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17/eng05/033

Eng382 assignment

Mechatronics

Solution

1 function [dmdt] = chokes(t,m)

2 dmdt(1)= -((15/500)\*m(1))+ ((5/1000)\*m(2))+1;

3 dmdt(2)= ((15/500)\*m(1))-((18/1000)\*m(2))+ ((3/400)\*m(3));

4 dmdt(3)= ((13/1000)\*m(2))-((13/400)\*m(3));

1. dmdt=dmdt';

6 end

* 1. commandwindow
  2. clear
  3. clc
  4. close all

5 width= [0:1:1200];

1. initial=[0 0 0];
2. [t,Q]= ode45(@chokes,width,initial);
3. figure(1)
4. subplot(3,1,1)

10 plot(t,Q(:,1),'go-')

1. xlabel('Time (min)')
2. ylabel('Volume(litres)')
3. legend('Tank 1', 'Location', 'South')
4. grid on
5. axis tight
6. title('Figure 1:Dynamic Responses of the Tanks')
7. subplot(3,1,2)

18 plot(t,Q(:,2),'b\*--')

1. xlabel('Time (min)')
2. ylabel('Volume(litres)')
3. legend('Tank 2', 'Location', 'South')
4. grid on
5. axis tight
6. subplot(3,1,3)

25 plot(t,Q(:,3),'r+--')

1. xlabel('Time(min)')
2. ylabel('Volume (litres)')
3. legend('Tank 3', 'Location', 'South' )
4. grid on
5. axis tight

