Taiwo oladipupo olawale

18/eng02/090

Computer engineering

Engineering maths assignement

1.)

i)X=amount of salt

$R_{(in)}$=rate of flow of brine in tank

$R_{(out)}$=rate of flow of brine out the tank

$C_{(in)}$=concentration of salt in the flowing mixture

$C_{(out)}$=concentration of salt in the outflowing mixture

$R_{(in)}$ =50 gallons

$R_{(out)}$ =30 gallons

$C_{(in)}$ =(1+sint)ib=(8.35+8.35sint)

$\Delta x=salt_{in}-salt_{out}$

$=(c_{in*}r_{in}-c_{out*}r_{out})$

dx/dt=(8.35+8.35sint)*(50)-(30)*(c_{out})Δt

$c_{out}=x_{(t)}/v_{(t)}$

initial=150ib*8.35=1252.5

$v_{(t)}$=1252.5+t

dx/dt=(8.35+8.35sint)*(50)-(30x)/(1252.5+t)

a)dy/dt=51ib/min-2.5%of y ib/min

b)dy/dt=51-0.025

dy/dt=-0.025y+51

dy/dt=-0.025((-0.025y/-0.025y)+(51/-0.025)

dy/dt=-0.02(y-2040)

dy/(y-2040)=-0.025dt

∫dy/(y-2040)=-0.025∫dt

Ln(y-2040)=-0.025t+c

$y-2040=e^{-0.025+c}$

$y-2040=e^{-0.025t}$

$y=y_o e^{-0.025t}+2040$

initially when t=1,y=150ib

$150=y_o e^{-0.025t}+2040$

$150-2040=y_o*1$

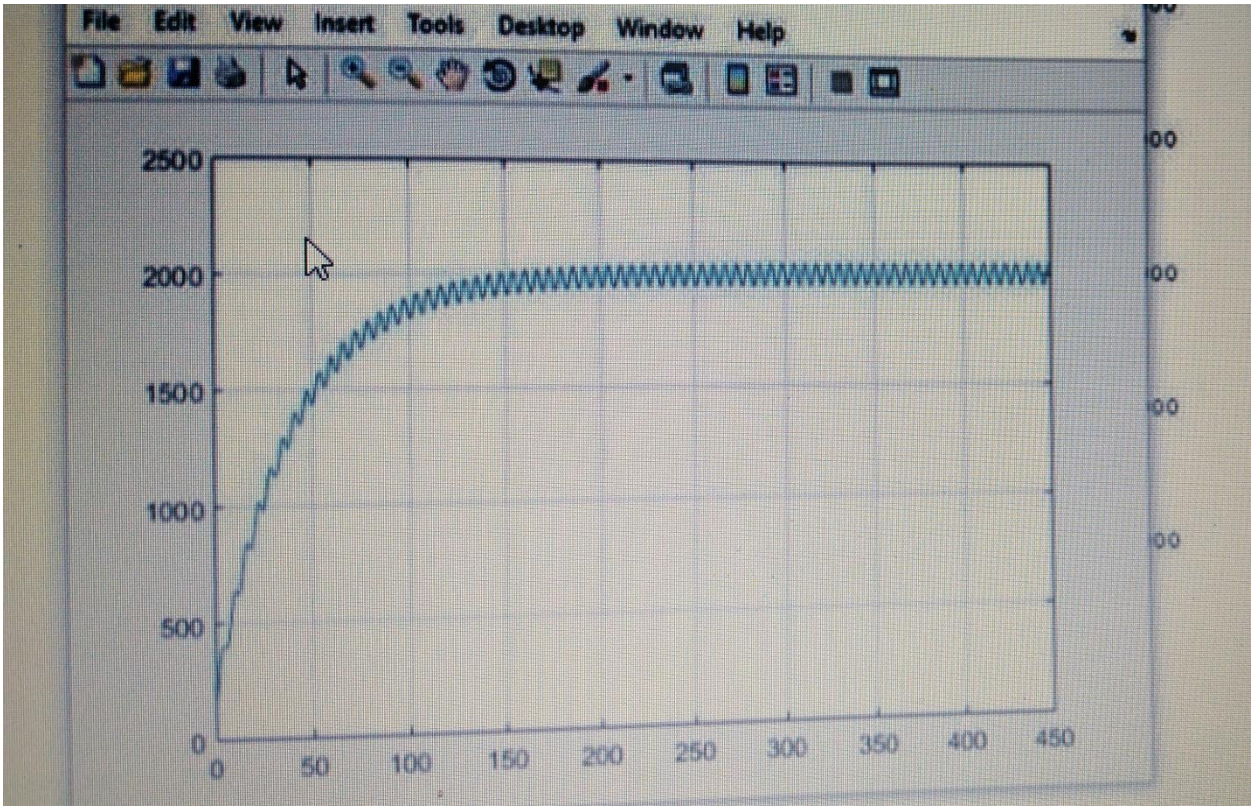
$Y_0=-1890, y=-1890e^{-0.025t}+2040$

$Y=2040-1890e^{-0.025t}$

c.) 2.) MATHLAB PROGRAM

```
1- Commandwindow
2- clear
3- clc
4- close all
5- syms n, t
6- ans=dsolve('Dm+0.025*m=50+50*sin(t)','m(0)=150)
7- t=0:0.5:450
8- plot(t,tn)
9- grid on
10- tn=subs(ans,t)
```

```
commandwindow
clear
clc
close all
syms m t
ans=dsolve('Dm+0.025*m=50+50*sin(t)','m(0)=150')
t=0:0.5:450
tn=subs(ans,t)
plot(t,tn)
grid on
```



MATH LAB PROGRAM AND GRAPH

2.)

a.) MATHLAB PROGRAM

```
Commandwindow
clear
clc
close all
syms t
values=[]
t=1:1:500
mean=1000-((exp(-0.05*t))*800)
y=1000+(50/1.0025)*sin(t)+(2.5/1.0025)*cos(t)-((exp(-0.05*t))*802.4
if rem(t,2) ==0
values=[values ,mean]
else
```

13- values=[values ,y]

14 - end

15- excelvalues=transpose(values)

16- mins=transpose(t)

17- plot(t, values)

18- grid on

19- grid minor

20- xlabel(‘time(mins)’)

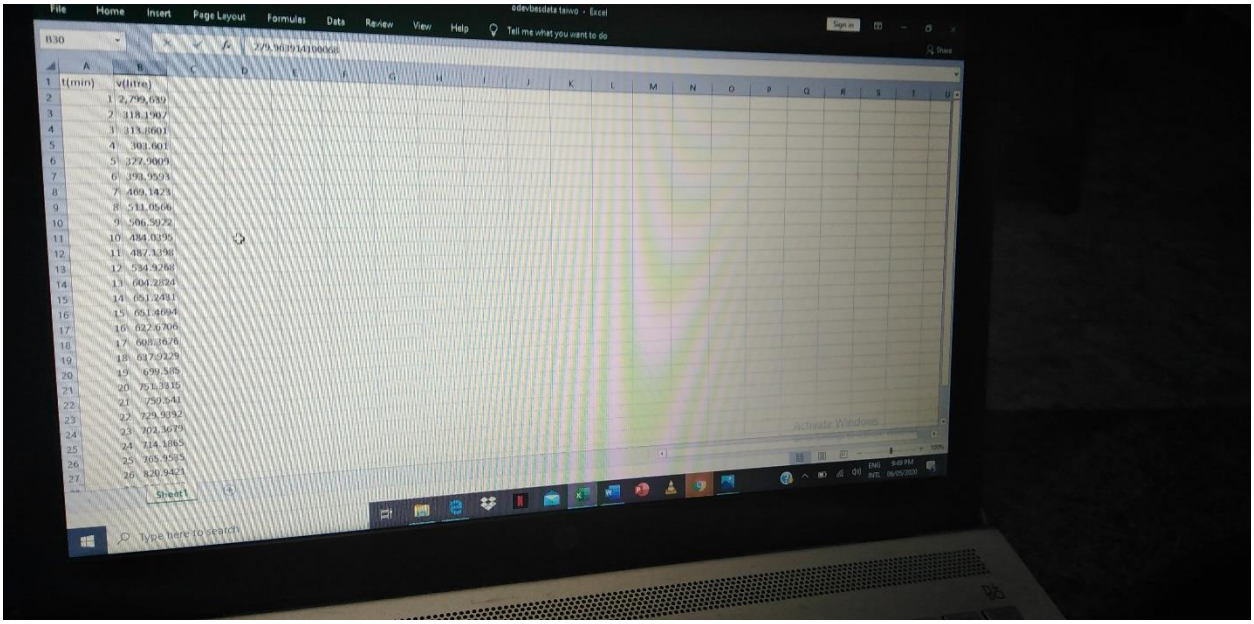
21- ylabel(‘volume(liters)’)

22- xlswrite(‘odevbesdata.xlsx’,(‘t(min)’},’veriler’,’Al’)

23- xlswrite(‘odevbesdata.xlsx’,mins,’veriler’,’A2’)

24- xlswrite(‘odevbesdata.xlsx’,(‘V(liter)’},’veriler’,’B1’)

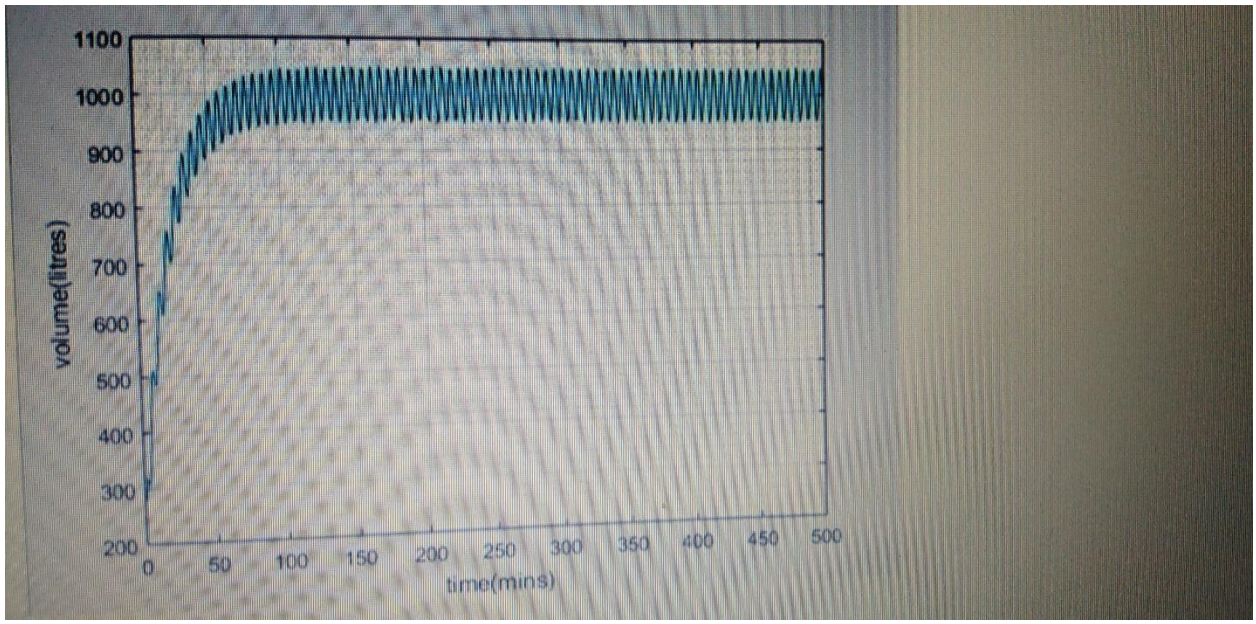
25- xlswrite(‘odevbesdata.xlsx’,excelvalues,’veriler’,’B2’)



Excel files

```
commandwindow
clear
clc
close all
syms t
values=[]
t=1:1:500
mean=1000-((exp(-0.05*t))*800)
y=1000+(50/1.0025)*sin(t)+(2.5/1.0025)*cos(t)-((exp(-0.05*t))*802

if rem(t,2) ==0
    values=[values,mean]
else
    values=[values,y]
end
excelvalues=transpose(values)
mins=transpose(t)
plot(t,values)
grid on
grid minor
xlabel ('time(mins)')
ylabel('volume(litres)')
xlswrite('odevbesdata.xlsx',{'t(min)'},'veriler','A1')
xlswrite('odevbesdata.xlsx',mins,'veriler','A2')
xlswrite('odevbesdata.xlsx',{'V(Litre)'},'veriler','B1')
xlswrite('odevbesdata.xlsx',excelvalues,'veriler','B2')
```



Math lab program and graph