COP 3223 Section 4 Exam #2
Form A – Multiple Choice
Spring 2015
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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.

1) Which of the following keywords can be used to define a constant in C?

A) constant   B) #define   C) PI
              D) int   E) None of the Above

2) What is the output of the following segment of code?

```
int x = 3, y = 13;
if (y/x > x%y)
    printf("A");
else
    printf("B");
if (y == (y/x)*x)
    printf("C");
printf("D");
```

A) ACD   B) BCD   C) AD   D) BD   E) None of the Above

3) What is the output of the following segment of code?

```
int i, j, total = 0;
for (i=3; i<7; i++)
    for (j=2; j<6; j++)
        total++;
printf("%d", total);
```

A) 10   B) 16   C) 20   D) 25   E) None of the Above

4) What is the output of the following segment of code? (Note that there appears to be an error. Keep in mind that this segment of code does compile and your task is to determine what will get printed when this segment is executed, as written.)

```
int x = 2, y = 5;
if (x = 3*y)
    printf("%d ", x);
if (y < x)
    printf("%d", x/y);
```

A)   B) 2 0   C) 15 0   D) 15 3   E) None of the Above

5) What is the output of the following segment of code? (Note that there appears to be an error. Keep in mind that this segment of code does compile and your task is to determine what will get printed when this segment is executed, as written.)

```
int i, total = 0;
for (i=2; i<9; i++);
    total += i;
printf("%d", total);
```

A) 8   B) 35   C) 36   D) 44   E) None of the Above

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

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

int main() {
    int a = 3, 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 += 2;
    b = 3*a - 2*b + 4;
    printf("a = %d, b = %d\n", a , b);
    return a+b;
}
```

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

A) a = 5, b = 5   B) a = 6, b = 2   C) a = 12, b = 26
        D) a = 12, b = 32   E) None of the Above

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

A) a = 2   B) a = 5   C) a = 6   D) a = 12
        E) None of the Above

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

A) b = 8   B) b = 10   C) b = 32   D) b = 44
        E) None of the Above

Questions 9 - 11 concern the output of the following C program:

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

int main() {
    int a = 3, 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) += 2;
    (*b) = 3*(*a) - 2*(*b) + 4;
    printf("a = %d, b = %d\n", *a , *b);
    return (*a)+(*b);
}
```

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

A) a = 25, b = 9   B) a = 9, b = 25   C) a = 5, b = 5
          D) a = 7, b = 19   E) None of the Above

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

A) a = 5   B) a = 7   C) a = 9   D) a = 25
          E) None of the Above

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

A) b = 34   B) b = 25   C) b = 10   D) b = 9
          E) None of the Above

Questions 12 - 14 concern the output of the following C program:

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

int main() {
    int vals[] = {2, 7, 6, 5, 8, 1};
    mixarray(vals, 6);
    int i;
    for (i=0; i<6; i+=2)
        printf("%d %d\n", vals[i], vals[i+1]);
    return 0;
}

void mixarray(int array[], int length) {
    int i, tmp = array[0];
    for (i=0; i<length-1; i++)
        array[i] = array[i+1];
    array[length-1] = tmp;
}
```

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

A) 2 7   B) 7 6   C) 6 7   D) 7 2   E) None of the Above

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

A) 6 5   B) 5 6   C) 8 5   D) 8 1   E) None of the Above

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

A) 8 1   B) 1 8   C) 1 2   D) 2 1   E) None of the Above

15) The Daily Show announced its new host. Roughly speaking, how often is there a new episode of the Daily Show?

A) daily   B) weekly   C) semi-annually
          D) annually   E) once a century

1) (10 pts) Tanya likes saving paper by printing her course notes with four pages to a single side of a page, printing double sided pages. As a result, she is able to fit 8 pages worth of course notes onto one sheet of paper. Complete the program below so that it asks the user how many pages of course notes there are to print and then outputs the number of sheets of paper Tanya will need to print out those notes. You may assume that the user enters a positive integer.

```c
#include <stdio.h>

int main() {




    return 0;
}
```

2) (10 pts) Define tricky integers to be those that are not divisible by 2, 3 or 5. Complete the program below so that it prints out the number of tricky integers in between 1 and *n*, inclusive, where *n* is entered by the user.

```c
#include <stdio.h>

int main() {

    int n, i, count = 0;
    printf("Please enter n.\n");
    scanf("%d", &n);




    printf("There are %d tricky integers from 1 to %d.\n", count, n);
    return 0;
}
```

3) (10 pts) Complete the function below so that it counts the number of items in *array* that are in between *low* and *high*, inclusive. *length* represents the length of *array*.

```
int cntInRange(int array[], int low, int high, int length) {
```

```
}
```

4) (10 pts) Complete the function below so that it returns $base^{exp}$ where *base* and *exp* are the two formal parameters shown, both guaranteed to be positive. You may also assume that the return value fits in an integer variable. (For example, `power(2, 5)` should return 32.)

```
int power(int base, int exp) {
```

```
}
```

5) (15 pts) An input file, "baseball.txt", stores data about every player in a baseball league. The file format is as follows: the first line stores a single positive integer, n, representing the number of players in the league. The data for each player follows, with one line per player. In each of these lines, there are three space separated integers: the team number of the player (0 to 19, inclusive), the number of hits for that player, and the number of at bats for that player. Here is the beginning of a sample file:

```
300
0 10 35
19 121 300
19 85 316
```

The first player plays for team 0 and made 10 hits out of 35 at bats. The second player plays for team 19 and had 121 hits out of 300 at bats. The third player is also on team 19 and had 85 hits out of 316 at bats. The batting average of a team is defined as the total number of hits by the team divided by the total number of at bats by the team. Complete the program below so that it opens the file "baseball.txt", calculates the batting average of each of the 20 teams, and prints out the team number and batting average of each team, in order by team number, and closes the file. You may assume each team has had in between 1 and 1000 at bats and for each player has a non-negative number of hits less than or equal to his/her number of at bats.

```c
#include <stdio.h>
#define NUMTEAMS 20

int main() {
    int i, n, hits[NUMTEAMS], atbats[NUMTEAMS];
    for (i=0; i<NUMTEAMS; i++) {
        hits[i] = 0;
        atbats[i] = 0;
    }
    FILE* ifp = _____;
```

```c
    return 0;
}
```