Date: 17/04/2018
Duration: 90 min.

Number: ....   **Name :** ....

Q1) [10pts] Complete the given C program that asks the user to input the sum and the difference of two real numbers, and then it will find the corresponding numbers and print them. A sample execution of your program is shown below

Enter sum and difference of 2 real numbers > 16.80 18.6

Number1=13.700000

Number1=3.100000

```
#include <iostream>
using namespace std;
int main(){double sum, dif, number1, number2;
cout<<"Enter the sum and the difference of two real numbers >";
cin>>sum>>dif;
```
// write the process to find number1 and number2

....

....
```
cout<<"number1="<<number1<<"\n"<<"number2="<<number2;
return0;}
```

Q2) [10pts] What is the output of the following code fragment?

A/ int x=0;
    while(x < 5)
      cout << x;
      x ++;
	B/ int grade=80;
	    if(grade >= 60)
	      cout<< "You passed. ";
	    else;
	      cout<< "You failed.";

Q3)[20pts] Write a C++ program that asks the user to enter a letter grade, then it will display one of the following messages. **You must use switch statement. You are NOT allowed to use if/else statement.**
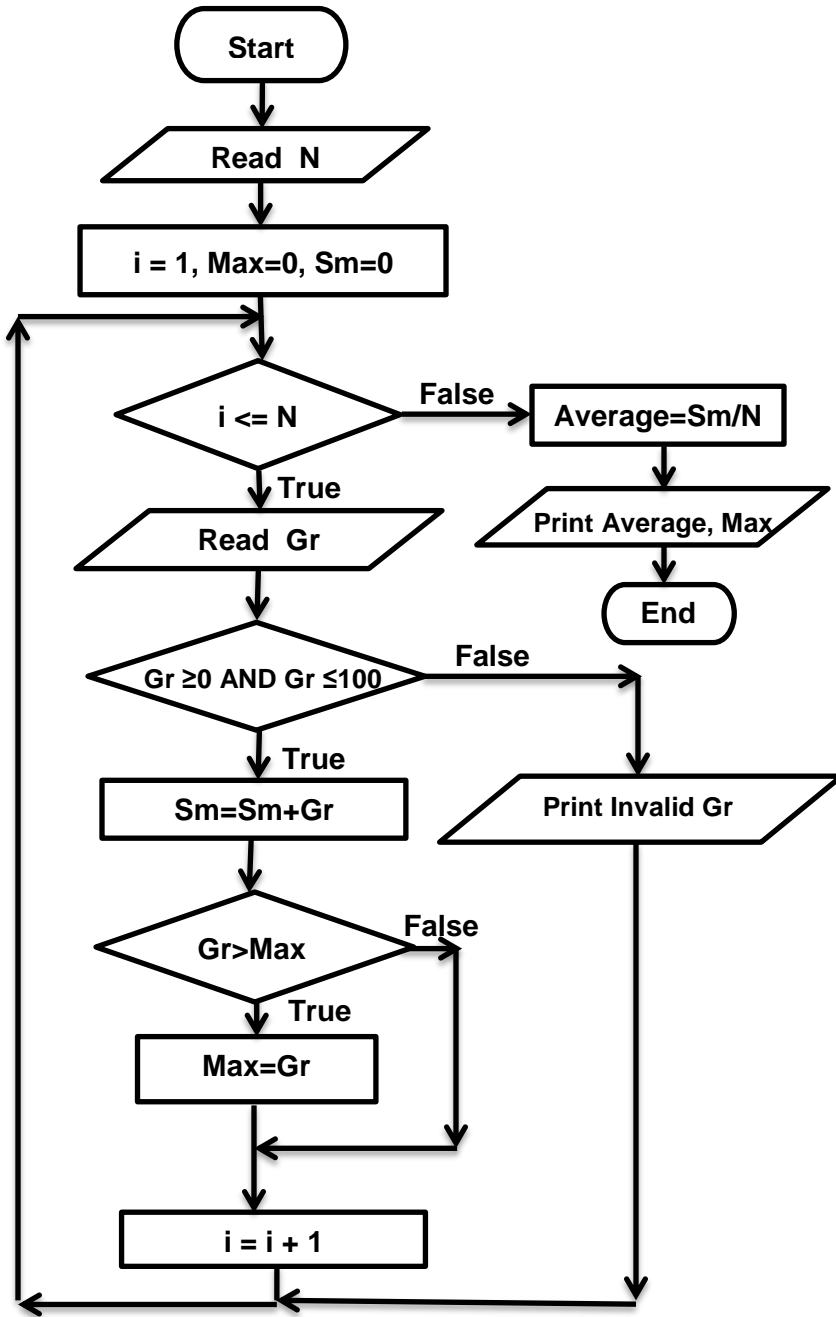
Letter typed by the user	Message displayed
'A' or 'a'	Excellent
'B' or 'b'	Very Good
'C' or 'c'	Average
'D' or 'd'	Poor
Any other character	Wrong input

Sample run 1:

letter typed is d

Poor

Sample run 2:

letter typed is h

Wrong input

```
#include<iosteam>

using namespace std;

int main(){char grade;

cout<<"Enter a letter grade >";

cin>>grade;

……………………………………………
……………………………………………
……………………………………………
……………………………………………
……………………………………………
……………………………………………
……………………………………………
……………………………………………
……………………………………………
……………………………………………
return 0;}
```

Q4) [25pts] The following flowchart is designed to read from the keyboard the Grades of N students, and then it computes and prints on the monitor the maximum grade and the average grade. Implement this flowchart in C++ language.


```cpp
#include<iostream>

using namespace std;

int main(){

int Gr,N,i=1,Sm=0,Max=0;

double average;

cin>>N;

.............................................

.............................................

.............................................

.............................................

.............................................

.............................................

.............................................

.............................................

.............................................

.............................................

.............................................

Average= (double) Sm/N;

cout<<"The maximum is "<<Max<<endl;

cout<<"The Average is "<<Average<<endl;

return 0;}
```

Q5) [15pts] The following code reads different integer numbers from the keyboard. **It finds the sum of even numbers and it excludes from the sum those integers that are divisible by 5. The code will stop if the input number is 0.**
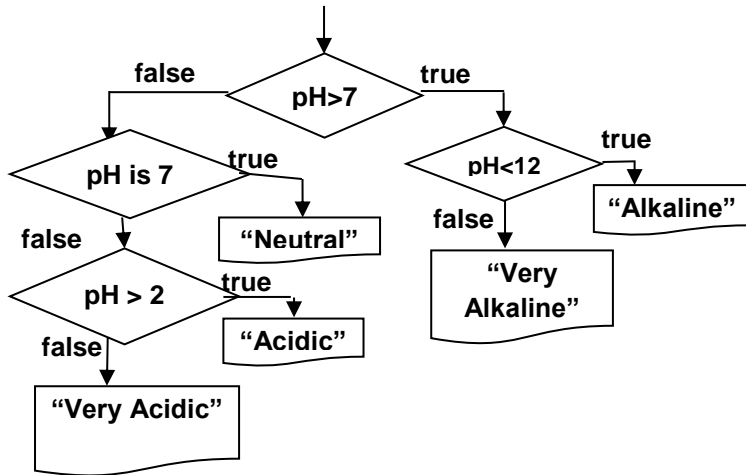For example, if the input is

    3 6 10 12 14 16 20 0

Then, the sum will be

    Sum=6+12+14+16=48 (10 and 20 are excluded as they can be divided by 5 without a reminder)

Complete the code to accomplish this task.

```cpp
#include <iostream>

using namespace std;

int main()
{    int n, Sum=0;

    // construct infinite loop

    while(…………………………………..)
    {

     cin>> n;
    // terminate the code if the input is 0

    ………………………………………………………………………………………………………

    // find the sum of even number but

    // do not include those numbers that are divisible by 5


    ………………………………………………………………………………………………………

    }
    cout<<"Sum="<<Sum;
 return 0;}
```

Q6)[20pts] Consider the following flowchart. Assume that it will be implemented using simple if statements (if without else or else if). Put the correct condition for each of if statements so that the corresponding message is printed.

Condition of if statement	Printed message
if( )	Very Acidic
if( )	Acidic
if( )	Neutral
if( )	Very Alkaline
if( )	Alkaline