

Makeup Exam – Spring 2014

A) (10 points) Show what is printed by the following program:

```
#include<iostream>
#include<string>
#include<iomanip>
using namespace std;

int main()
{
    int chapter, page= 250, count = 0;
    string word = "junk";

    chapter = page/100;

    if (page >= 100)
    {
        cout << "We are past the introductory chapter!\n";
        word = "computer";
        page++;
    }
    else
    {
        cout << "Still at the beginning!\n";
        page--;
    }

    if (word < "computing")
        cout << "Word not exactly in dictionary\n";

    cout << "page " << '#' << page << endl;
    cout << "\tin chapter " << '#' << chapter << endl;
    cout << "\t\tup to word " << word << endl;

    return 0;
}
```

B) (30 points) Answer questions about short C++ code:

a) Suppose that the input is 1. What is the value of `alpha` after the following C++ code executes?

```
cin>> alpha;

switch(alpha)
{
case 1:
case 2:
    alpha++;
case 4:
    alpha++;
    break;
case 5:
    alpha = 3 * alpha;
case 6:
    alpha = alpha + 6;
default:
    alpha--;
}
```

b) What is printed by the following piece of code?

```
int count=270;

while (count < 273)
{
    count++;
    cout << count << "Good Luck!" << endl;
}
cout << "Done!?!";
```

c) What is the value of `counter` after the following statements executes?

```
counter = 20;
while (counter < 62)
{
    cout << counter;
    counter++;
}
```

d) Suppose that we have the following declarations:

```
int alpha;
```

```
double beta;
```

```
bool flag; //boolean is assigned either true or false
```

```
int x = 5, y = 20;
```

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

i) `alpha = 21 + 14 / 3 + 1;`

ii) `flag = (4 + x == 9 && 2 > y || y < 30);`

e) Show the contents of "out.txt" after the following code is run. Here is a picture of the input file:

3 5 6

```
int main()
{
int a, b, c;
ifstream inFile;
ofstream outFile;
inFile.open("data.txt");
outFile.open("out.txt");

inFile >> a >> b >> c;

outFile<< a << ' ' << b << ' ' << b - a << ' ' << a * b * c;

outFile.close();
inFile.close();
}
```

C) (40 points)Short Answer Questions:

For this section you may assume the following declarations:

```
int num;
double x , y, z, a, b, c;
char letter;
```

You may also assume that all the variables have values. When asked to write code in this section, do not write full programs.

a) Change the following switch statement to an if...else statement:

```
switch (letter)
{
case 'a':
case 'z':
    cout << "last or first";
    break;
case 'k':
case 'l':
case 'm':
case 'n':
case 'o':
case 'p':

    cout << "middle";
    break;
default:
    cout << "All rest!";
}
```

b) Write the C++ code that assigns the variable x the value of the expression

$$-b + \frac{a^2}{c}$$

- c) Use a loop: Write the C++ code that prints out the numbers from 1 to 100 and their squares (the number raised to the 2 power) and cubes (the number raised to the 3rd power). Your output should be:

```
1  1  1
2  4  8
3  9  27
4  16 64
etc.
```

- d) Write the C++ code that prints out *yes* if the the following two conditions are BOTH true:

- i) variable `num` is divisible by either 10 or 4
- ii) the `letter` is a after 'M' in the alphabet

Otherwise *no* will be printed.

- e) Write the C++ code that allows the user to enter 100 numbers. Your program prints out the sum of the 25 numbers. (YOU MUST USE A LOOP!)

D) (20 points) Write a COMPLETE C++ program (including comments!) that asks the user to input the number of total `hours` it took for the computer to process the result of a complicated program. The program then prints the duration of the job in a nicer form; i.e. it prints out the number of total `weeks`, then (for the part left over) `days` and (for the part left) `hours` that the job took. For example, if the user types in 362 for the `hours`, the output will be:

2 weeks(s) and 1 day(s) and 2 hours(s)

Remember that there are 24 hours in a day and 7 days in a week. You may assume that there are no leap years!

Extra Credit: The (s) above is in parenthesis. Have it singular or plural according to the number. So above would print:

2 weeks

1 day

2 hours