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# Programming Fundamentals

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[MID TERM EXAM]



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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

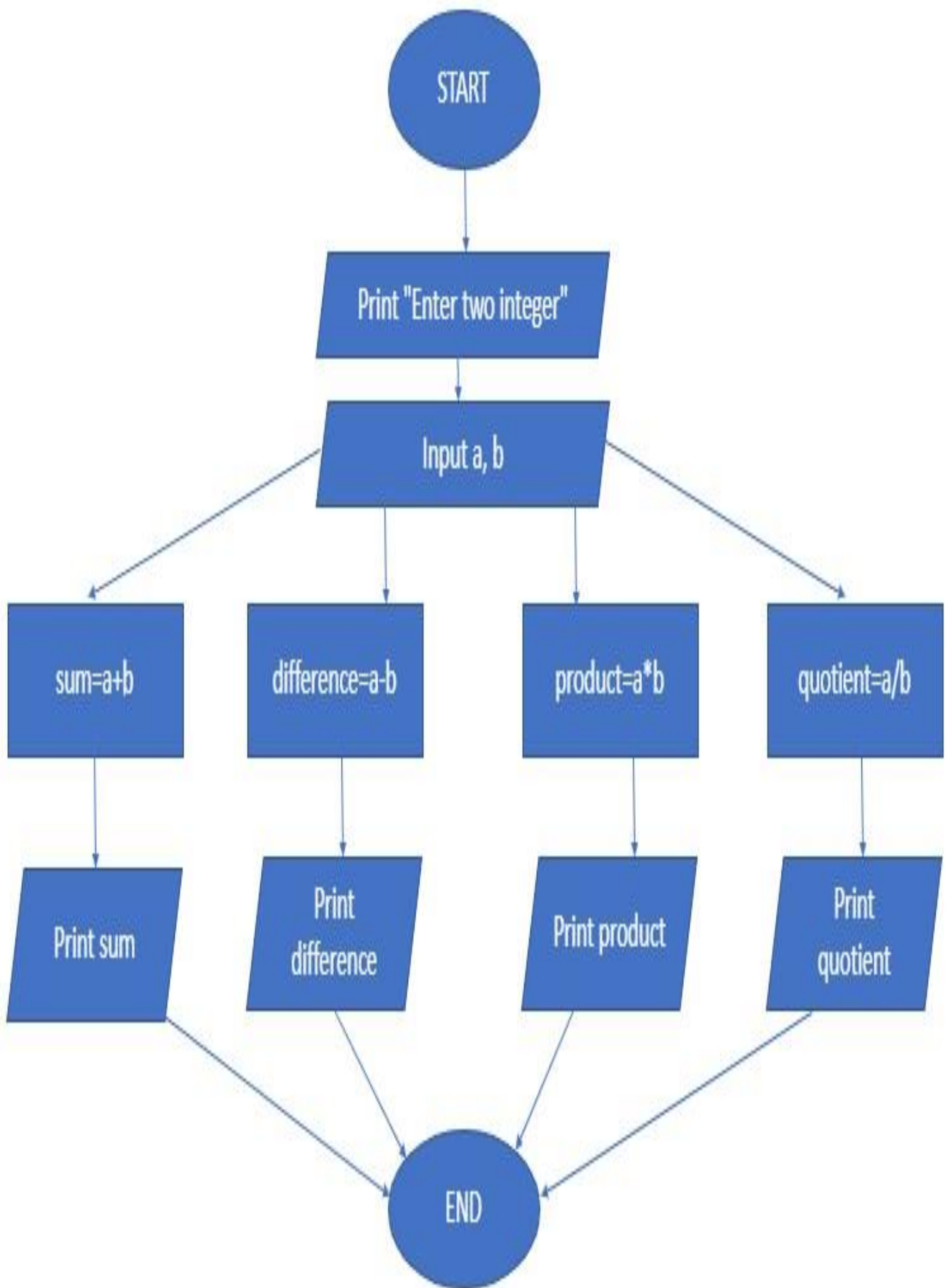
Sum of Two Integer is 11

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.

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

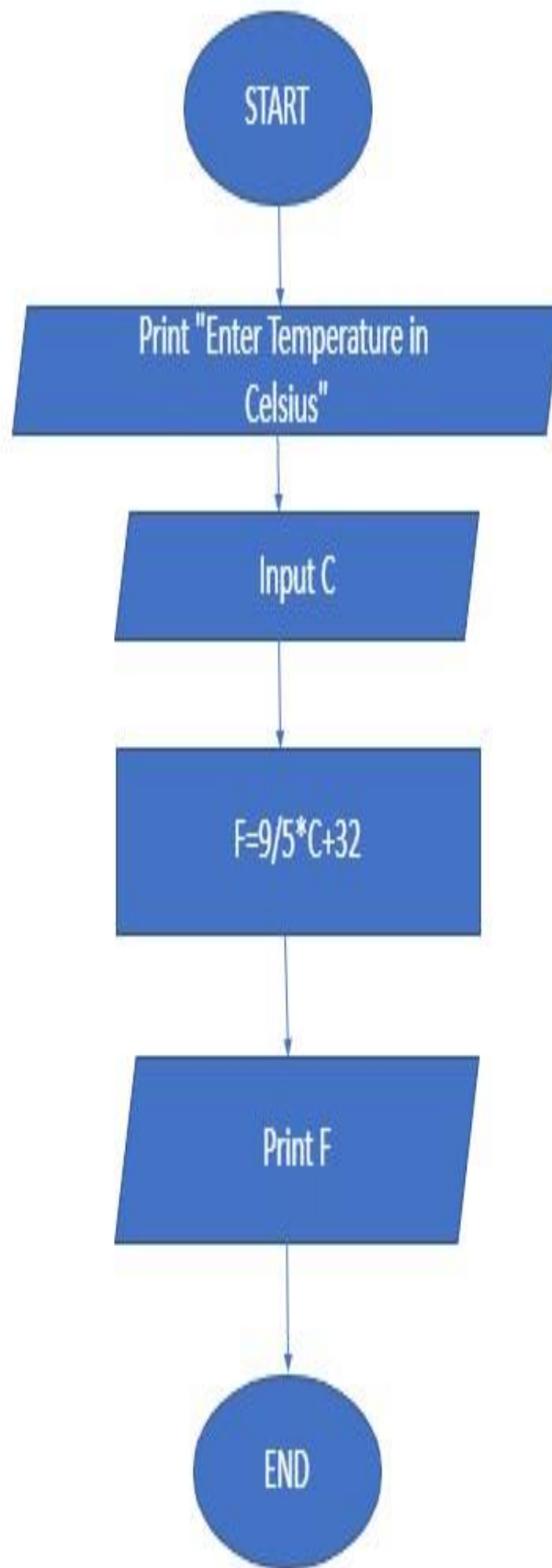
### **CODE:**

```
#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

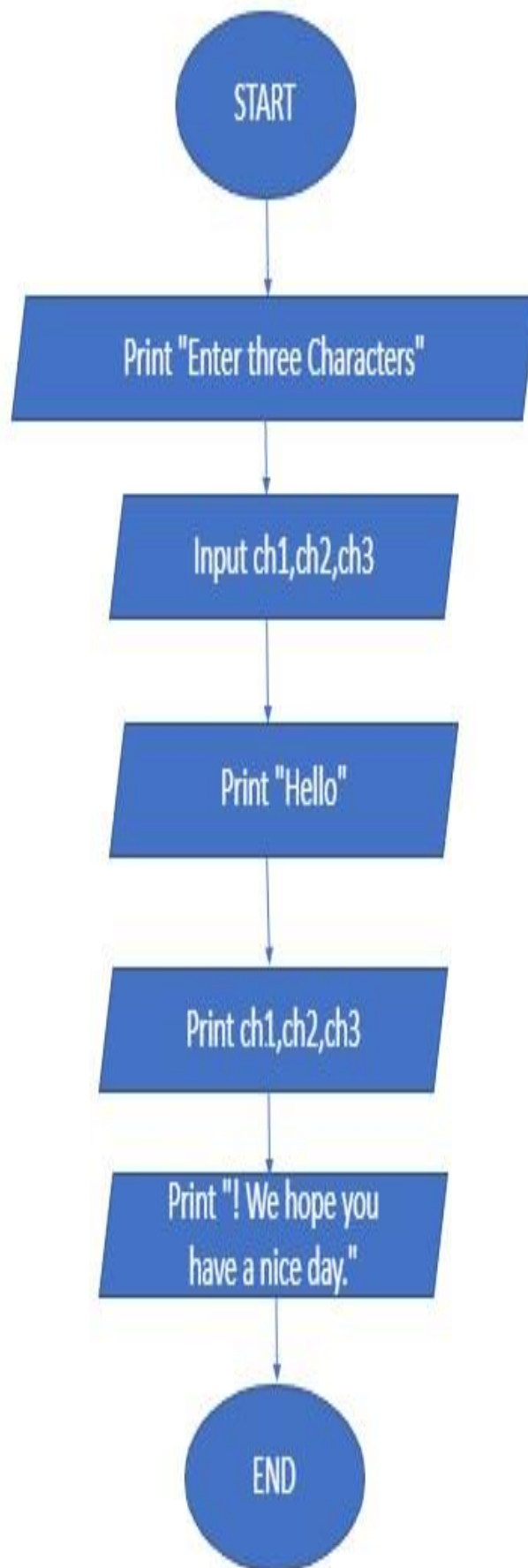
Enter second character=a

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.**

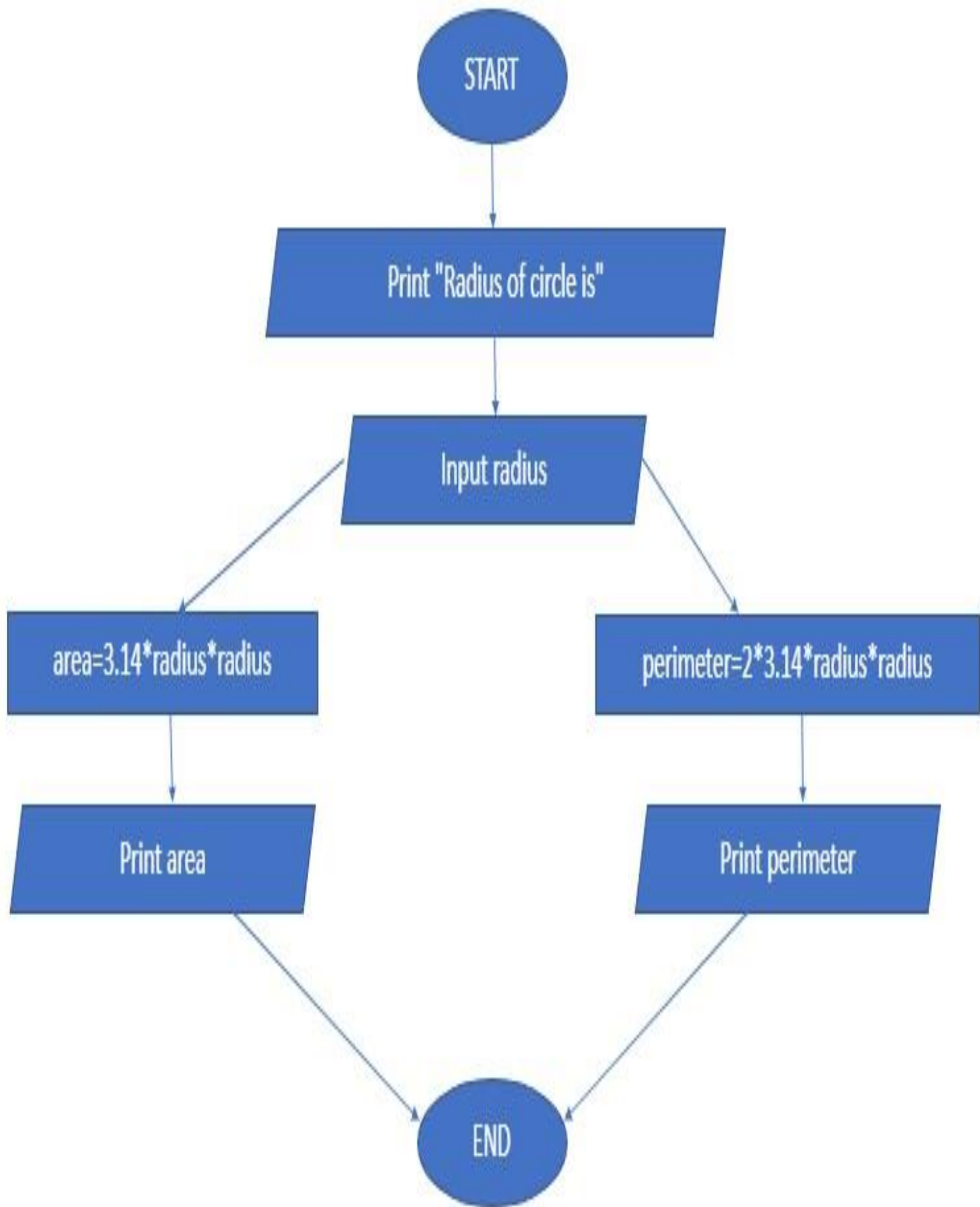
### **CODE:**

```
#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

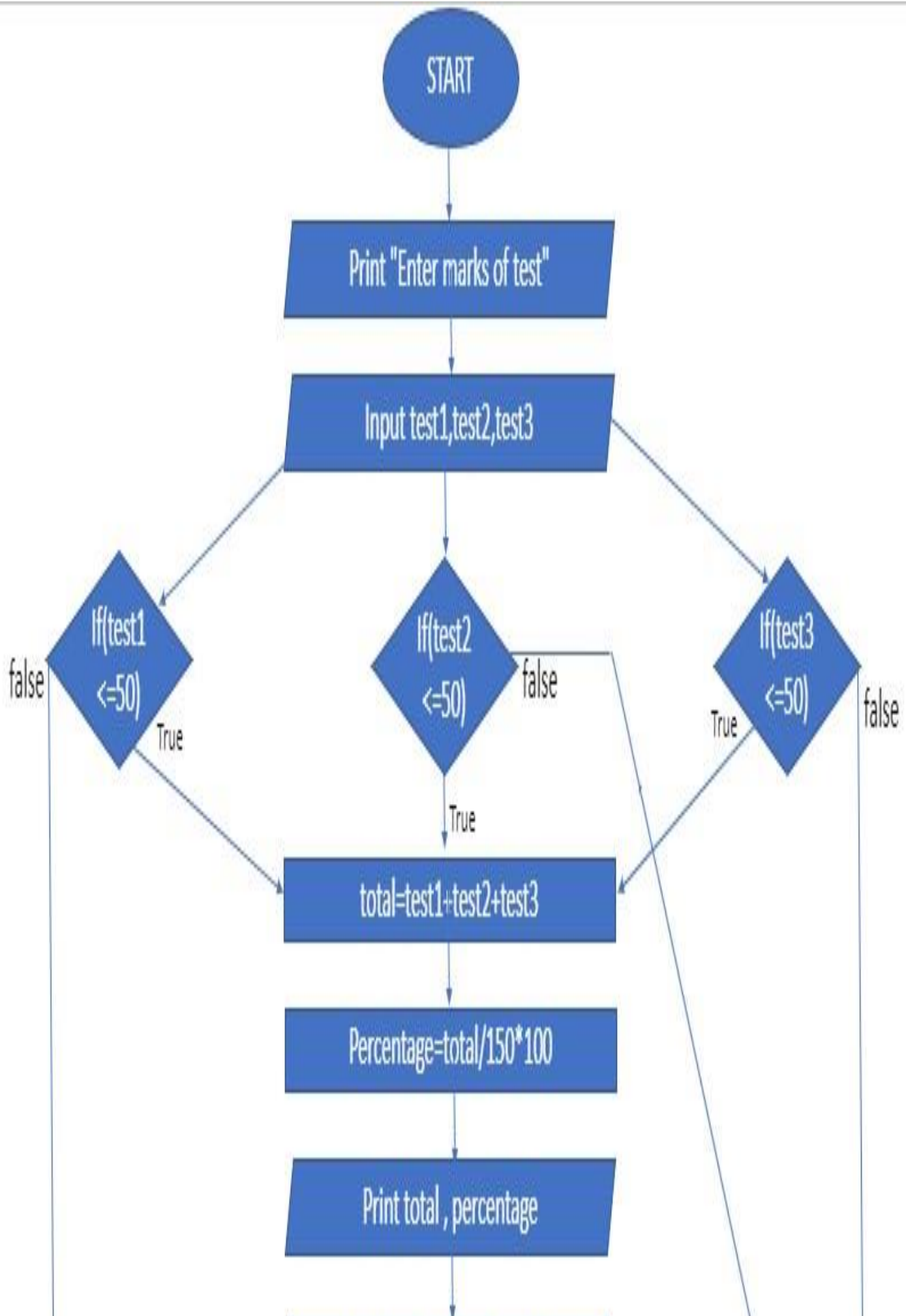
Mark of third test out of 50=44

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 -2.09409e+06

## **FLOWCHART:**



