**OWOLABI OLUWATOMISIN PEACE**

**ELECTRICAL/ELECTRONICS ENGINEERING**

**16/ENG04/047**

**ENG 381**

**QUESTION 1**

commandwindow

clear all

clc

syms (t y)

E=dsolve('D2y+5\*Dy+6\*y=cos(t)','y(0)=5','Dy(0)=3')

pretty (E)

T=[0:0.1:50]

yn=subs(E,T)

plot(E,yn)

grid on

grid minor

axis tight

xlabel('time')

ylabel('response of the system')

figure(1)



QUESTION 2

commandwindow

clear all

clc

syms (T1 T2 t)

E1=('DT1+3\*T2=exp(-2\*t)')

E2=('DT2-3\*T1=exp(2\*t)')

T1\_initial=('T1(0)=30')

T2\_initial=('T2(0)=30')

[T1,T2]=dsolve(E1,E2,T1\_initial,T2\_initial)

K=[0:0.1:5]

T1n=subs(T1,K)

T2n=subs(T2,K)

plot(K,T1n,K,T2n)

ylabel=('Temperature')

xlabel=('Time')

grid on

grid minor

axis tight

legend ('T1','T2')

figure(2)



**QUESTION3**

commandwindow

clear all

clc

syms (L I R E)

y=dsolve('L\*DI+R\*I=E','I(0)=0')

pretty(y)

y =

(exp(1) - exp(-(R\*t)/L)\*exp(1))/R

/ R t \

E - exp| - --- | E

\ L /

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R

**QUESTION 4**

commandwindow

clear all

clc

syms (k a t w)

y=k\*exp(-a\*t)\*cos(w\*t)

laplace(y)

pretty(y)

y =

k\*exp(-a\*t)\*cos(t\*w)

ans =

(k\*(a + s))/((a + s)^2 + w^2)

k exp(-a t) cos(t w)

**QUESTION5**

commandwindow

clear all

clc

syms s

y=pi/(s^2+(10\*pi\*s)+(24\*(pi^2)))

ilaplace(y)

pretty(y)

y =

pi/(s^2 + 10\*pi\*s + 8334140006820045/35184372088832)

ans =

(pi\*sinh(t\*(25\*pi^2 - 8334140006820045/35184372088832)^(1/2))\*exp(-5\*pi\*t))/(25\*pi^2 - 8334140006820045/35184372088832)^(1/2)

pi

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2 8334140006820045

s + 10 pi s + ----------------

35184372088832