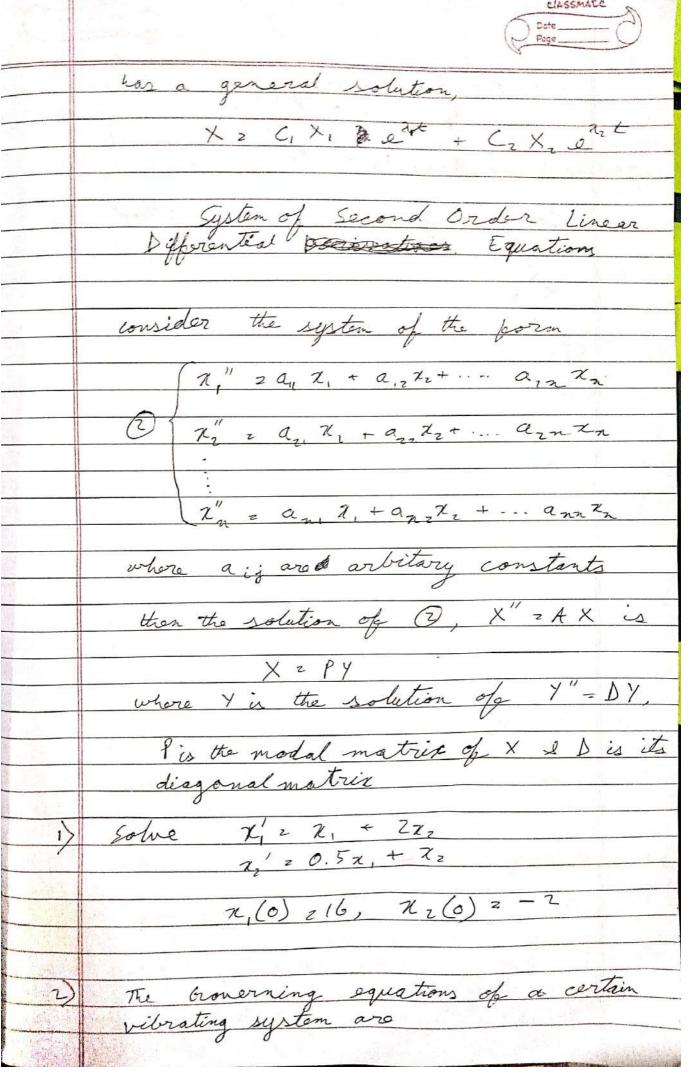
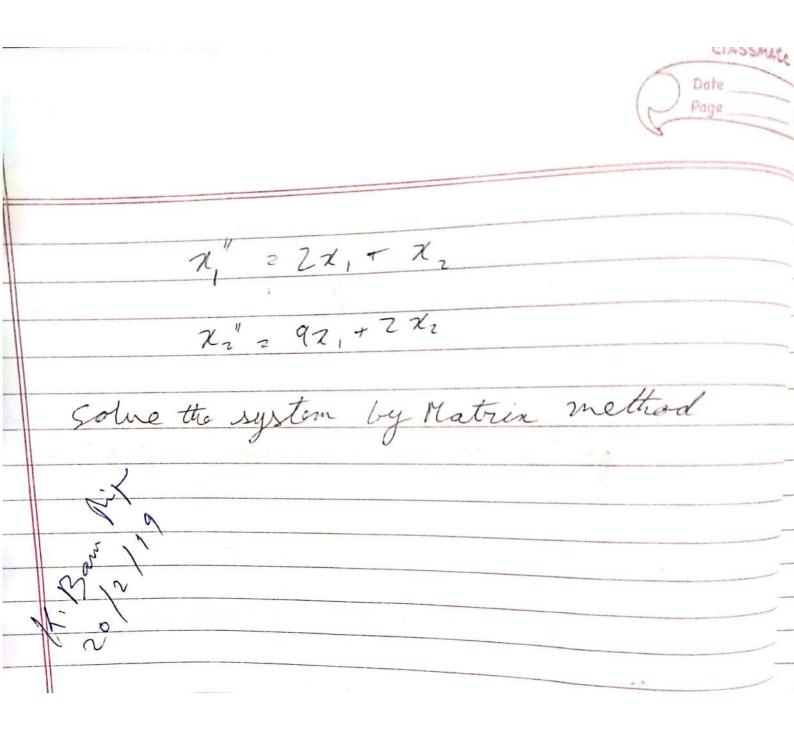
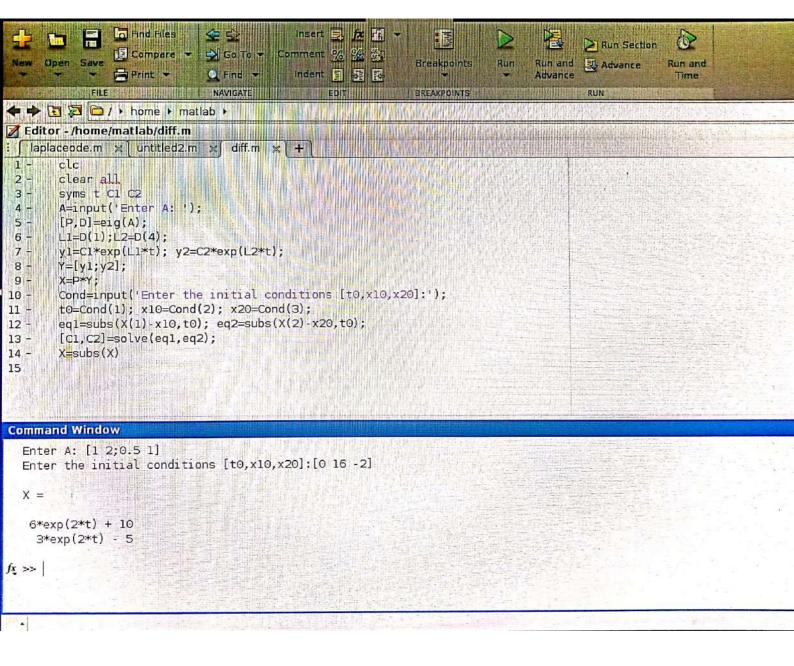
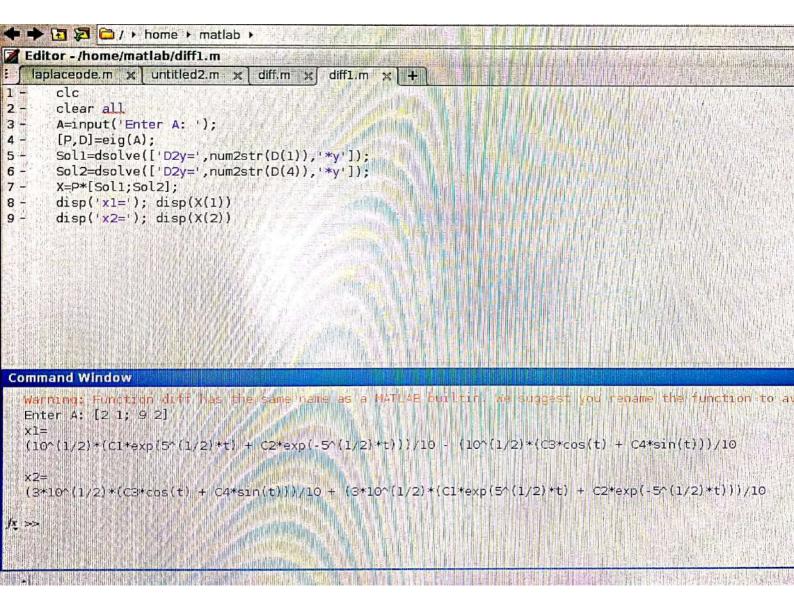
Date Page
EXPERIMENT Z
System of First order Linear Differential Equation
A system of n linear first order differential equations in n unknowns (nxn system of linear equations) has the general form:
$ \begin{pmatrix} \chi'_{1} = \alpha_{1} \chi_{1} + \alpha_{12} \chi_{2} + \alpha_{n} \chi_{n} + g_{1}(t) \\ \chi'_{1} = \alpha_{21} \chi_{1} + q_{22} \chi_{2} + \alpha_{2n} \chi_{n} + g_{1}(t) $ $ \vdots $
Where a gare arbitary companies of t. Eg? are homogeneous if all
Dis often written in shorthand or $X' = A \times G$
Where X' ? [Ri]nx, A = [aij]nx* X ? [Ri]nx, & Gr ? [gi(L)]nx
(distinct) 2, 822, I their respective sigen water X'2 AX can be written

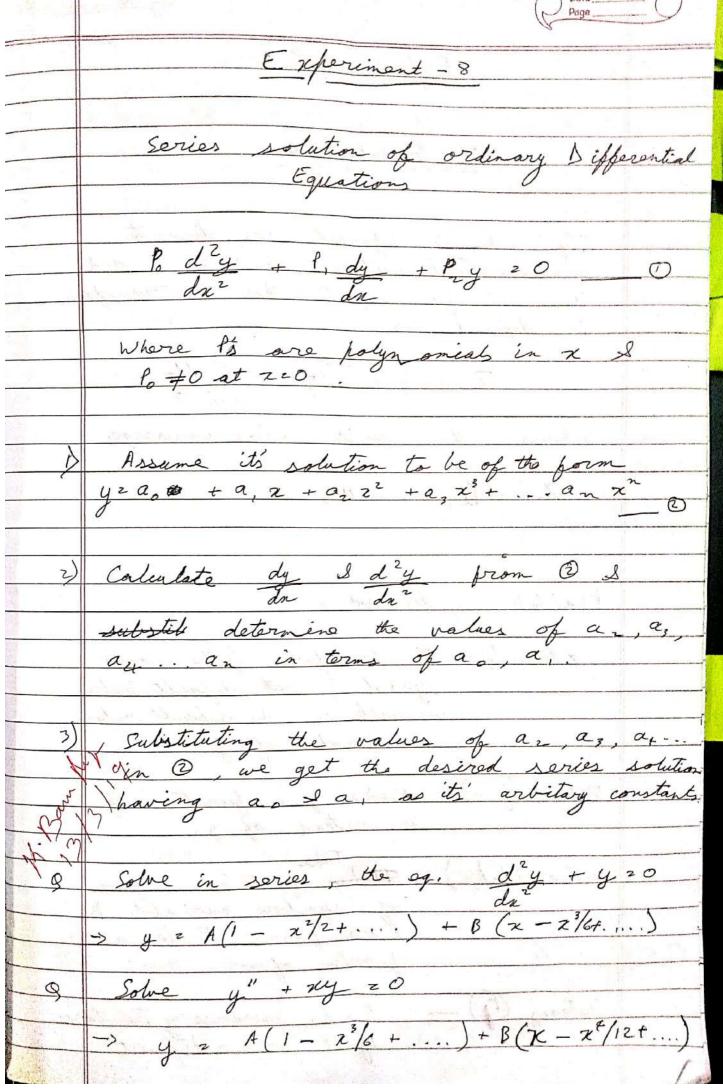
CIMSSMATE











```
Editor - /home/matlab/sode.m
  sode.m 🗶 🗀 🛨 🗎
 1 -
2 -
3 -
        clc
        clear
        syms x a0 a1 a2 a3
        a = [a0 \ a1 \ a2 \ a3];
        y = sum(a.*(x).^[0:3]);
 5
        dy = diff(y);
 7
        d2y = diff(dy);
8
        gde = collect(d2y+y,x);
 9
        cof=coeffs(gde,x);
10
        A2=solve(cof(1),a2);
11
        A3=solve(cof(2),a3);
12
        y=subs(y,{a2,a3},{A2,A3});
13
        y=coeffs(y,[a1 a0]);
14
        disp('Solution is')
        disp(['y=A(',char(y(1)),'+
15
Command Window
  Solution is
                     ..)+B(x
  y=A(1 -
                                x^3/6+
fx >>
```

```
sode.m × +
 1 -
        clc
 2 -
        clear
 3 -
        syms x a0 a1 a2 a3 a4
        a = [a0 \ a1 \ a2 \ a3 \ a4];
 4 -
        y = sum(a.*(x).^[0:4]);
 5 -
        dy = diff(y);
 6 -
        d2y = diff(dy);
 7 -
        gde = collect(d2y+y*x,x);
 8 -
        cof=coeffs(gde,x);
 9 -
        A2=solve(cof(1),a2);
10 -
        A3=solve(cof(2),a3);
11 -
        A4=solve(cof(3),a4);
12 -
        y=subs(y,{a2,a3,a4},{A2,A3,A4});
13 -
                                                              I
        y=coeffs(y,[a1,a0]);
14 -
        disp('Solution is')
15 -
Command Window
  Solution is
  y=A(1 - x^3/6 + ...) + B(x - x^4/12 + ...)
fx >>
```