Scilab Practical-1 Laplace Transform

Sample Question

**Ques**: .Draw the surface plot of Laplace Transform of following function keeping s=σ+j ω

**Code:**

clear; clc;

t=0:0.01:5; // function is defined in this range//

f=sin((4\*t)+3);

a=1; //variable chosen to define the loop for sigma //

for sigma=-0.5:0.01:0.5, //range for sigma is required to plot the graph, //

b=1; //variable chosen to define the loop for omega //

for omega =-0.5:0.01:0.5,

rp=f.\*exp(-sigma\*t).\*cos(omega\*t); //real part of integrand //

irp(a,b)=inttrap(t,rp); //command to find integration of real part of integrand using trapezoidal rule//

ip=f.\*exp(-sigma\*t).\*sin(omega\*t); //imaginary part of integrand//

iip(a,b)=inttrap (t,ip); //command to find integration of imaginary part of integrand using trapezoidal rule//

magnitude (a,b)=abs(irp(a,b)+%i\*iip(a,b)); //evaluation of integral including real and imaginary part//

b=b+1; end;

a=a+1; end;

sigma=-0.5:0.01:0.5;

omega=-0.5:0.01:0.5;

plot3d(sigma,omega,magnitude) // plot3d is to be used to plot 3 variables

title('ABC123456','fontsize',5)

**Instructions**

**Make a word file in the following manner and upload the file in LMS Assignment.**

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| --- | --- | --- |
| Steps | Details | Marks (25) |
| 1 (on the top of page) | Name  Batch & Roll no  Tutorial Name and date: T1- scilabpractical1 L.T. | 1 |
| 2 | File name :P1-RollNo-Batch no\_Name  Eg.P1-16010421001-A1- TANUSHREE ACHARYA | 1 |
| 3 | Question1  Code  Output | 1  3  3 |
| 4 | Question2  Code  Output | 1  3  3 |
| 5 | Question3  Code  Output | 1  3  3 |
| 6 | Upload the file during practical period on LMS | 2 |

**Name**

**Batch and Roll no**

**Ques 1** Draw the surface plot of Laplace Transfrom of following function keeping s=σ+j ω

Code on Scinotes :

clear; clc;

t=0:0.01:5; *// function is defined in this range//*

f=sin((4\*t)+3);

a=1; *//variable chosen to define the loop for sigma //*

for sigma=-0.5:0.01:0.5, *//range for sigma is required to plot the graph, //*

b=1; *//variable chosen to define the loop for omega //*

for omega =-0.5:0.01:0.5,

rp=f.\*exp(-sigma\*t).\*cos(omega\*t); *//real part of integrand e^(-st) f(t)=e^(-(σ+j ω)t) f(t)//*

irp(a,b)=inttrap(t,rp); *//command to find integration of real part of integrand using trapezoidal rule//*

ip=f.\*exp(-sigma\*t).\*sin(omega\*t); *//imaginary part of integrand//*

iip(a,b)=inttrap (t,ip); *//command to find integration of imaginary part of integrand using trapezoidal rule//*

magnitude (a,b)=abs(irp(a,b)+%i\*iip(a,b)); *//evaluation of integral including real and imaginary part//*

b=b+1; end;

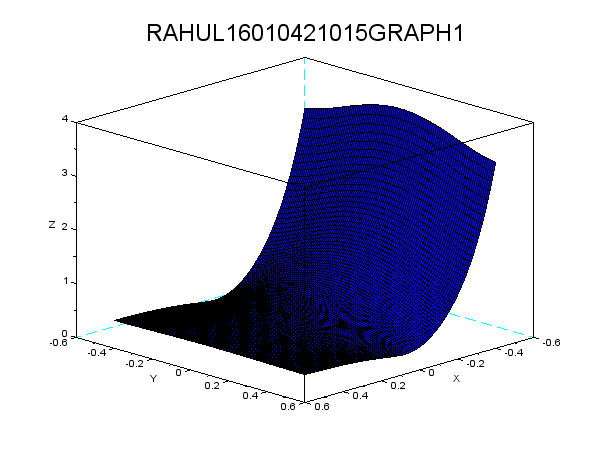
a=a+1; end;

sigma=-0.5:0.01:0.5;

omega=-0.5:0.01:0.5;

plot3d(sigma,omega,magnitude) *// plot3d is to be used to plot 3 variables*

title('ABC123456GRAPH1','fontsize',5)

**Output:** ****

**Note: to paste the graph, click on copy to clipboard in file in graphic window and give the command paste here.**

Q.2 .Draw the surface plot of Laplace Transform of following functions keeping s as real

Code on Scinotes :

clear; clc;

t=0:0.01:5; *// function is defined in this range//*

f=exp(4\*t);

a=1; *//variable chosen to define the loop for sigma //*

for sigma=-0.5:0.01:0.5, *//range for sigma is required to plot the graph, //*

rp=f.\*exp(-sigma\*t); *//real part of integrand e^(-st) f(t)=e^(-(σ+j ω)t) f(t)//*

irp(a)=inttrap(t,rp); *//command to find integration of real part of integrand using trapezoidal rule//*

magnitude(a)=abs(irp(a)); *//evaluation of integral including real and imaginary part//*

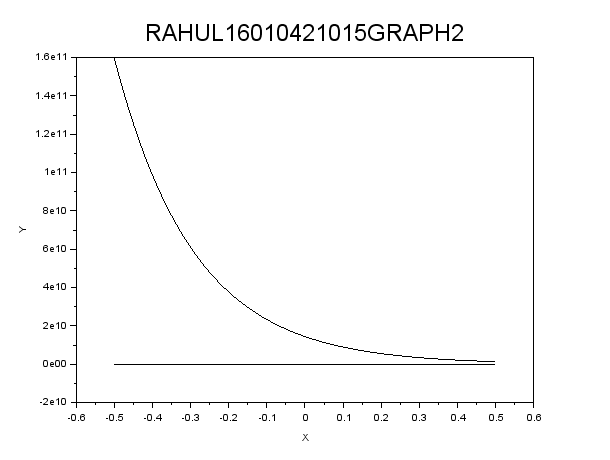
a=a+1; end;

sigma=-0.5:0.01:0.5;

plot2d(sigma,magnitude) *// plot2d is to be used to plot 3 variables*

title('XYZ123456GRAPH2','fontsize',5)

**Output:**

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Q.3 Draw the surface plot of Laplace Transform of following functions keeping s imaginary

Code on Scinotes :

clear; clc;

t=0:0.01:5; *// function is defined in this range//*

f=(exp(3\*t)\*cos(4\*t))

b=1; *//variable chosen to define the loop for omega //*

for omega =-0.5:0.01:0.5,

rp=f.\*cos(omega\*t); *//real part of integrand e^(-st) f(t)=e^(-(σ+j ω)t) f(t)//*

irp(b)=inttrap(t,rp); *//command to find integration of real part of integrand using trapezoidal rule//*

ip=f.\*sin(omega\*t); *//imaginary part of integrand//*

iip(b)=inttrap (t,ip); *//command to find integration of imaginary part of integrand using trapezoidal rule//*

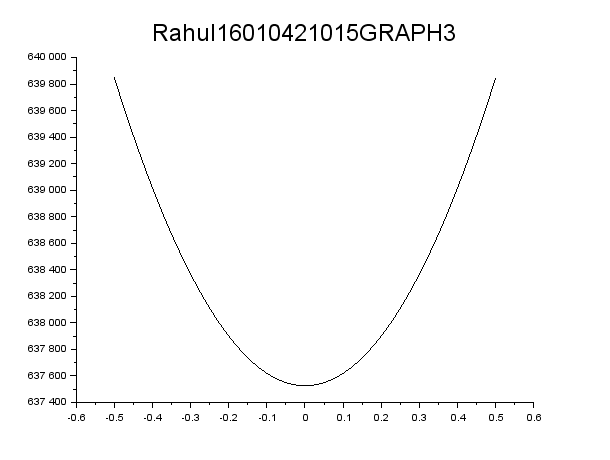
magnitude (b)=abs(irp(b)+%i\*iip(b)); *//evaluation of integral including real and imaginary part//*

b=b+1; end;

omega=-0.5:0.01:0.5;

plot2d(omega,magnitude) *// plot3d is to be used to plot 3 variables*

title('ABC123456GRAPH3','fontsize',5)

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