Name (last, First) _____   _____

Instructor_____

Question #	Total Possible	Total Received
1.	8	
2.	8	
3.	8	
4.	14	
5.	18	
6.	10	
7.	16	
8.	18	
TOTAL	100	

1) (8 points) Suppose that we have the following declarations:

```
double alpha, x = 5, y = 2;
bool flag;
```

What is the value assigned to alpha or flag with each of the following expressions?

```
        a) alpha = 3.5 + 10 % 6 / 8;
```

```
        b) flag = (15  * y == 9 || 4 < 8);
```

2)   a) (4 points) Declare an array to store the hospital bill amounts for 300 patients.

         b) (4 points) Assign each element of the array a value of 40.00.

3. (8 points) Match the term in **COLUMN A** with the phrase in **COLUMN B** which defines the term. Write the letter of the phrase in the blank space to the left of the term. Note that as there are more phrases than terms, not every phrase matches a term,

<u>**COLUMN A**</u>

<u>COLUMN B</u>

1. ____ bit

2. ____ syntax

3. ____ CPU

4. ____ ASCII code

5. ____ compiler

6. ____ hard-drive

7. ____Random Access Memory

8. ____ algorithm

a. The binary representation of characters stored on a computer

b. The set of rules for formulating grammatically correct language statements.

c. Volatile memory where your programs and data are stored while you use the computer.

d. Secondary storage for data.

e. A program which translates instructions written in a high-level language into the equivalent machine language

f. Hardware which performs control functions and arithmetic and logical operations

g. A step by step problem solving process in which a solution is arrived in a finite amount of time.

h.   Part of the development environment that allows users to step through code line by line, and view data values.

i. Smallest unit of logic equivalent to a 1 or 0

4.

```
1    #include <iostream>
2    using namespace std;
3
4    void takeTrip(double m, double & t);

5    int main()
6    {
7         double  marker = 46.5;
8         double  traveled = 0;

9         cout << "Beginning at mile marker: " << marker
                 << endl;

10        takeTrip(marker,traveled);
11
12        cout << "Mile marker is: " << marker << endl;
13        cout << "Traveled: " << traveled << endl;
14
15        takeTrip(marker,traveled);

16        cout << "Mile marker is: " << marker << endl;
17        cout << "Traveled: " << traveled << endl;

18        return 0;
19   }

20   void takeTrip(double  m, double & t)
21   {
22        m = m + 10;
23        t = t + m;
24   }
```

a)   (8 points) What is printed by the program above?

b) (2 points) Which line(s) contain function calls?_____

c)   (2 points) Which line(s) contain function prototype(s)?_____

d) (2 points) List all reference parameters._____

5. What is printed by the following code? If the loop is infinite, write INFINITE LOOP.

    a) (8 points)

```
double cells[4];

for (i = 0; i < 4; i++)
     cells[i] =i * i;

for (i = 0; i < 4; i++)
     cout << cells[i] << '\t';

cout << endl;

for (i = 0; i < 2; i++)
     cells[i * 2] = 5;

for (i = 0; i < 4; i++)
     cout << cells[i] << '\t';
```

    b) (6 points)

```
int i, j;
for (i = 0; i <=4; i+=2)
{
     cout << i;
     for (j = 0; j <= i; j++)
     {
          cout << '#';
     }
     cout << j << endl;
}
```

c) (4 points)
```
int num = 50;
while (num < 52)
      cout << "Hi" << endl;
cout << "Bye" << endl;
```

6) (10 points) Write the definition (header and body) for a value returning function called `hasPair`.

- This function accepts three `double` parameters and checks to see if **ANY** two of the parameters are equal.

- If any two parameters are equal, the function returns `true`; otherwise the function returns `false`.

7)   Questions a-d are 3 points each, question e is 4 points.

Suppose you have strings:

```
char wordA[ ] = {"HAPPY"};

char wordB[ ] = {"HOLIDAYS"};

char wordC[20];
```

Suppose you have integer variables:

```
int n1, n2;
```

---

a. What is the value of **wordB[1]**? _____

b. **n1 = strlen (wordA);** What value does **n1** receive? _____

c. **n2 = strcmp (wordB, wordA);**
              What is the value of **n2**? _____

d. After **strcpy (wordC, wordB)** what is in w**ordC**? _____

e. (4 points) Suppose there was a **wordD** declared similar to **wordA** or
    wordB above.   Further assume that the initial value stored is not known
    to you.   Write the code fragment that finds the number of occurrences of
    the letter 'A' in **wordD**. DO NOT WRITE AN ENTIRE PROGRAM.

    EXAMPLE: If **wordD** stored the word **ABRACADABRA**, your code would
    display the following output:

    ```
    There are 5 A's in ABRACADABRA.
    ```

8) (18 points)

On the next page, write a complete C++ program that accomplishes the task indicated
below. Use good form by including comments and meaningful identifiers. Be accurate
with the syntax -- as if you were typing the program on the computer.

Assume that there is a file on disk named HOUSESEATS.TXT that contains information
about the past election **for all new representatives in Congress**. Each line contains the
state name, a number that indicates the district in the state, and the percentage of the vote
that the winning candidate has. The first few lines in the file are shown:

```
Alabama    2     61.1
Arizona    1     50.1
Arizona    5     62.3
Arkansas   1     61.8
```
.
**The first line means that in Alabama, district #2 the new winning representative
received 61.1% of the vote.**
**Write the program on the assumption that you do not know how many lines are in
the list. You may assume that there are no spaces in the state names.**

Write a C++ program that will do the following:

   <i> Open the file and read in the data.

   <ii> Call a value returning function that returns 'y' if the representative received
   more than 60% of the vote and 'n' otherwise.

   <iii> Compute the total number of delegates winning more than 60% of the vote.

   <iv> Compute the average number percentage win.

   <iv> Print the output so that it is organized as below. (Of course there will be more
   lines, because this is shown only for the lines above, and we **<u>don't</u>** know HOW many
   lines are in the file). <u>All printing is done in the</u> `main` <u>function</u>.

```
STATE      District  Percentage Win      >60%
---------------------------------------------
Alabama    2         61.1                y
Arizona    1         50.1                n
Arizona    5         62.3                y
Arkansas   1         61.8                y

Total number who won more than 60% of the vote was: 3

Average Percentage Won: 53.8
```
9

Write Your Program Here

Scrap

Scrap