Number: ……………………… **Name-Surname :** ……………………….............. **Group:** ....

Q1	Q2	Q3	Q4	Q5	Q6	Total
/18	/12	/20	/15	/20	/15	/100

Q1) [18pts] The following code may contain errors, correct these errors (if any). **In case no error, do not write anything.**

```
include<iostream>
Using namesapce std;
#define FACT = 5.0/9
int MAIN()
{Double TFah, TCel;
cin<<TFah;
TCel=Fact*(tFah-32.0);
cout>>"Celsius temperature is">>TCel;
return 0}
```

```
#include<iostream>
using namesapce std;
#define FACT  5.0/9
int main()
{double TFah, TCel;
cin>>TFah;
TCel=FACT*(TFah-32.0);
cout<<"Celsius temperature is"<<TCel;
return 0;}
```

Q2) [12pts] What is the output of the following code fragments?
Each code fragment is independent from the others.

```c++ int i; cin>>i; switch(i) { case 4: i=i+3; case 3: case 1: i=i+1; case 6: break; case 7: i=i+2; break; case 8: i=i+2; default : i=i+1; } cout<<i<<endl; ```	**6 points**

```
int i;
 cin>>i;
 switch(i) {
  case 4: i=i+3;
  case 3:
  case 1: i=i+1;
  case 6: break;
  case 7: i=i+2;
          break;
  case 8: i=i+2;
  default : i=i+1;
  }
  cout<<i<<endl;
```

6 points

input	output
6	6
4	8
2	3
7	9
3	4
8	11

```
int x;
cin>>x;
if(x > 5 ) {
  if(x< 10){
    if(x>=8)
        cout<<"DD";
    else
        cout<<"EE";
  }
  else{
    if ( x >= 0)
      cout<<"BB";
    else
      cout<<"AA";
  }
}
else
cout<<"CC";
```

6 points

input	output
3	CC
7	EE
9	DD
11	BB

Q3) [20pts] The **area** of a triangle with sides **A**, **B**, and **C** is calculated as

$$Area = \sqrt{S(S-A)(S-B)(S-C)}$$

Where **S=P/2** and **P** is the triangle **perimeter** computed as

$$P=A+B+C$$

Write a code to read the coordinates of three points that form the triangle vertices **P1(x1,y1)**, **P2(x2,y2),** and **P3(x3,y3)** and computes and prints on the monitor the **perimeter** and the **area** of the triangle. Note the distance between two points, **P1** and **P2** for example, is computed as

$$Distance = \sqrt{(x2-x1)^2 + (y2-y1)^2}$$

Note: Let all variables be of type double. A sample run of the code can be as

```
Enter the coordinates of point 1: 2  5
Enter the coordinates of point 2: 2  8
Enter the coordinates of point 3: 6  8
The triangle perimeter is 12.0
The area of the triangle is 6.0
```
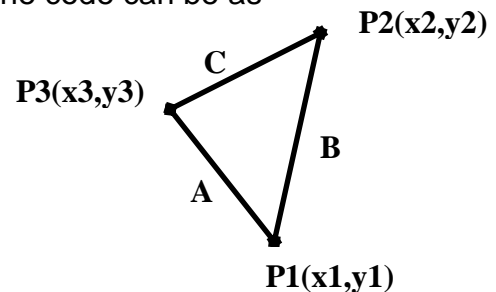


```cpp
#include<iostream>
#include<cmath>
using namesapce std;
int main(){
//declare the variables
double x1,y1,x2,y2,x3,y3,A,B,C,P,S,area;
// write necessary statements to read input from keyboard
cout<<"Enter the coordinates of point 1:";
cin>>x1>>y1;
cout<<"Enter the coordinates of point 2:";
cin>>x2>>y2;
cout<<"Enter the coordinates of point 3:";
cin>>x3>>y3;
//perform the required operations
A=sqrt((x3-x1)*(x3-x1)+(y3-y1)*(y3-y1));
B=sqrt((x2-x1)*(x2-x1)+(y2-y1)*(y2-y1));
C=sqrt((x3-x2)*(x3-x2)+(y3-y2)*(y3-y2));
P=A+B+C;
S=P/2;
area=sqrt(S*(S-A)*(S-B)*(S-C));
//show the output(s) on the monitor
Cout<<"The triangle perimeter is "<<P<<endl;
Cout<<"The area of the triangle is "<<area<<endl;
return 0;}
```

Q4-) (15 pts.) Complete the missing parts in the following C++ program with considering the comments given in the program. A sample output of the program is given below. Assume that following 10 numbers {1, 4, 2, 8, 3 ,9 ,5, 10 ,7, 6} are asked to user to enter them from keyboard. **Note that you MUST fill only the corresponding boxes.**

```cpp
#include <iostream>
using namespace std;
int main( ) {
        int i, number, N=10;
        int min=1000;
        int max=-1000;;
        for(i=0 ; i<N ; i++)
        {
                cout<<"Enter a number : ";
                cin>> number;
                if( number%2==0 )  /*Checks if the  number is divisible by 2*/
                {
                        if(    number <min            ) /*Checks if the number is minimum*/
                                min=       number      ;
                        if(    number >max            ) /*Checks if the number is maximum*/
                                max=    number      ;

                }
        }
/*The for loop above searches such numbers to find minimum element that can be divisible
by 2 and its maximum element that can be divisible by 2. */

        cout<< "Minimum number which can be divisible by 2 is " <<  min    << endl;

        cout<< "Maximum number which can be divisible by 2 is " <<   max       << endl;

    return 0;
}
```
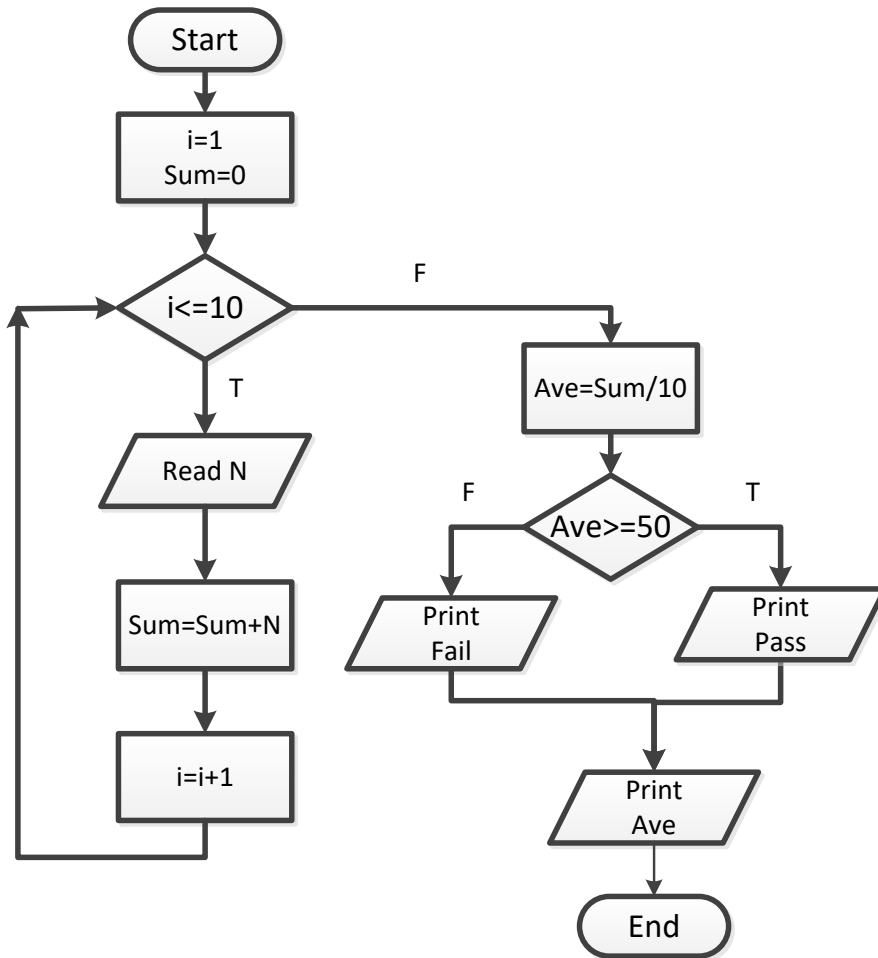
Q5) (20pts.) Design an algorithm or draw a flowchart for a computer program that finds the average of 10 input numbers entered by the user and prints "pass", if average is greater than or equal to 50, otherwise prints "fail". At the end it must print computed average as well.

Flowchart

```
                    Start
                      |
                    i=1
                   Sum=0
                      |
          _____        F
         /    i<=10          \------------------>
         _____/                   |
                  | T                       Ave=Sum/10
                  |                              |
              Read N          F                  |        T
                  |          _____
              Sum=Sum+N     /        Ave>=50              \
                  |         _____/
                  |            |                        |
               i=i+1        Print                    Print
                  |         Fail                     Pass
                  |            |_____|
                  |                      |
                  |                   Print
                  |                    Ave
                  |                      |
                                       End
```

Algorithm

1. **Begin**
2. **i=1, Sum=0**
3. **While(i<=10)**
        Read N
        Sum=Sum+N
        i=i+1
    while-end
4. **Ave=Sum/10**
5. **If (Ave>=50)**
        Print Pass
    Else
        Print Fail
6. **Print Ave**
7. **End**

Q6) (15 pts.) Complete the missing parts in the following C++ program which calculates the sum of the entered numbers that are not multiples of seven. The program terminates when zero is entered.

```cpp
#include <iostream>
using namespace std;
main()
{
  int n, sum=0;

  while(1)
  {
    cin>> n;

    if(n == 0) _____break_____;

    if(n % 7 == 0) _____continue_____;

      ____sum += n_____;
  }
  cout<<" Sum:"<<sum;

  }
  return 0;
}
```