## Experiment No: 27

## **Experiment Name:** Find Sin(x) using the following formula:

## **Objective:**

Briefly explain the purpose of the program.

State the mathematical background of using a Taylor series expansion to calculate the sine function.

Mention the input parameters (angle in degrees and accuracy) and their significance.

# **Code:**

#include <stdio.h>

#include <math.h>

#include <stdlib.h>

void main()

{

int n, x1;

float acc, term, den, x, sinx=0, sinval;

printf("Enter the value of x (in degrees)\n");

scanf("%f",&x);

x1 = x;

x = x\*(3.142/180.0);

sinval = sin(x);

printf("Enter the accuracy for the result\n");

scanf("%f", & acc);

term = x;

sinx = term;

n = 1;

do

{

den = 2\*n\*(2\*n+1);

term = -term \* x \* x / den;

sinx = sinx + term;

n = n + 1;

} while(acc <= fabs(sinval - sinx));

printf("Sum of the sine series = %f\n", sinx);

printf("Using Library function sin(%d) = %f\n", x1,sin(x)); }

# **Input:**

Enter the value of x (in degrees)

45

**Output:**

Enter the accuracy for the result

65

Sum of the sine series = 0.704723

Using Library function sin(45) = 0.707179

## **Discussion:**

* Summarise the key findings of the lab.
* Discuss the accuracy of the program and any limitations.
* Mention any improvements or further work that could be done.