IFoS-2014 → Paper II

5) Write a program in BASIC to integrate, $\int_0^1 e^{-2x} \sin x\,dx$ by Simpson's $\frac{1}{3}$rd rule with 20 subintervals.

⇒
```
# include<stdio.h>
# include<conio.h>
# include<math.h>
Void main()
{
  float a,b,h,x,y,y0,yn,xn,so,se,s;
  int i,n;
  float f(float);
  clrscr();
  Printf("\n\n Enter the lower limit: ");
  Scanf("%f",&a)
  printf("\n\n Enter the upper limit: ");
  Scanf("%f",&b);
  Printf("\n\n Enter the interval: ");
  scanf("%d",&n);
  h=(b-a)/n;
  y0=f(a);
  yn=f(b);
  x=a+h;
  so=0;
  for(i=1;i<=(n-1);i=i+2)
```

```
{
 y= f(x) ;
 so= so+y;
  x = x +(2*h);
}
se=0;
x=a+2*h;
for (i=2 ; i<= (n-2) ; i=i+2)
{
   y=f(x);
   se= se+y;
    x=x+(2*h);
 }
 r=(h/3) * (y0+yn +(4*so) +(2*se)) ;
 printf ("\n\n The result is: %f", r);
 getch();
}
float f(float x)
{
return (exp(-2*x) * sin(x));
}
```

6)(d) write a BASIC program to sum the series, $S = 1+x+x^2+ \cdots +x^n$, for $n=30,60$ and 90 for the values of $x = 0.1\ (0.1)\ 0.3$.

=>
```
# include <math.h>
# include <stdio.h>
# include <conio.h>
void main()
{
  float sum,x;
  int i,n;
```

```
printf("\n Type x,n \n");
scanf("%f,%d",&x,&n);
i=0;
sum = 1;
S10: i++;
sum+ = pow(x,i);
if (i<n)
goto S10;
printf("sum = %f", sum);
}
```