COSC 1560 – Computer Programming II

Mid-Term Examination #1 (Sample)

NAME:

Attempt all questions. The number of points for each question is shown. The total is 100 points.

[16 points]

1) Identify syntax errors in the following code, and show how they should be corrected. *Write the corrected code as a comment on the same line.*

```
#include “iostream.h”                          //
using namespace std                            //

void add(int numbers[]; double size)           //

int main()                                     //
{
        int n = 0;                             //
        double[] values = {1.2,  5.5, 6.6};    //

        int result;                            //

        result = add(values[], 3);             //

        cout << Total:   << “result” << endl;  //

        return 0;                              //
}

void add(double numbers[]; int size);          //
{
        int total;                             //
        for (int i=0; i <= size; --i)
        {
                total =+ numbers[i];           //
        }
        return total;                          //
}
```

[8 points]

2) Describe the meaning of passing arguments to a function “by value” and “by reference”. Give a simple example of each type of argument.

[8 points]

3) Suppose the following variables are declared as follows:

```
int num;
int i = 8;
```

Explain the difference between the following two statements:

```
num = ++i + 10;

num = i++ + 10;
```

[12 points]

4) A file named “Data.txt” contains the following six numbers:

10 12 11 9 8 10

Write code to open the file for reading, determine and display the largest number, and close the file.

[8 points]

5) The following array is to be sorted into ascending order using the ‘selection sort’ algorithm:

5	8	1	9	7

The first loop of the algorithm identifies the smallest value in the array. As a result of this first loop, show how the values will be moved in the array:

[15 points]

6) A function named “tester” takes an array of ‘int’ as the first argument, the number of elements in the array as the second argument, and a value of type ‘int’ as the third argument. The function should return the number of elements in the array that are larger than the value passed as the third argument. Write the function.

[15 points]

7) The following array contains values that are sorted in ascending order:

1	3	5	6	8	9	11
0	**1**	**2**	**3**	**4**	**5**	**6**

The 'binary search' function is drafted as shown below. Provide code to replace each "XXX".

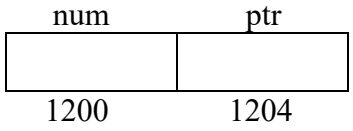
```
int binarySearch(const int list[], int numElems, int value)
{
        int first = 0;
        int last = XXX;
        int middle;
        int position = -1;
        bool found = false;

        while (XXX && XXX)
        {
                middle = XXX;
                if (list[middle] == value)
                {
                        found = XXX;
                        position = XXX;
                }
                else if (list[middle] > value)
                {
                        last = XXX;
                }
                else
                {
                        first = XXX;
                }
        }
        return position;
}
```

[18 points]

8) Suppose the variables ‘num’ and ‘ptr’, as shown below, are stored in memory addresses 1200 and 1204 respectively.

```
int num;
int* ptr;
```



Provide a clear description of the meaning of each of the following lines of code, and indicate the values that are displayed in output statements:

```
num=10;                          //

ptr = &num;                      //

cout << num << endl;             //

cout << &num << endl;            //

cout << *ptr << endl;            //

cout << ptr << endl;             //

cout << &ptr << endl;            //

cout << *ptr + 5 << endl;        //

cout << *ptr << endl;            //

*ptr = *ptr + 10;                //

cout << *ptr << endl;            //

*ptr += 15;                      //

cout << *ptr << endl;            //

cout << num << endl;             //
```