Tutorial 3

Ques no 6

c) m=5;

t=0:0.5:5;

x=2+(0\*t);

y=3+(10\*t);

z=0+(0\*t);

r=[x;y;z];

v=[0\*t;10+0\*t;0\*t];

L=m\*cross(r,v);

R=[t;L];

fprintf('%5s %7s %8s %8s\n', 'Time','L(x)','L(y)','L(z)');

fprintf('%4.1f %6.0f %8.0f %9.0f\n',R);

>> qqqq

Time L(x) L(y) L(z)

0.0 0 0 100

0.5 0 0 100

1.0 0 0 100

1.5 0 0 100

2.0 0 0 100

2.5 0 0 100

3.0 0 0 100

3.5 0 0 100

4.0 0 0 100

4.5 0 0 100

5.0 0 0 100

Ques no 10

>> syms R1 R2 R3 R4 R5 V1 V2

>> R=[R1+R2 -R4 0;-R4 R2+R4+R5 -R5;0 -R5 R3+R5]

R =

[ R1 + R2, -R4, 0]

[ -R4, R2 + R4 + R5, -R5]

[ 0, -R5, R3 + R5]

>> V=[-V1;0;V2]

V =

-V1

0

V2

>> I=inv(R)\*V

I =

(R4\*R5\*V2)/(R2^2\*R3 - R3\*R4^2 + R2^2\*R5 - R4^2\*R5 + R1\*R2\*R3 + R1\*R2\*R5 + R1\*R3\*R4 + R1\*R3\*R5 + R2\*R3\*R4 + R1\*R4\*R5 + R2\*R3\*R5 + R2\*R4\*R5) - (V1\*(R2\*R3 + R2\*R5 + R3\*R4 + R3\*R5 + R4\*R5))/(R2^2\*R3 - R3\*R4^2 + R2^2\*R5 - R4^2\*R5 + R1\*R2\*R3 + R1\*R2\*R5 + R1\*R3\*R4 + R1\*R3\*R5 + R2\*R3\*R4 + R1\*R4\*R5 + R2\*R3\*R5 + R2\*R4\*R5)

(R5\*V2\*(R1 + R2))/(R2^2\*R3 - R3\*R4^2 + R2^2\*R5 - R4^2\*R5 + R1\*R2\*R3 + R1\*R2\*R5 + R1\*R3\*R4 + R1\*R3\*R5 + R2\*R3\*R4 + R1\*R4\*R5 + R2\*R3\*R5 + R2\*R4\*R5) - (R4\*V1\*(R3 + R5))/(R2^2\*R3 - R3\*R4^2 + R2^2\*R5 - R4^2\*R5 + R1\*R2\*R3 + R1\*R2\*R5 + R1\*R3\*R4 + R1\*R3\*R5 + R2\*R3\*R4 + R1\*R4\*R5 + R2\*R3\*R5 + R2\*R4\*R5)

(V2\*(R1\*R2 + R1\*R4 + R1\*R5 + R2\*R4 + R2\*R5 + R2^2 - R4^2))/(R2^2\*R3 - R3\*R4^2 + R2^2\*R5 - R4^2\*R5 + R1\*R2\*R3 + R1\*R2\*R5 + R1\*R3\*R4 + R1\*R3\*R5 + R2\*R3\*R4 + R1\*R4\*R5 + R2\*R3\*R5 + R2\*R4\*R5) - (R4\*R5\*V1)/(R2^2\*R3 - R3\*R4^2 + R2^2\*R5 - R4^2\*R5 + R1\*R2\*R3 + R1\*R2\*R5 + R1\*R3\*R4 + R1\*R3\*R5 + R2\*R3\*R4 + R1\*R4\*R5 + R2\*R3\*R5 + R2\*R4\*R5)

>> I1=I(1)

I1 =

(R4\*R5\*V2)/(R2^2\*R3 - R3\*R4^2 + R2^2\*R5 - R4^2\*R5 + R1\*R2\*R3 + R1\*R2\*R5 + R1\*R3\*R4 + R1\*R3\*R5 + R2\*R3\*R4 + R1\*R4\*R5 + R2\*R3\*R5 + R2\*R4\*R5) - (V1\*(R2\*R3 + R2\*R5 + R3\*R4 + R3\*R5 + R4\*R5))/(R2^2\*R3 - R3\*R4^2 + R2^2\*R5 - R4^2\*R5 + R1\*R2\*R3 + R1\*R2\*R5 + R1\*R3\*R4 + R1\*R3\*R5 + R2\*R3\*R4 + R1\*R4\*R5 + R2\*R3\*R5 + R2\*R4\*R5)

>> I2=I(2)

I2 =

(R5\*V2\*(R1 + R2))/(R2^2\*R3 - R3\*R4^2 + R2^2\*R5 - R4^2\*R5 + R1\*R2\*R3 + R1\*R2\*R5 + R1\*R3\*R4 + R1\*R3\*R5 + R2\*R3\*R4 + R1\*R4\*R5 + R2\*R3\*R5 + R2\*R4\*R5) - (R4\*V1\*(R3 + R5))/(R2^2\*R3 - R3\*R4^2 + R2^2\*R5 - R4^2\*R5 + R1\*R2\*R3 + R1\*R2\*R5 + R1\*R3\*R4 + R1\*R3\*R5 + R2\*R3\*R4 + R1\*R4\*R5 + R2\*R3\*R5 + R2\*R4\*R5)

>> I3=I(3)

I3 =

(V2\*(R1\*R2 + R1\*R4 + R1\*R5 + R2\*R4 + R2\*R5 + R2^2 - R4^2))/(R2^2\*R3 - R3\*R4^2 + R2^2\*R5 - R4^2\*R5 + R1\*R2\*R3 + R1\*R2\*R5 + R1\*R3\*R4 + R1\*R3\*R5 + R2\*R3\*R4 + R1\*R4\*R5 + R2\*R3\*R5 + R2\*R4\*R5) - (R4\*R5\*V1)/(R2^2\*R3 - R3\*R4^2 + R2^2\*R5 - R4^2\*R5 + R1\*R2\*R3 + R1\*R2\*R5 + R1\*R3\*R4 + R1\*R3\*R5 + R2\*R3\*R4 + R1\*R4\*R5 + R2\*R3\*R5 + R2\*R4\*R5)

Ques no 8

>> A=[1/2 -1/2 0;-1/2 (1/2+j\*0.2-1/(j\*10)) -1/(j\*10);0 -1/(j\*10) ((1/10)+(1/(j\*10)))]

A =

0.5000 + 0.0000i -0.5000 + 0.0000i 0.0000 + 0.0000i

-0.5000 + 0.0000i 0.5000 + 0.3000i 0.0000 + 0.1000i

0.0000 + 0.0000i 0.0000 + 0.1000i 0.1000 - 0.1000i

>> B=[-1;0;0]

B =

-1

0

0

>> A\B

ans =

-2.4000 + 2.8000i

-0.4000 + 2.8000i

1.2000 + 1.6000i

Ques no 9

t=linspace(0,0.2,100);

x=(0.5+(5\*t)).\*sin(((2\*pi)/3)\*t).\*cos(4\*pi.\*t);

y=(0.5+(5\*t)).\*sin(((2\*pi)/3)\*t).\*sin(4\*pi.\*t);

z=(0.5+(5\*t)).\*cos(((2\*pi)/3)\*t);

[x y]=meshgrid(x,y);

plot3(x,y,z)

xlabel('x coordinate');

ylabel('y coordinate');

zlabel('z coordinate');

grid on

