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**MATRIC NUMBER: 17/ENG01/024**

**DEPARTMENT: CHEMICAL ENGINEERING**

**Assignment 4**

A)

commandwindow

clear

clc

syms n(t)

ray= diff(n,t,2) - diff(n,t) - 12\*n== 144\*t^3 + 12.5

dray= diff(n,t)

nnamdi=[n(0)==5, dray(0)==-0.5]

opara= dsolve(ray,nnamdi)

pretty(opara)

tn=[0:0.1:1.5]

rayn= subs(opara,tn)

plot(tn,rayn)

axis tight

grid on

grid minor

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**B)**

**i) Plotting the graph seperately**

**commandwindow**

**clear**

**clc**

**syms y(t) x(t)**

**ode=diff(y,t)-2\*x==exp(-2\*t)**

**ode1=diff(x,t)+y==exp(-t)**

**ola2=[ola,ola1]**

**cond=[y(0)==0,x(0)==0]**

**[yeq xeq]=dsolve(ola2,cond)**

**figure(1)**

**fplot (yeq)**

**grid on**

**grid minor**

**figure(2)**

**fplot (xeq)**

**grid on**

**grid minor**

**Figure 1(yeq)**

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**Figure 2 (xeq)**

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**ii) Plotting the graph together**

**commandwindow**

**clear**

**clc**

**syms y(t) x(t)**

**ola=diff(y,t)-2\*x==exp(-2\*t)**

**ola2=diff(x,t)+y==exp(-t)**

**ola3=[ola,ola2]**

**cond=[y(0)==0,x(0)==0]**

**[yeq xeq]=dsolve(ola3,cond)**

**fplot (yeq)**

**hold on**

**fplot (xeq)**

**grid on**

**grid minor**

****

**C)**

**i) commandwindow**

 **clear**

 **clc**

 **syms t k a w**

 **ft= k\*exp(-a\*t)\*sin(5\*w\*t)\*cos(3\*w\*t)**

 **fs=laplace(ft)**

ii) commandwindow

clear

clc

syms s

fs= pi/(s^2+15\*pi\*s+24\*pi^3)

ft= ilaplace (fs)