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16/ENG04/005

ELECTRICAL/ELECTRONICS ENGINEERING

ENG 281 MID-SEMESTER TEST

a.)

(code)

```
commandwindow
clear
clc
A=[0 10 4 -2;-3 -17 1 2;1 1 1 0;8 -34 16 -10]
B=[-4;2;6;4]
x=[A^-1]*B
```

(output)

A =

0 10 4 -2

-3 -17 1 2

1 1 1 0

8 -34 16 -10

B =

-4

2

6

4

x =

4.0000

-0.0000

2.0000

6.0000

b.)

(code)

Commandwindow

```
clear

clc
syms t
d=1.5*exp(-0.75*t)*sin(0.85*t)+(0.375*t)
tn=(0.01:2.5)
dn=subs(d,tn)
figure (1)
plot (tn,dn)
xlabel ('time(hr)')
ylabel ('distance(m)')
axis tight
grid on
grid minor

v= diff(d)
vn= subs(v,tn)
figure (2)
plot (tn,vn)
xlabel ('time(hr)')
ylabel ('velocity(m/min)')
axis tight
grid on
grid minor

a=diff(v)
an= subs(a,tn)
figure (3)
plot (tn,an)
xlabel ('time(hr)')
ylabel ('acceleration(m/min^2)')
axis tight
grid on
grid minor

figure (4)
plot(tn,dn,tn,vn,tn,an)
ylabel ('variable')
xlabel ('time')
legend ('distance(m)''velocity(m/min)''acceleration(m/min^2)')
```

(output)

d =(3*t)/8 + (3*sin((17*t)/20)*exp(-(3*t)/4))/2

tn =0.0100 1.0100 2.0100

dn =[(3*exp(-3/400)*sin(17/2000))/2 + 3/800, (3*exp(-303/400)*sin(1717/2000))/2 + 303/800, (3*exp(-603/400)*sin(3417/2000))/2 + 603/800]

v =(51*cos((17*t)/20)*exp(-(3*t)/4))/40 - (9*sin((17*t)/20)*exp(-(3*t)/4))/8 + 3/8

vn =[(51*cos(17/2000)*exp(-3/400))/40 - (9*exp(-3/400)*sin(17/2000))/8 + 3/8, (51*cos(1717/2000)*exp(-303/400))/40 - (9*exp(-303/400)*sin(1717/2000))/8 + 3/8, (51*cos(3417/2000)*exp(-603/400))/40 - (9*exp(-603/400)*sin(3417/2000))/8 + 3/8]

a =- (153*cos((17*t)/20)*exp(-(3*t)/4))/80 - (6*sin((17*t)/20)*exp(-(3*t)/4))/25

an =[- (153*cos(17/2000)*exp(-3/400))/80 - (6*exp(-3/400)*sin(17/2000))/25, - (153*cos(1717/2000)*exp(-303/400))/80 - (6*exp(-303/400)*sin(1717/2000))/25, - (153*cos(3417/2000)*exp(-603/400))/80 - (6*exp(-603/400)*sin(3417/2000))/25]

>>

c.)

(code)

```
commandwindow
clear
clc
syms x
y=5*sin(5*x)^5
z=pi*(y^2)
zintd=int(z,0,pi)
zintd=double(zintd)
```

(output)

y =5*sin(5*x)^5

z =25*pi*sin(5*x)^10

zintd =(1575*pi^2)/256

zintd = 60.7212

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