Practical 1

A = [1 0 0 1 -1 ;

0 2 3 5 0;

-1 0 0 0 1;

6 8 1 2 -2;

1 1 1 1 1];

arr = eig(A);

sortedArr = sort(abs(arr));

disp(sortedArr(1));

disp(sortedArr(2));

Output:

Assignment\_1

0.4611

1.4643

Practical 2

To show the consistency and inconsistency of equations

Script File

A = input('Enter Matrix A : \n');

B = input('Enter Matrix B : \n');

Aug = [A B];

if(rank(A) == rank(B))

disp('The equation is consistent');

else

disp('The system of Equations is inconsistent');

end

Output:

Practical\_2

Enter Matrix A :

[1 0 ; 0 1]

Enter Matrix B :

[0 ; 0]

The system of Equations is inconsistent

Practical 3

To solve system of equations if consistent

Script:

A = input('Enter Matrix A : \n');

B = input('Enter Matrix B : \n');

Aug = [A B];

if(rank(A) == rank(Aug))

Ans = linsolve(A, B);

disp(Ans(1))

disp(Ans(2))

disp(Ans(3))

else

disp('The Equation is inconsistent')

end

Output:

Assignment\_2

Enter Matrix A :

[1 2 1 ;

2 3 5 ;

7 1 2]

Enter Matrix B :

[5 ; 7 ; 0 ]

-0.3636

2.7273

-0.0909

Practical 4:

Write a program to solve the following equations using ode23 and ode45 functions, and hence compare the values of y(3)

Dy/dx = y + x y(0) = 1

Script file:

function val = differentialEquation(y,t)

val = y + t;

on command window:-

[x, y1] = ode23('differentialEquation', [-5 5], 1);

>> plot(x, y1);

>> ans = y1(3)

ans =

0.4975

[x, y2] = ode45('differentialEquation', [-5 5], 1);

>> plot(x, y2)

ans = y2(3)

ans =

0.8986

Program 5:

Write a code to solve differential D2y + 4y = secx using method of variation of parameters

Script file:

syms t

g(t) = sec(t);

Yc = dsolve('D2y + 4\*y = 0');

y1 = cos(2\*t);

y2 = sin(2\*t);

uDot = diff(y1);

vDot = diff(y2);

w = [y1 y2 ; uDot vDot];

W = det(w);

w1 = [0 y2 ; g vDot];

W1 = det(w1);

w2 = [y1 0 ; uDot g];

W2 = det(w2);

uDot = W1 / W;

vDot = W2 / W;

u = int(uDot);

v = int(vDot);

Yp = u\*y1 + v\*y2;

Y(t) = Yc + Yp;

Output:

Practical\_5

>> Y(t)

ans =

cos(2\*t)\*cos(t) + C3\*cos(2\*t) + C4\*sin(2\*t) - sin(2\*t)\*(atanh(sin(t))/2 - sin(t))

Practical 6

Graphically compare the function sin(x) and it’s taylor series expansion upto degree of 10 in the neighbourhood of 1.

Script file: