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Matric No: 17/ENG05/021

ASSIGNMENT 3

**Question:**

With the aid of matlab *mfile*, plot the dynamic responses of voltages (v) in volts , the current(i) , Through the capacitors in ampere and the power (p) in watt for time *t*=0 sec to *t*=0.35 sec with a step size of 0.01 sec on the same graph . The labels of the y- and the x-axes of the graph should be variables and time (sec) respectively, and the graph should have both major and minor grid lines. Also, the legend of the plots should have both major and minor grid lines. Also, the legends of plots should be voltage (v), currents (a) and power (w). The colours of the line of the voltage, the currents and the power should be blue, red and black, respectively.

To solve V (t) =110cos (120πt)

commandwindow

clear

clc

close all

syms t

V=110\*cos(120\*pi\*t)

C=100\*10^-6

Q=C\*V

t=0:0.01:0.35

Vn=subs(V,t)

Vnn=double(Vn)

I=diff(Q)

In=subs(I,t)

P=I\*V

Pn=subs(P,t)

Pnn=double(Pn)

plot(t,Vnn,'blue')

hold on

plot(t,In,'red')

hold on

plot(t,Pnn,'black')

xlabel('Time(secs)')

ylabel('Variable')

legend('Voltage(V)','Current(A)','Power(W)')

axis tight

grid on

grid minor

OUTPUT

V =

110\*cos(120\*pi\*t)

C =

1.0000e-04

Q =

(11\*cos(120\*pi\*t))/1000

t =

Columns 1 through 3

0 0.0100 0.0200

Columns 4 through 6

0.0300 0.0400 0.0500

Columns 7 through 9

0.0600 0.0700 0.0800

Columns 10 through 12

0.0900 0.1000 0.1100

Columns 13 through 15

0.1200 0.1300 0.1400

Columns 16 through 18

0.1500 0.1600 0.1700

Columns 19 through 21

0.1800 0.1900 0.2000

Columns 22 through 24

0.2100 0.2200 0.2300

Columns 25 through 27

0.2400 0.2500 0.2600

Columns 28 through 30

0.2700 0.2800 0.2900

Columns 31 through 33

0.3000 0.3100 0.3200

Columns 34 through 36

0.3300 0.3400 0.3500

Vn =

[ 110, - (55\*5^(1/2))/2 - 55/2, (55\*5^(1/2))/2 - 55/2, (55\*5^(1/2))/2 - 55/2, - (55\*5^(1/2))/2 - 55/2, 110, - (55\*5^(1/2))/2 - 55/2, (55\*5^(1/2))/2 - 55/2, (55\*5^(1/2))/2 - 55/2, - (55\*5^(1/2))/2 - 55/2, 110, - (55\*5^(1/2))/2 - 55/2, (55\*5^(1/2))/2 - 55/2, (55\*5^(1/2))/2 - 55/2, - (55\*5^(1/2))/2 - 55/2, 110, - (55\*5^(1/2))/2 - 55/2, (55\*5^(1/2))/2 - 55/2, (55\*5^(1/2))/2 - 55/2, - (55\*5^(1/2))/2 - 55/2, 110, - (55\*5^(1/2))/2 - 55/2, (55\*5^(1/2))/2 - 55/2, (55\*5^(1/2))/2 - 55/2, - (55\*5^(1/2))/2 - 55/2, 110, - (55\*5^(1/2))/2 - 55/2, (55\*5^(1/2))/2 - 55/2, (55\*5^(1/2))/2 - 55/2, - (55\*5^(1/2))/2 - 55/2, 110, - (55\*5^(1/2))/2 - 55/2, (55\*5^(1/2))/2 - 55/2, (55\*5^(1/2))/2 - 55/2, - (55\*5^(1/2))/2 - 55/2, 110]

Vnn =

Columns 1 through 3

110.0000 -88.9919 33.9919

Columns 4 through 6

33.9919 -88.9919 110.0000

Columns 7 through 9

-88.9919 33.9919 33.9919

Columns 10 through 12

-88.9919 110.0000 -88.9919

Columns 13 through 15

33.9919 33.9919 -88.9919

Columns 16 through 18

110.0000 -88.9919 33.9919

Columns 19 through 21

33.9919 -88.9919 110.0000

Columns 22 through 24

-88.9919 33.9919 33.9919

Columns 25 through 27

-88.9919 110.0000 -88.9919

Columns 28 through 30

33.9919 33.9919 -88.9919

Columns 31 through 33

110.0000 -88.9919 33.9919

Columns 34 through 36

33.9919 -88.9919 110.0000

I =

-(33\*pi\*sin(120\*pi\*t))/25

In =

[ 0, (33\*2^(1/2)\*pi\*(5 - 5^(1/2))^(1/2))/100, -(33\*pi\*2^(1/2)\*(5^(1/2) + 5)^(1/2))/100, (33\*pi\*2^(1/2)\*(5^(1/2) + 5)^(1/2))/100, -(33\*2^(1/2)\*pi\*(5 - 5^(1/2))^(1/2))/100, 0, (33\*2^(1/2)\*pi\*(5 - 5^(1/2))^(1/2))/100, -(33\*pi\*2^(1/2)\*(5^(1/2) + 5)^(1/2))/100, (33\*pi\*2^(1/2)\*(5^(1/2) + 5)^(1/2))/100, -(33\*2^(1/2)\*pi\*(5 - 5^(1/2))^(1/2))/100, 0, (33\*2^(1/2)\*pi\*(5 - 5^(1/2))^(1/2))/100, -(33\*pi\*2^(1/2)\*(5^(1/2) + 5)^(1/2))/100, (33\*pi\*2^(1/2)\*(5^(1/2) + 5)^(1/2))/100, -(33\*2^(1/2)\*pi\*(5 - 5^(1/2))^(1/2))/100, 0, (33\*2^(1/2)\*pi\*(5 - 5^(1/2))^(1/2))/100, -(33\*pi\*2^(1/2)\*(5^(1/2) + 5)^(1/2))/100, (33\*pi\*2^(1/2)\*(5^(1/2) + 5)^(1/2))/100, -(33\*2^(1/2)\*pi\*(5 - 5^(1/2))^(1/2))/100, 0, (33\*2^(1/2)\*pi\*(5 - 5^(1/2))^(1/2))/100, -(33\*pi\*2^(1/2)\*(5^(1/2) + 5)^(1/2))/100, (33\*pi\*2^(1/2)\*(5^(1/2) + 5)^(1/2))/100, -(33\*2^(1/2)\*pi\*(5 - 5^(1/2))^(1/2))/100, 0, (33\*2^(1/2)\*pi\*(5 - 5^(1/2))^(1/2))/100, -(33\*pi\*2^(1/2)\*(5^(1/2) + 5)^(1/2))/100, (33\*pi\*2^(1/2)\*(5^(1/2) + 5)^(1/2))/100, -(33\*2^(1/2)\*pi\*(5 - 5^(1/2))^(1/2))/100, 0, (33\*2^(1/2)\*pi\*(5 - 5^(1/2))^(1/2))/100, -(33\*pi\*2^(1/2)\*(5^(1/2) + 5)^(1/2))/100, (33\*pi\*2^(1/2)\*(5^(1/2) + 5)^(1/2))/100, -(33\*2^(1/2)\*pi\*(5 - 5^(1/2))^(1/2))/100, 0]

P =

-(726\*pi\*cos(120\*pi\*t)\*sin(120\*pi\*t))/5

Pn =

[ 0, -(363\*2^(1/2)\*pi\*(5^(1/2)/4 + 1/4)\*(5 - 5^(1/2))^(1/2))/10, -(363\*2^(1/2)\*pi\*(5^(1/2)/4 - 1/4)\*(5^(1/2) + 5)^(1/2))/10, (363\*2^(1/2)\*pi\*(5^(1/2)/4 - 1/4)\*(5^(1/2) + 5)^(1/2))/10, (363\*2^(1/2)\*pi\*(5^(1/2)/4 + 1/4)\*(5 - 5^(1/2))^(1/2))/10, 0, -(363\*2^(1/2)\*pi\*(5^(1/2)/4 + 1/4)\*(5 - 5^(1/2))^(1/2))/10, -(363\*2^(1/2)\*pi\*(5^(1/2)/4 - 1/4)\*(5^(1/2) + 5)^(1/2))/10, (363\*2^(1/2)\*pi\*(5^(1/2)/4 - 1/4)\*(5^(1/2) + 5)^(1/2))/10, (363\*2^(1/2)\*pi\*(5^(1/2)/4 + 1/4)\*(5 - 5^(1/2))^(1/2))/10, 0, -(363\*2^(1/2)\*pi\*(5^(1/2)/4 + 1/4)\*(5 - 5^(1/2))^(1/2))/10, -(363\*2^(1/2)\*pi\*(5^(1/2)/4 - 1/4)\*(5^(1/2) + 5)^(1/2))/10, (363\*2^(1/2)\*pi\*(5^(1/2)/4 - 1/4)\*(5^(1/2) + 5)^(1/2))/10, (363\*2^(1/2)\*pi\*(5^(1/2)/4 + 1/4)\*(5 - 5^(1/2))^(1/2))/10, 0, -(363\*2^(1/2)\*pi\*(5^(1/2)/4 + 1/4)\*(5 - 5^(1/2))^(1/2))/10, -(363\*2^(1/2)\*pi\*(5^(1/2)/4 - 1/4)\*(5^(1/2) + 5)^(1/2))/10, (363\*2^(1/2)\*pi\*(5^(1/2)/4 - 1/4)\*(5^(1/2) + 5)^(1/2))/10, (363\*2^(1/2)\*pi\*(5^(1/2)/4 + 1/4)\*(5 - 5^(1/2))^(1/2))/10, 0, -(363\*2^(1/2)\*pi\*(5^(1/2)/4 + 1/4)\*(5 - 5^(1/2))^(1/2))/10, -(363\*2^(1/2)\*pi\*(5^(1/2)/4 - 1/4)\*(5^(1/2) + 5)^(1/2))/10, (363\*2^(1/2)\*pi\*(5^(1/2)/4 - 1/4)\*(5^(1/2) + 5)^(1/2))/10, (363\*2^(1/2)\*pi\*(5^(1/2)/4 + 1/4)\*(5 - 5^(1/2))^(1/2))/10, 0, -(363\*2^(1/2)\*pi\*(5^(1/2)/4 + 1/4)\*(5 - 5^(1/2))^(1/2))/10, -(363\*2^(1/2)\*pi\*(5^(1/2)/4 - 1/4)\*(5^(1/2) + 5)^(1/2))/10, (363\*2^(1/2)\*pi\*(5^(1/2)/4 - 1/4)\*(5^(1/2) + 5)^(1/2))/10, (363\*2^(1/2)\*pi\*(5^(1/2)/4 + 1/4)\*(5 - 5^(1/2))^(1/2))/10, 0, -(363\*2^(1/2)\*pi\*(5^(1/2)/4 + 1/4)\*(5 - 5^(1/2))^(1/2))/10, -(363\*2^(1/2)pi\*(5^(1/2)/4 - 1/4)\*(5^(1/2) + 5)^(1/2))/10, (363\*2^(1/2)\*pi\*(5^(1/2)/4 - 1/4)\*(5^(1/2) + 5)^(1/2))/10, (363\*2^(1/2)\*pi\*(5^(1/2)/4 + 1/4)\*(5 - 5^(1/2))^(1/2))/10, 0]

Pnn =

Columns 1 through 3

0 -216.9166 -134.0618

Columns 4 through 6

134.0618 216.9166 0

Columns 7 through 9

-216.9166 -134.0618 134.0618

Columns 10 through 12

216.9166 0 -216.9166

Columns 13 through 15

-134.0618 134.0618 216.9166

Columns 16 through 18

0 -216.9166 -134.0618

Columns 19 through 21

134.0618 216.9166 0

Columns 22 through 24

-216.9166 -134.0618 134.0618

Columns 25 through 27

216.9166 0 -216.9166

Columns 28 through 30

-134.0618 134.0618 216.9166

Columns 31 through 33

0 -216.9166 -134.0618

Columns 34 through 36

134.0618 216.9166 0

GRAPH

