Hyder Presswala

B-2

16010122151

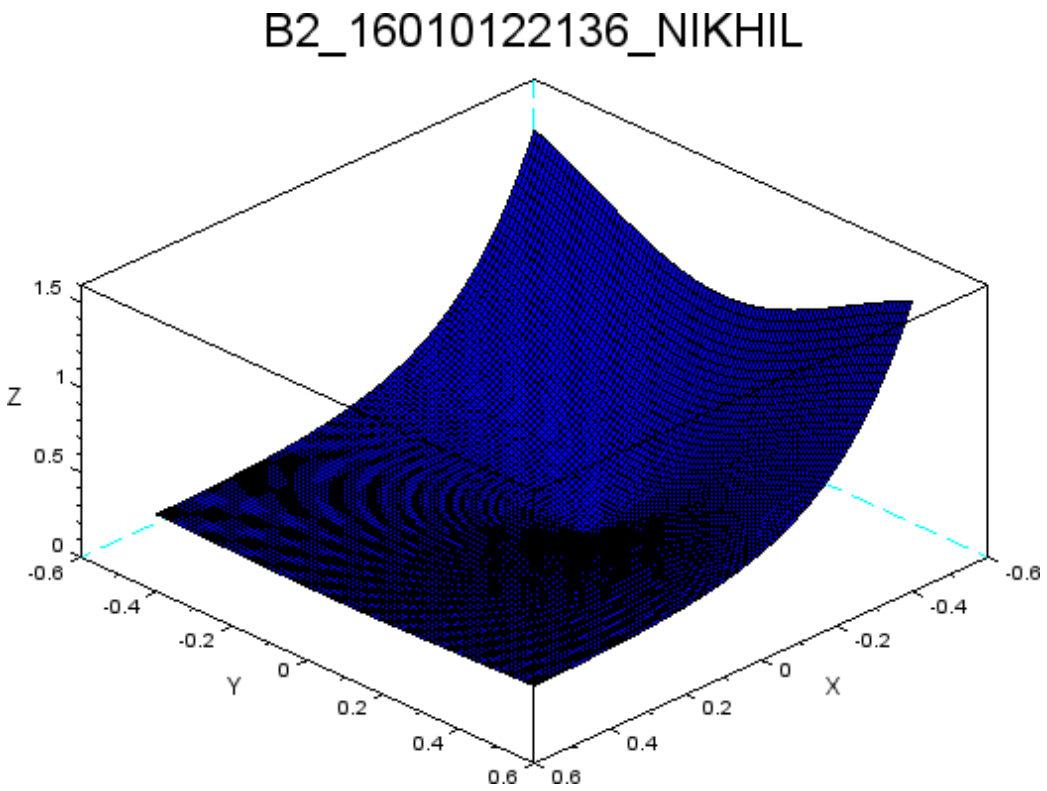
Q1.

Draw the surface plot of Laplace Transfrom 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 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('B2_16010122136_NIKHIL','fontsize',5)
```

OUTPUT:

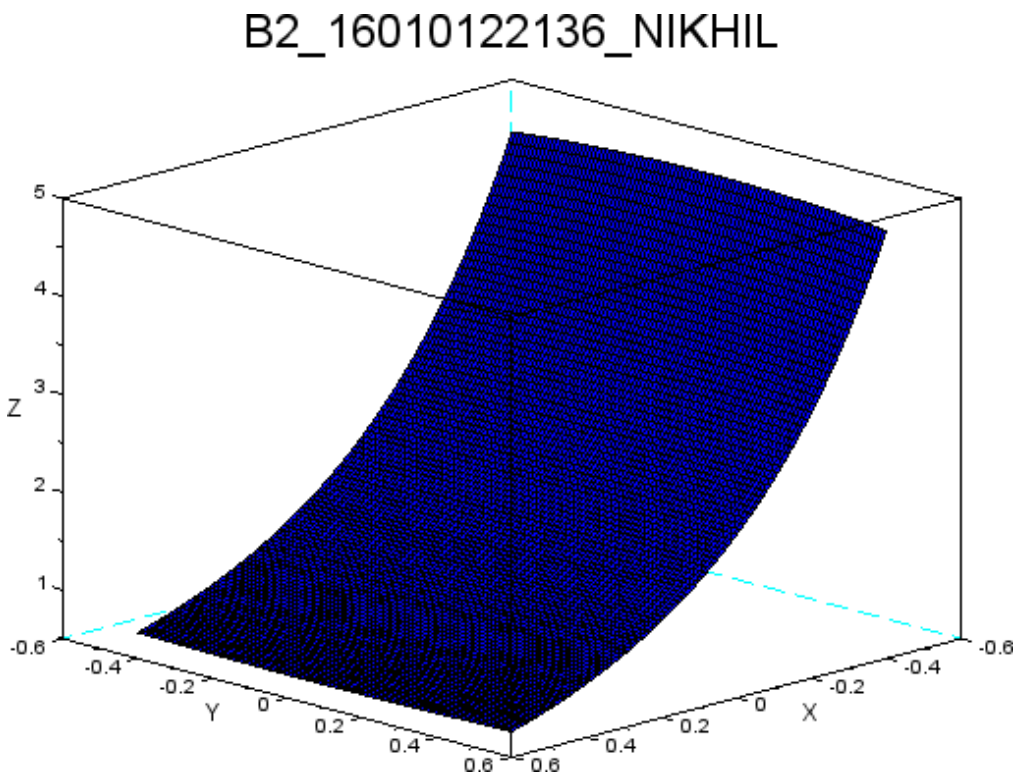


Q2 : Draw the surface plot of Laplace Transfrom of following function keeping s=σ+j ω:

CODE:

```
clear; clc;
t=0:0.01:3; // function is defined in this range//
f=cos((t-2)+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('B2_16010122136_NIKHIL','fontsize',5)
```

OUTPUT:



Q3: Draw the surface plot of Laplace Transfrom of following function keeping s=σ+j ω:

CODE:

```
clear; clc;
t=0:0.01:%pi; // function is defined in this range//
f=(sin(t-%pi)^2);
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('B2_16010122136_NIKHIL','fontsize',5)
```

OUTPUT: