Q1) i) (d) None

ii) (a) xlabel()

iii) (b) Matrix Laboratory

iv) ~~xlabel~~ (b) clear

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);
```

```
% Plotting the Function
pl = 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', 'Original D
                                        ata');
```

Q3) Write a program for ODE ?

```
% Solving the Non-linear ODE for Hooke'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
```

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

% Providing initial value conditions
```
condition 1 = x(0) == 0;
condition 2 = Dy(0) == 1;
```

% We solve the equation and add the initial
% value condition.
```
x(t) = dsolve(ode, [condition 1, condition 2]);
```

% 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;
```