) They can have no more than 10000 slots.
C) They must store integers or characters.
D) They are defined using a for loop.
E) None of the Above

Questions 11 - 14 concern the output of the following C program:

```
#include <stdio.h>
void mixarray(int array[], int length);

int main() {
    int vals[] = {3, 8, 2, 7};
    mixarray(vals, 4);
    int i;
    for (i=0; i<4; i++)
        printf("vals[%d] = %d\n", i, vals[i]);
    return 0;
}

void mixarray(int array[], int length) {
    int i;
    for (i=1; i<length; i++)
        array[i] += array[i-1];
}
```

- 11) What is the output of the first line of the program?
- A) vals[0] = 0 B) vals[0] = 3 C) vals[0] = 8 D) vals[0] = 11
E) None of the Above
- 12) What is the output of the second line of the program?
- A) vals[1] = 8 B) vals[1] = 11 C) vals[1] = 13 D) vals[1] = 20
E) None of the Above
- 13) What is the output of the third line of the program?
- A) vals[2] = 2 B) vals[2] = 10 C) vals[2] = 13 D) vals[2] = 20
E) None of the Above
- 14) What is the output of the fourth line of the program?
- A) vals[3] = 7 B) vals[3] = 9 C) vals[3] = 13 D) vals[3] = 20
E) None of the Above
- 15) Who wrote the Autobiography of Malcolm X?
- A) Malcolm X B) Martin Luther King Jr. C) Ken Burns
D) Malcolm Gladwell E) Steven King

Fall 2014 COP 3223 Section 4

Exam 2 Free Response Answer Sheet

Last Name: _____, First Name: _____

1) (12 pts) Write a function that calculates and returns the n^{th} Triangle Number, where n is the input parameter. You may assume that n is guaranteed to be positive. Note that n^{th} Triangle Number is the sum of the first n positive integers. For example, the 5^{th} Triangle Number is 15, since $1 + 2 + 3 + 4 + 5 = 15$. (Note: You will get **no** credit on this question if you put a `printf` in this function.) Please fill out the function definition provided below:

```
int triangle(int n) {
```

```
}
```

2) (16 pts) The file “numbers.txt” has exactly 10000 non-negative integers in it, one per line. Complete the program below so that it opens the file, reads in all the integers, determines how many of those integers end in each digit, prints this information out, and closes the file. (See the document camera projection for a sample for clarification.)

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

```
int main() {
```

```
    return 0;
```

```
}
```

3) (10 pts) Write a function that takes in pointers to two integers and modifies the integers by storing the sum of the original integers in the first integer variable and the difference of the two integers in the second variable. For example, if ptrX points to a variable storing 7 and ptrY points to a variable storing 3 before the function is called, after the function completes, ptrX should point to the same location but that location should store 10 and ptrY should point to the same location but this location should store 4.

```
void sumdiffchange(int *ptrX, int *ptrY) {
```

```
}
```

4) (5 pts) Write a function that takes in an integer, representing a social security number and adds a random number in between 1 and 10, inclusive, to it and returns that value as the next social security number to assign. Assume the random number generator has been seeded and all necessary includes have been made.

```
int nextSSN(int curSSN) {
```

```
}
```

5) (12 pts) Write a function that takes in the current social security number and prints out the next n social security numbers assigned, by calling the nextSSN function n times. Print out one number per line on n lines and nothing else.

```
void printSSNs(int curSSN, int n) {
```

```
}
```