Class Test - 1

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Q1) i) (d) None

ii) (a) xlabel()

iii) (b) Matrix Laboratory

iv) ~~(a) (b) (c)~~ (d) clear all

v) (b) \n

Q2) Program For Linear Fit for given data?

```
% Fitting a linear curve using polyfit

clc;
clear;
close all;

% Creating The discrete data
X = [-10 : 20]
y = X .^ 2;

% Using The polyfit function to fit a Linear
% curve to the data

[theta, _] = polyfit(X, y, 1);

% Creating a Linear Function Using Points
% Obtained
Syms f(t);
~~f(t) = theta(1) * t + theta(2);~~
f(t) = theta(1) * t + theta(2);
```

```
% Plotting the Function
p1 = fplot(f);
title("Linear Curve Fitted To Data");
xlabel("x");
ylabel("Fitted Curve ; y'(x)");

% Plotting The Original Discrete data
hold on;
p2 = plot(X,Y,'-o');
legend([p1, p2], 'Fitted Curve', 'OriginalData');
```

Q3) Write a program for ODE?

```
% Solving the Non-linear ODE for Hookes's Law

clc;
clear;
close all;

% Creating the function
syms x(t);

% Declaring the mass and spring constant
m = 1/16;
K = 4;

% Declaring the second order non-linear ODE
```

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```
Dy = diff(x);
ode = m * diff(x, t, 2) + k * x == 0;

% Providing initial value conditions
condition1 = x(0) == 0;
condition2 = Dy(0) == 1;

% We solve the equation and add the initial
% value condition.
x(t) = dsolve(ode, [condition1, condition2]);


% We plot the obtained Function
fplot(x);
title("Object attached at End of Spring ..
        Obeying Hooke's Law");
xlabel("Time: t");
ylabel("Position of Object: " + string(x));
legend;
```