Exam 2 **CSC 126**

1) Given the following code:

```
1  #include<iostream>
2  using namespace std;
3  void addFunds(double &, char &, int, int);
4  int main()
5  {
6     double donation = 50.00;
7     char receipt = 'R';
8     int code = 1;
9
10    cout << "Thank you for your donation of " << endl;
11    cout << '$' << donation << ' ' << receipt << ' ' << code << endl;
12    addFunds(donation, receipt, code, 20);
13    cout << '$' << donation << ' ' << receipt << ' ' << code << endl;
14    cout << "\tHappy Holidays!\n";
15    system("PAUSE");
16    return 0;
17 }
18 void addFunds(double& d, char& ch, int x, int a)
19 {
20
21    if (x < 14)
22    {
23          x++;
24          d += 2*a;
25          ch = 'b';
26    }
27    else
28    {
29          x = a;
30          ch = '#';
31    }
32    cout << d << ' ' << ch << ' ' << x << endl;
33
34 }
```

a) (10 points) What is printed to standard output?

b) (2 points) Which formal parameters are reference parameters?

c) (2 points) Which line contains a function call?

d) (2 points) Which line contains a function prototype?

2) Write the prototype, sample call, and definition (header and body) of a function largeSum. This function takes three integer parameters, and returns either a -1, 0 or 1. It returns a -1 if the **product of all three** parameters is **negative**. It returns a 0 if the **product of all three parameters** is 0. It returns a 1 if the **product of all three** parameters is **positive**. For example, if the three parameters are -10, 2 and 0, this function will return a -1 because -10 + 2 + 0 is -8 which is negative.
   a) (2 points) Prototype
   b) (2 points) Sample call (declare any variables, if needed.)
   c) (10 points) Function definition:

3) (36 points) Given the following declarations (assume that all variable have values, although we do not know what they are!)

```
int a, b, c;
double x, y, z;
char letter;
int numbers[12];
char wordVal[30];
```

   a) Write the C++ statement that will print out only the **highest** value of the three numbers: a, b and c.
   b) Write the C++ statement that will assign x the value of $\sqrt{(y+2)^z}$
   c) Write the C++ statements that will print out all even numbers between 1 and 3*b (you may assume for this that b is a positive number that is > 1).
   d) Write the C++ statements that will print out **how many** of the elements in numbers are **divisible by 10 and divisible by 3**.

   e) Write the C++ statement that continuously (in a loop) prompts the user for the character (cin >> letter). If the character is an lower case alphabetic character (between A and Z inclusive), the code prints it twice, otherwise the code prints it three times. The loop ends when the user types in a '!'.

4) (10 points) What is printed by the following code?

```
    int hoursStudied[7];
    string days[7] = { "Mon", "Tues", "Wed", "Thurs", "Fri", "Sat",
"Sun" };
```

```
int i;

for (i = 0; i < 7; i++)
{
      hoursStudied[i] = 3;

      if (i == 0 || i == 5)

      hoursStudied[i] += 3;
}

for (i = 0; i < 7; i++)

      cout << days[i] << ":    " << hoursStudied[i] << endl;
```

5) (6 points) Given the following code, make a grid and show the contents of gameBoard after the code executes.

```
double stars[2][3];
int i;
int j;
for (i = 0; i < 2; i++)
      for (j = 0; j < 3; j++)
            stars[i][j] = i - (j * 3);
```

6) (18 points) Write a full program, including comments!

Suppose you have a file `gifts.txt` that has many lines with possible Amazon gift names, gift price, and star rating. (HERE ARE ONLY THE FIRST 4 LINES, THERE ARE MANY MORE IN THE FILE! The first line means that the Echo Dot costs $)

```
EchoDot 22.00  4.6
EchoShow  49.99 4.4
Fire7    29.99   3.9
KindlePaperwhite 110.00   4.3
.
.
.
```

The first line means that a EchoDot costs $22.00 and has 4.6 stars.

WE DO NOT KNOW HOW MANY LINES THERE ARE IN THE FILE.

Write the C++ code that (reads each line from the file and) prints out the names of all the fruits, the price, and the servings. It also prints a **Y** if we will buy the gift, and an **N** if we will not buy the gift, and a **M** if we are not sure (maybe) if we will buy the gift. Our program has a function that will return **Y** or **M** or **N**, depending on the price and stars. If the price is less than 30 and stars are more than 4 we will buy the gift. If the price is less than 30 and the stars are between 3 and 4 we might buy the gift. Otherwise we won't buy the gift.
The program will print how many gifts we will buy, and how many we might (maybe) will buy.

So if the file was just the four lines above (OF COURSE IT HAS MORE), the output would be:

```
Name        Price       Stars   Buy
EchoDot     22.00       4.6     Y
EchoShow    49.99       4.4     N
Fire7       29.99       3.9     M
Kindle      110.00      4.3     N

Number of gifts we will buy: 1
Number of gifts we will maybe buy: 1
```