MAC-ETELI GOLDEN

MECHATRONICS

16/ENG05/021

TEST ANSWER

QUESTION 4

A

```
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];
C   = inv(A);
D   = C * B
```

```
D =

    4.0000
   -0.0000
    2.0000
    6.0000

fx >>
```

B

```
commandwindow
```

```
clear
clc
close all
syms t
 d = 1.5 * exp(-0.75* t) * sin(0.85* t)+0.375 * t;
 tn =[0:0.01:2.5];
 v = diff(d);
 vn = subs(v,tn);
 figure(1)
plot(tn,vn)
xlabel("time(minutes)")
ylabel("velocity")
title("velocity against time graph")
grid on
grid minor

 a = diff(v);
 an = subs(a,tn);
 figure(2)
plot(tn,an)
xlabel("time(minutes)")
ylabel("acceleration")
title("acceleration against time graph")
grid on
grid minor


figure(3)
plot(tn,an,tn,vn)
xlabel("time(minutes)")
ylabel("velocity/acceleration")
title("velocity/acceleration against time graph")
grid on
grid minor
```

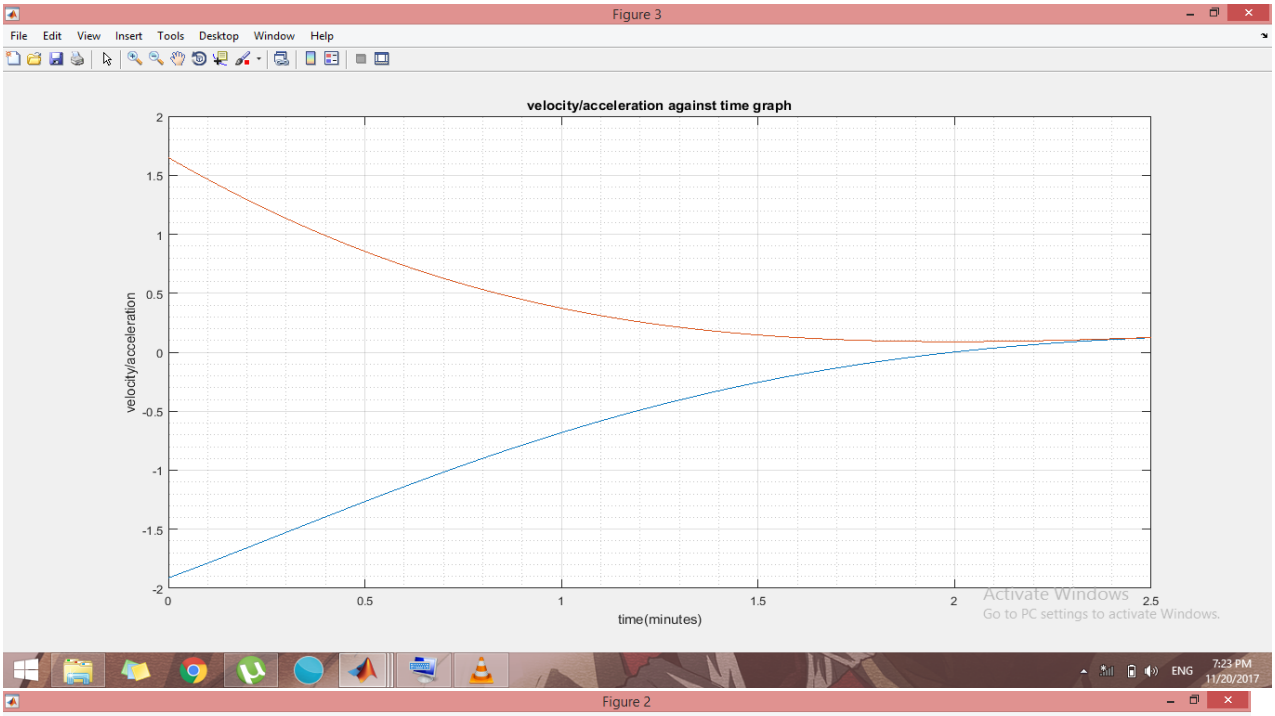
Figure 3
File Edit View Insert Tools Desktop Window Help
velocity/acceleration against time graph
velocity/acceleration
time(minutes)
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
0
0.5
1
1.5
2
2.5
Activate Windows
Go to PC settings to activate Windows.
ENG
7:23 PM
11/20/2017

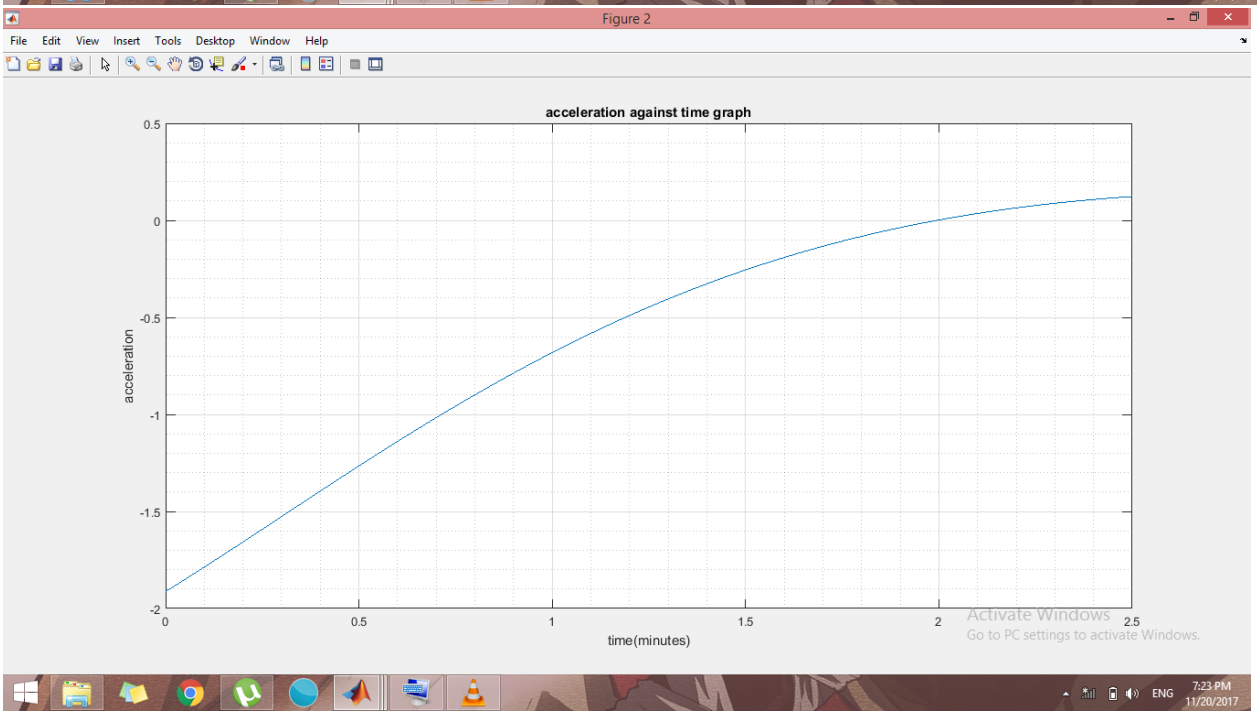
Figure 2
File Edit View Insert Tools Desktop Window Help
acceleration against time graph
acceleration
time(minutes)
0.5
0
-0.5
-1
-1.5
-2
0
0.5
1
1.5
2
2.5
Activate Windows
Go to PC settings to activate Windows.
ENG
7:23 PM
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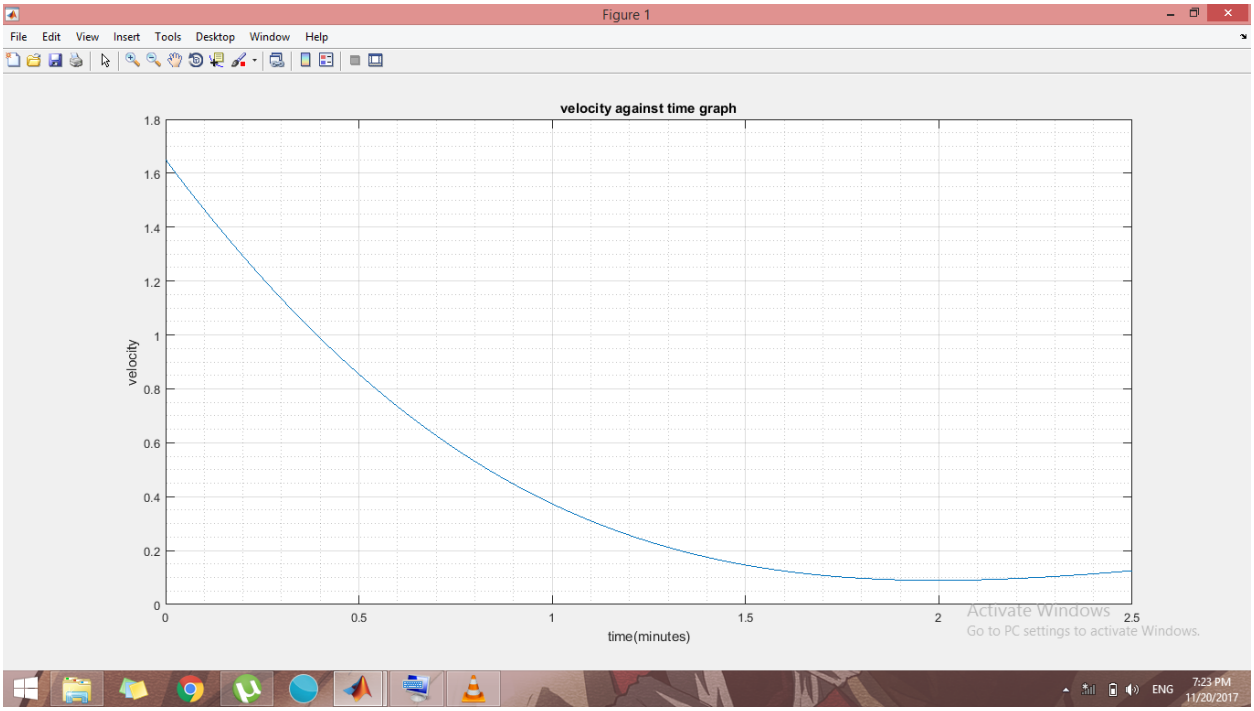
Figure 1
File Edit View Insert Tools Desktop Window Help
velocity against time graph
velocity
time(minutes)
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
0.5
1.5
2
2.5
Activate Windows
Go to PC settings to activate Windows.
ENG
7:23 PM
11/20/2017