QUESTION 4

A

```
Commandwindow
Clear
Clc
Close all
Syms y(t)
T1=diff(y,t,1)
T2=diff(y,t,2)
G=[T2 + (5*T1) +(6*y)==cos*t]
dy=diff(y,t)
Gcond=[y(o)==5,dy(0)==3]
Solution=dsolve(G,Gcond)
Pretty(solution)
tn = [0:0.1:50]
z = subs(solution,tn)
figure(1
plot(tn,z)
xlabel('time(min)')
ylabel('vibrations')
grid on
grid minor
axis tight
```

B

```
commandwindow
clear
clc
syms X Y t
X = ('Dx + 3*y = exp(-2*t)')
Y = ('Dy + 3*x = exp(2*t)')
X_initial=('X(0)=30')
Y_initial=('Y(0)=30')
[x,y] = dsolve(X,Y,X_initial,Y_initial)
V = [0:0.1:5]
Xn = subs(X,V)
Yn=subs(Y,V)
plot(V,Xn,V,Yn)
```

C(continued line of command from B)

```
syms L(t) R(t) I(t) E
Elizabeth=[diff(I,t)*L + R*I==E]
Izokpucond=[I(0)==0]
Solution=dsolve(Elizabeth,Izokpucond)
```

D(continued line of command from c)

t is equal to π

```
syms k t w a
f=const*exp(-a*t)*cos(w*t)
fs=laplace(const*exp(-a*t)*cos(w*t))
```

E

```
syms pi s
F=(pi/(s^2 + 10*pi*s + 24*(pi^2)))
Ft=ilaplace(F)
Pretty(Ft)
```