Problem:

Evaluate the following integrals:

1. ***I*= ,By Trapezoidal rule**

**Code in C:**

#include<stdio.h>

#include<conio.h>

#include<math.h>

#define f(x) sqrt(sin(x))

void main()

{ float a,b;

float h,fa,fb,sum=0,Ict;

clrscr();

printf("Enter lower limit:");

scanf("%f",&a);

printf("\nEnter upper limit:");

scanf("%f",&b);

h=(b-a)/1;

fa=f(a);

fb=f(b);

sum=(fa+fb)/2;

Ict=sum\*h;

printf("\nThe integrated value is: %f",Ict);

getch();

}

Output:

**Enter lower limit:0**

**Enter upper limit:1.570796**

**The integrated value is: 0.785398**

1. *I=***,By Composite Trapezoidal rule,taking n=2 and n=3**

Code In C:

#include<stdio.h>

#include<conio.h>

#include<math.h>

#define f(x) sqrt(sin(x))

void main()

{

float a,b,ics,sum=0;

int i,n;

clrscr();

printf("Enter the no of intervals:");

scanf("%d",&n);

printf("Enter the lower limit: ");

scanf("%f",&a);

printf("Enter the upper limit: ");

scanf("%f",b);

h=(xn-x0)/n;

fa=f(a);

fb=f(b);

for(i=1;i<n;i++)

{

x[i]=x0+i\*h;

sum=sum+2\*f(x);

}

sum=sum+fa+fb;

ics=sum\*h/2;

printf("The value of integral is: ");

printf("%f",ics);

getch();

}

Output:

**Enter the no of intervals:2**

**Enter the lower limit: 0**

**Enter the upper limit: 1.5707963**

**The value of integral is: 1.053138**

**Enter the no of intervals:3**

**Enter the lower limit: 0**

**Enter the upper limit: 1.5707963**

**The value of integral is: 1.119303**

1. I=ex dx,By using Simpson’s 1/3 rule

Code in c:

#include<stdio.h>

#include<conio.h>

#include<math.h>

#define f(x) exp(x)

void main()

{ float a,b,fa,x,fb,f1,h,sum=0;

printf("Enter the lower limit: ");

scanf("%f",&a);

printf("Enter the upper limit: ");

scanf("%f",&b);

h=(b-a)/2;

fa=f(a);

fb=f(b);

x=a+h;

f1=f(x);

sum=h/3\*(fa+4\*f1+fb);

printf("\n The Integrated value is:%f",sum);

getch();

}

Output:

**Enter the lower limit: -1**

**Enter the upper limit: 1**

**The Integrated value is: 2.362054**

1. I=x2+ 1 dx ,By using composite Simpson’s 1/3 rule,taking n=4 and n=6