Foundations of Computer Science (COP3014) Summer 2016 Bullard 100 pts
TEST#1

Name:_____Z#:_____

True/False (Total Point 50 – 2 points each)

1.____T____The open function binds a stream to a filename.
2.____F____A break statement in a switch stops your program.
3.____F____A stub is used to test the functionality of your program.
4.____F____A function may return more than one item.
5.____F____A pointer and a reference are the same thing.
6.____F____A stub is a function that is completely defined and well tested.
7.____F____A void function can be used in an assignment.
8.____F____A void function can return any value.
9.____T____A void function may not be used in an output statement.
10.___F_____The formal parameters appear in the function call.
11.___T____All switch statements can be converted into nested if-else statements.
12.___T____Functions can return at most one value.
13.__T____In a function with call-by-reference parameters, any changes to the formal parameters will change the actual arguments passed to the function.
14.__F_____In a function with call-by-reference parameters, the values of the actual arguments are passed to the function.
15.___T____It is acceptable to have both call-by-value and call-by-reference parameters in the same function declaration.
16.___F____It is illegal to call other functions from inside a function definition.
17.___F____The types of parameters are optional in the function declaration.
18.____T___It is possible to have a function that has no parameters.
19.___T____Streams may be passed to a function.
20.___F____"<<" is the extraction operator which is used with an input stream.
21.__F_____A "switch" statement is more powerful than an if/else statement.
22.___T____The scope is a region in a program where a name has meaning.
23.___T____A call-by-value occurs when a copy of the actual argument is place in the formal parameter.
24.___T____Top-down design is a divide-and-conquer method that programmers use to help them debug programs.
25.__F_____You may not have more than one input and one output stream open at any one time.

Short Code and Short Answer Questions (Total Point 50 – 5 points each)

26. Write the prototype for an integer function called "Compter_Results" that has 3 double input parameters (x, y and z) and 2 integer output parameters (p and q).

```
int Computer_Results(double x, double y, double z, int & p, int & q);
```

27. Implement the void function "ReadFile" that will have two parameters: an input file stream called "in", and a patient medical record called "patient_record1". The function will read the room_number (integer), age (integer), and hospital_wing (string: north, south, east or west), into a patient record from the data file. Assume that the input file stream is already open. Following is the declaration of the patient record:

```
class patient_record
{
 public:
   int room_number, age;
   string hospital_wing;
};


void ReadFo;e(ifstream & in, patient_record & patient_record1)
{
    if (!in.eof())
    {
       in>>patient_record1.room_number>>patient_record1.age>>patient_record1.hospital_wing;
    }
}
```

Short Code and Short Answer Questions continued….

28. Implement the void function "WriteFile" that will have two parameters: an output file stream called "out", and a patient medical record called "patient_record1". The function will write the room_number (integer), age (integer), and hospital_wing (string:north, south, east or west), from the patient record to the data file. Assume that the output file stream is already open. Consider the following patient record declaration when answering this question:

```
class patient_record
{
 public:
   int room_number, age;
   string hospital_wing;
};


 void WriteFile(ofstream & out, patient_record Patient_recordl)
 {
          out<<patient_record1.room_number<<"  "
              <<patient_record1.age  << "  "
              <<patient_record1.hospital_wing <<endl;
  }
```

Short Code and Short Answer Questions continued….

29. Does the following sequence produce a division by zero? Explain your answer. Assume the code is correct.

```
j=-1;
if ((j>0) && (1/(j+1) > 10))
      cout<<j<<endl;
```

No because of short circuit evaluation. j>0 is false.

30. If a programming language does not use short-circuit evaluation, what is the output of the following code fragment if the value of myInt is 0?

```
int other=3, myInt;

if(myInt !=0 && other % myInt !=0)
          cout << "other is odd\n";
else
          cout << "other is even\n";
```

Will produce a runtime error cause by other % myInt != 0.

Short Code and Short Answer Questions continued….

31. What is the output of the following code with the given input: Assume the code is correct.

Input: 11 3

```
#include <iostream.h>

int main()
{
  int x, y;

  cout << "Enter two integers in the range 1-20: ";
  cin>> x >> y;
  for (int i =1; i<=y; i++)
  {
    for (int j = 1; j <= x; j++)
       cout << '@';
    cout <<endl;
  }
  return 0;
}
```

Output:

@@@@@@@@@@@
@@@@@@@@@@@
@@@@@@@@@@@

Short Code and Short Answer Questions continued….

32. What is the output of the following code: Assume the code is correct.

```
int main()
{
    int i,j,k=2,count=1;

    for (i=0; i<1; i++)
    {
        count+=1;
        for (j=0;j<2; j++)
        {
              count+=count;
              for (;k<4;)
              {
                  count+=count;
                  k++;
               }
         }
        cout<<count<<endl;
    }
    cout << count << endl;
    return 0;
}
```

Output:
32
32

Short Code and Short Answer Questions continued….

33. Complete the function whose header is given below:

```
bool Is_Vowel(char ch)
//postcondition: returns true if ch is a vowel and false
//              otherwise.  A vowel is a letter other
//              that a,e,i,o,and u.

{
   return ch=='a' || ch =='e' || ch == 'I' || ch =='o' || ch =='u';
}
```

Short Code and Short Answer Questions continued….

34. Complete the function whose header is given below:

```
int Tax_Bracket(double income )
//postcondition: returns 1 if  income is greater than $0 but less than $10k (10,000);
//                    returns 2 if income is greater than or equal to $10K but less than $20K;
//                    returns 3 if income is greater than or equal to $20K but less than $50k;
//                    returns 4 if income is greater or equal to 50K
```

See programming assignments.

Short Code and Short Answer Questions continued….

35. Implement a main function that uses each function declared below:

```
int Find(const string & key);
void Calculate(int, int, int);
void Print(char, double);
void Open(string &);

int main()
{
  string key = “hello”;
 int I = 5;
char c =’c’;
double d = 5.678

cout<<Find(key);
Calculate(5,5,5);
Print(c,d);
Open(key);

return 0;
}
```

THE FOLLOWING ARE DIFFERENT FORMS OF QUESTIONS DONE IN LIVE LECTURE.

What is the output of the following code with the given input: Assume the code is correct.

Input: 9 4

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

      int main()
      {
         int x, y;

         cout << "Enter two integers in the range 1-20: ";
         cin>> x >> y;
         for (int i =1; i<=y; i++)
         {
           for (int j = 1; j <= x; j++)
              cout << "0+1";
           cout <<endl;
         }
         return  0;
       }
```

output:

Enter two integers in the range 1-20:
0+10+10+10+10+10+10+10+10+1
0+10+10+10+10+10+10+10+10+1
0+10+10+10+10+10+10+10+10+1
0+10+10+10+10+10+10+10+10+1

Implement a main function that uses each function declared below:

int Find(string & key);

```
void Calculate(int *, int &, int);

int main()
{
    string key = “hello”;
    int a =5, b=6, c=7;

    cout << Find(“hello”);
    Calculate(&a, b, c);

    return 0;
}
```

Implement the bool function “WriteFile” that will have two parameters: an output file stream called “out”, and a patient medical record called “patient_record1”. The function will write the room_number (integer), age (integer), and hospital_wing (string:north, south, east or west), from the

patient record to the data file. The function will return false if age is greater than 20; otherwise the function returns true. Assume that the output file stream is already open. Consider the following patient record declaration when answering this question:

```
class patient_record
{
 public:
   int room_number, age;
   string hospital_wing;
};
```

```
bool WriteFile(ofstream & out, const patient_record &patient_record1)
{
   out << patient_record1.room_number << patient.record1.age
        << patient_record1.hospital_wing<<endl;

   if (patient_record1.age > 20
      return   false;
   else
      return true;
}
```

Write the prototype for a void function that has 2 string output formal parameters and 1 double input formal parameter.

```
void function_name(string & formal_parameter1,
                   string & formal_parameter2,
                   double formal_parameter3);


void function_name(string &,
                   string &,
                   double);
```

Implement the int function "ReadFile" that will have two parameters: an input file stream called "output", and a patient medical record called "patient_record1". The function will read the room_number (integer), age (integer), and hospital_wing (string: north, south, east or west), into a patient record from the data file. The function will return the 30 times the age of the patient. Assume that the input file stream is already open. Following is the declaration of the patient record:

```
class patient_record
{
 public:
   int room_number, age;
   string hospital_wing;
};
```

```
int ReadFile(ifstream &output, patient_record & patient_record1)
{
   output >> patient_record1.room_number >> patient_record1.age
      >> patient_record1.hospital_wing;

  return (patient_record1.age) *30;
}
```