



Programming Fundamentals

[MID TERM EXAM]



APRIL 18, 2020

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Q.1

A) Draw the flowchart and write a C++ program to get two integers items from keyboard and then display to the screen their sum, difference, product and quotient.

CODE:

```
#include <iostream>

using namespace std; int
main()
{
    int a,b,sum,difference,product,quotient;
    cout<<"Enter first integer"; cin>>a;
    cout<<"Enter second integer=";
    cin>>b; sum=a+b;
    cout<<"Sum of Two Integer is "<<sum<<endl;
    difference=a-b;
    cout<<"Difference of Two Integer is "<<difference<<endl;
    product=a*b;
    cout<<"Product of Two Integer is "<<product<<endl;
    quotient=a/b;
    cout<<"Quotient of Two Integer is "<<quotient<<endl;
    return 0;
}
```

OUTPUT:

Enter first integer5

Enter second integer=6

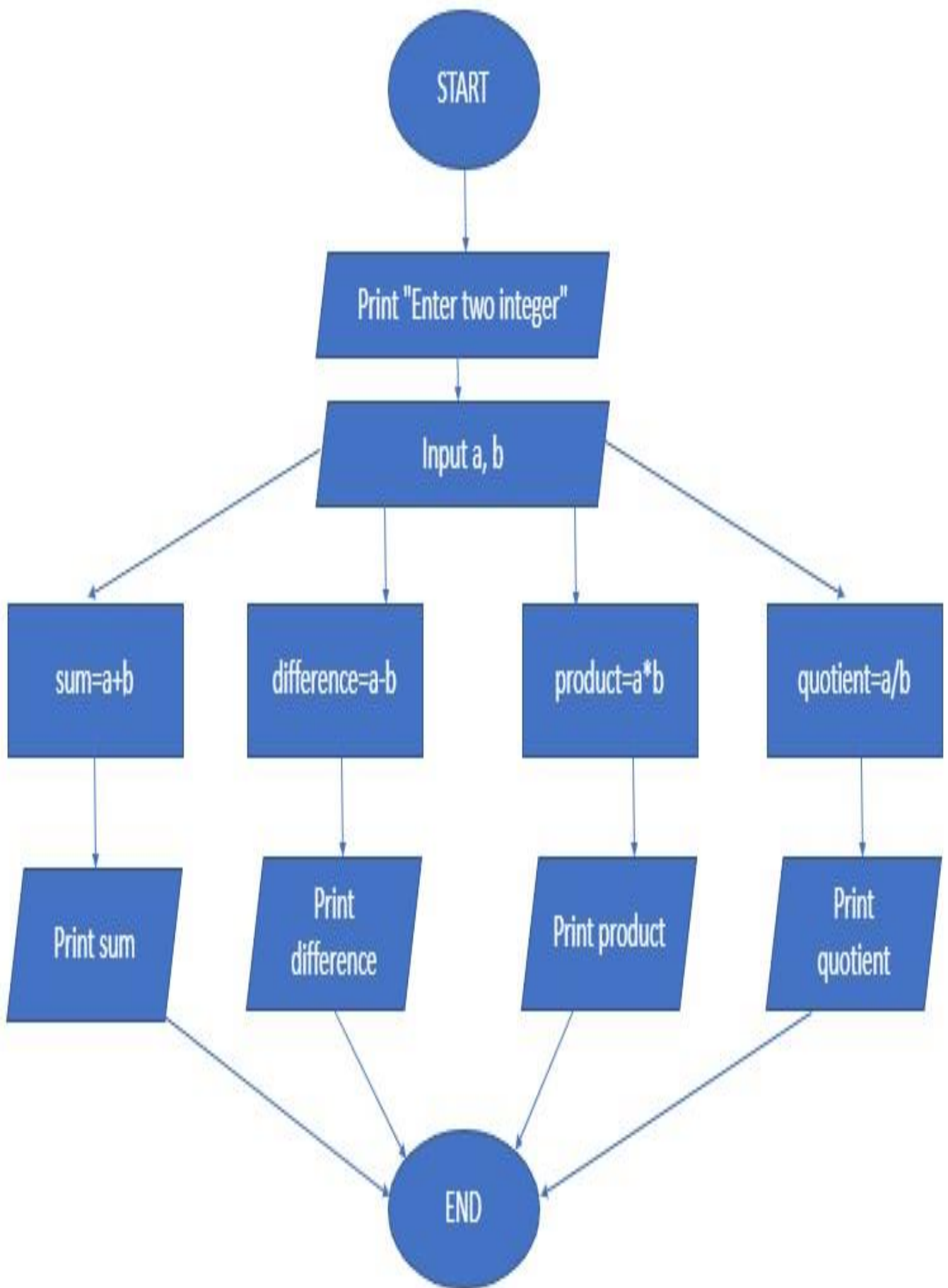
Sum of Two Integer is 11

Difference of Two Integer is -1

Product of Two Integer is 30

Quotient of Two Integer is 0

FLOWCHART:



B) Draw the flowchart and write C++ program to prompt the user for temperature in degrees Celsius (C), then convert the temperature in degrees Fahrenheit (F) using the following formula and display temperature in Fahrenheit (F) on monitor.

$$F = 9/5 \times C + 32$$

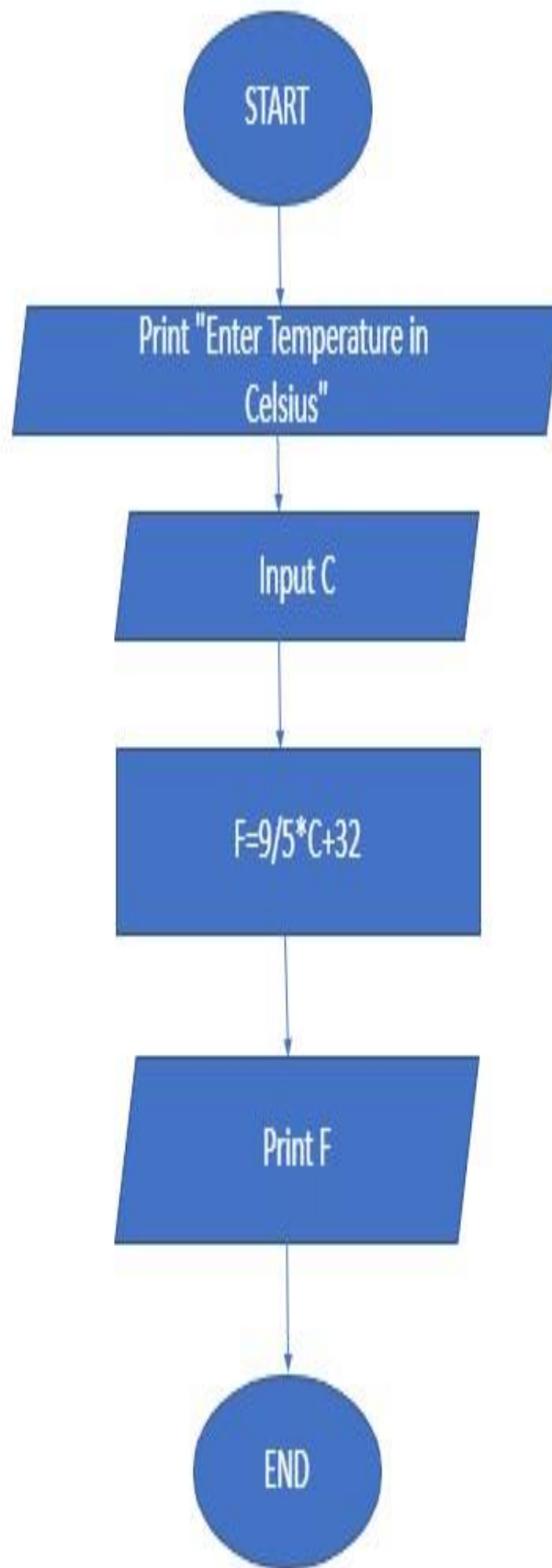
CODE:

```
#include <iostream>
using namespace std; int
main()
{
    float C,F;
    cout<<"Enter Temperature in Celsius=";
    cin>>C;
    F=9/5*C+32;
    cout<<"Temperature in Fahrenheit is "<<F<<" degree"<<endl;
    return 0;
}
```

OUTPUT:

```
Enter Temperature in Celsius=33 Temperature
in Fahrenheit is 65 degree
```

FLOWCHART:



Q2.

A) Draw the flowchart and write a C++ program that will prompt an operator to input three characters, receive those three characters, and display a welcoming message to the screen such as **'Hello xxx! We hope you have a nice day.'**

CODE:

```
#include <iostream>
using namespace std; int
main()
{
    char ch1,ch2,ch3;
    cout<<"Enter first character=";
cin>>ch1;
    cout<<"Enter second character=";
cin>>ch2;
    cout<<"Enter third character=";
cin>>ch3;
    cout<<"Hello "<<ch1<<ch2<<ch3<<" ! We hope you have a nice day.";
return 0;
}
```

OUTPUT:

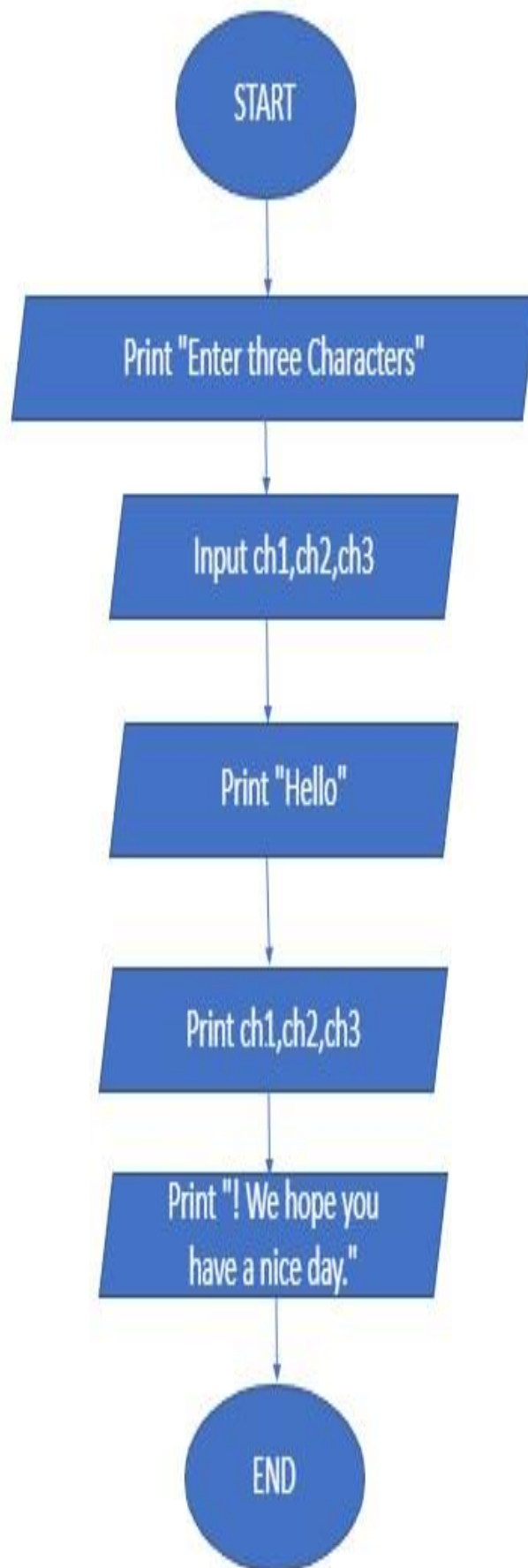
Enter first character=s

Enter second character=a

Enter third character=m

Hello sam ! We hope you have a nice day.

FLOWCHART:



B) You were asked by your project leader to write a simple program that obtains the radius of a circle. The program calculates the area and perimeter then prints radius, the area and the perimeter. **Draw the flowchart and write a C++ program.**

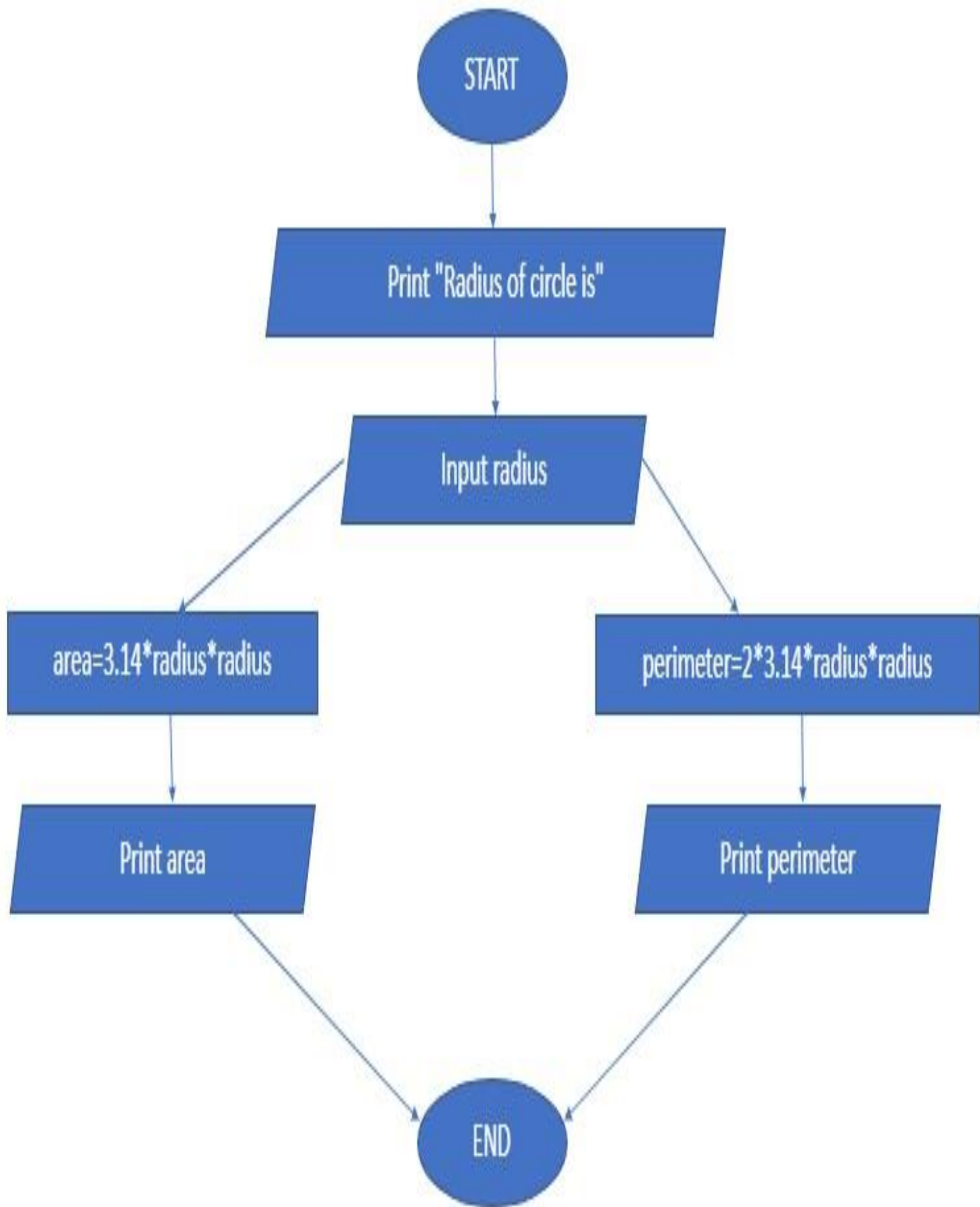
CODE:

```
#include <iostream>
using namespace std;
int main()
{
    float radius,area,perimeter;
    cout<<"Radius of a circle is ";    cin>>radius;
    area=3.14*radius*radius;
    cout<<"Area of Circle is "<<area<<endl;
    perimeter=2*3.14*radius;    cout<<"Perimeter of a Circle
is "<<perimeter<<endl;    return 0;
}
```

OUTPUT:

Radius of a circle is 8
Area of Circle is 200.96 Perimeter
of a Circle is 50.24

FLOWCHART:



Q3

A) A Student has to take three tests per semester. Each test has maximum marks of 50. By using a system, lecturer can enter marks obtained for each test as input. **Draw a flowchart and write C++ program to** calculate the percentage obtained by the student. Print the result.

CODE;

```
#include <iostream>

using namespace std;

int main()
{
    int test1,test2,test3,total; float
percentage; cout<<"Mark of first
test out of 50="; cin>>test1;

    cout<<"Mark of second test out of 50=";
cin>>test2;

    cout<<"Mark of third test out of 50=";
cin>>test3;

    if(test1<=50) if(test2<=50) if(test3<=50)
total=test1+test2+test3; percentage=
total*100/150; cout<<"Total marks out of
150="<<total<<endl;

cout<<"Percentage="<<percentage<<endl;
cout<<"A student get "<<percentage<<"% marks.";
return 0;
}
```

OUTPUT:

Mark of first test out of 50=44

Mark of second test out of 50=22

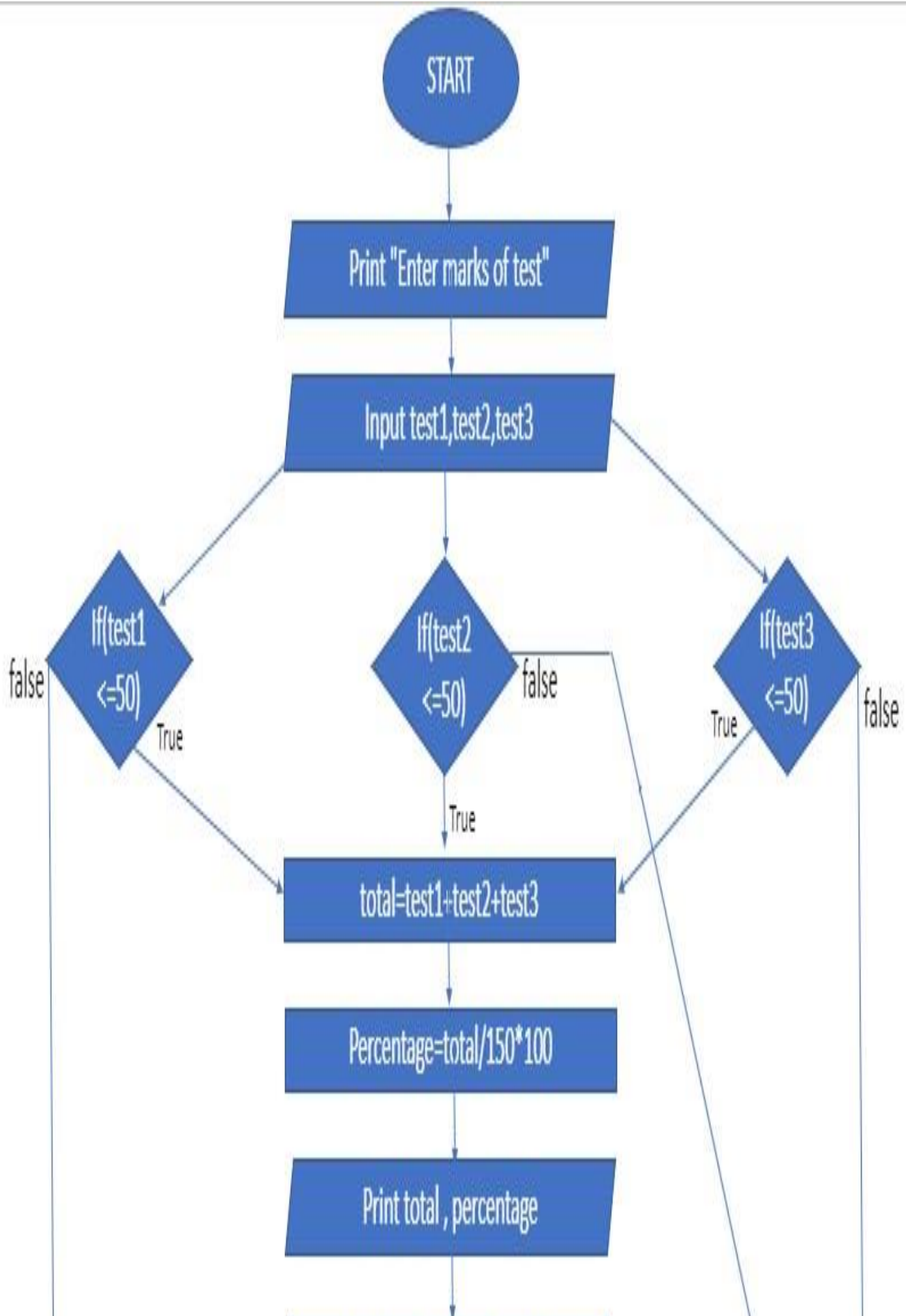
Mark of third test out of 50=44

Total marks out of 150=110

Percentage=73

A student get 73% marks.

FLOWCHART:



B) Draw the flowchart and write a C++ program to calculate energy needed to heat water from an initial temperature to a final temperature. The user will enter the water amount (in kilograms) and its initial and final temperatures. The formula to compute the energy is

$$Q=M*(\text{final temperature} - \text{initial temperature})*4184$$

Where M is the weight of the water (in kilograms), temperatures are in Celsius and energy Q is measured in joules.

CODE:

```
#include <iostream> using
namespace std; int main()
{
    float M,initialtemp,finaltemp;
double Q;
    cout<<"Enter the amount of water in kilogram=";
cin>>M;
    cout<<"Enter Initial Temperature in Celsius=";
cin>>initialtemp;
    cout<<"Enter Final Temperature in Celsius=";
cin>>finaltemp;
    Q=M*(finaltemp-initialtemp)*4184; cout<<"Energy
needed to heat water in joule is "<<Q; return 0;
}
```

OUTPUT:

Enter the amount of water in kilogram=45.5

Enter Initial Temperature in Celsius=33.5

Enter Final Temperature in Celsius=22.5

Energy needed to heat water in joule is -2.09409×10^6

FLOWCHART:

