CS 1428 CREDIT BY EXAM
Sample Exam
MAX POINTS: 100

Questions 1-5: <u>circle</u> the letter of the best answer:

1. (**3 pts**) In any program that uses the `cin` object, you must include the _____.

   (a) compiler
   (b) iostream header file
   (c) linker
   (d) >> and << operators
   (e) none of the above

2. (**3 pts**) In the following C++ statement, what will be executed first according to the order of precedence?

   ```
   result = 6 – 3 * 2 + 7 – 10 / 2 ;
   ```

   (a) 6 - 3   (b) 3 * 2   (c) 2 + 7   (d) 7 -10   (e) 10 / 2

3. (**3 pts**) A variable whose value can be either true or false is of this data type.

   (a) string   (b) binary   (c) bool   (d) float   (e) None of these

4. (**3 pts**) How many times will the following loop display "Hello"?

   ```
   for (int i = 0; i < 20; i++)
       cout << "Hello!" << endl;
   ```

   (a) 19   (b) 20   (c) 21   (d) an infinite number of times

5. (**3 pts**) Which of the following is a valid C++ array definition?
   ```
   (a)int array[0];
   (b)float $payments[10];
   (c)void numbers[5];
   (d)int array[10];
   ```
   (e) None of these

6. **(15 pts)** Write a function that when passed an integer exam score will return (not print out) a character letter grade. Use the 90-80-70-60 scale, e.g if the function were passed 87, 'B' would be returned. The function should also validate the exam score and ensure that lies between 0 and 100. If the exam score is out of range the should return an error value (use the letter 'X').

7. (15 pts) Trace the following program and put the EXACT output in the box below. The input is shown in the box to the right.

```cpp
int main () {
    int foo;
    string str = "Junk";
    float foo2 = 6.5;
    int nums[4] = {9, 13, 11, 8};
    cin >> foo;
    while (foo > 2) {
        if (foo > foo2)
            cout << foo << " Go for it!" << endl;
        else {
            cout << foo << " " << str << endl;
            foo2 = foo2 - 1;
        }
        int index = foo % 4;
        nums[index] = foo;
        cin >> foo;
    }
    cout << endl;
    for (int i=0; i < 4; i++)
        cout << i << " - " << nums[i] << endl;
    return 0;
}
```

Input box:
```
3
6
2
-1
```

Output box:
```
3 Junk
6 Go for it!

0 - 9
1 - 13
2 - 6
3 - 3
```

8. **(15 pts)** Write the following function:

```
//Function - isOdd
//
//returns true if the input parameter is odd, otherwise false
//
//input parameter - positive integer > 0

bool isOdd (int n)
```

9. **(40 pts)** Write a program that reads monthly profit data for a company from the console (input from the user) and prints to the screen the average monthly profit and largest monthly profit.

   The user will type in one number per line and will enter a -1 to indicate the end of the data. You may assume the profit values will be non-negative. The number of profit values is not known beforehand, but you may assume there will not be more than 1200 values.

   Your program should define at least three functions:

   (i) A function **getProfitData**, that takes a double array (profits) and an integer (number of profits) as parameters. The function should populate the profits array with the data read from the user's input. The function should be void and pass the total number of profit values back to the caller, through the integer parameter using pass-by-reference.

   (ii) A function **averageMonthlyProfit** that takes a double array (profits) and an integer (number of profits) as parameters and computes and returns the average monthly profit.

   (iii) A function **largestMonthlyProfit** that takes a double array (profits) and an integer (number of profits) as parameters and returns the **index** (or subscript) of the month that had the largest profit. In other words, it returns the position in the array of the largest profit value.

   The main function should call each of the above functions with appropriate arguments and print the results (the average monthly profit and the index of the largest monthly profit) to the screen. Do not use global variables.