**UDOSEN EKEMINI JOHN**

**ELECTRICAL/ELECTRONICS ENGINEERING**

**17/ENG04/070**

**17/11/2018**

**ANSWER**

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

Qm = subs(Q,t)

Vm = subs(V,t)

I = diff(Q)

Im = subs(I,t)

P = I\*V

Pm = subs(P,t)

Cm = double(C)

figure

plot(t,Vm,t,Im,t,Cm)

plot(t,Vm,'blue',t,Im,'red',t,Cm,'black')

axis tight

grid on

grid minor

xlabel('Time(sec)')

ylabel('Variable')

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

**0UTPUT**

V =

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

C =

1.0000e-04

Q =

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

t =

Columns 1 through 7

0 0.0100 0.0200 0.0300 0.0400 0.0500 0.0600

Columns 8 through 14

0.0700 0.0800 0.0900 0.1000 0.1100 0.1200 0.1300

Columns 15 through 21

0.1400 0.1500 0.1600 0.1700 0.1800 0.1900 0.2000

Columns 22 through 28

0.2100 0.2200 0.2300 0.2400 0.2500 0.2600 0.2700

Columns 29 through 35

0.2800 0.2900 0.3000 0.3100 0.3200 0.3300 0.3400

Column 36

0.3500

Qm =

[ 11/1000, - (11\*5^(1/2))/4000 - 11/4000, (11\*5^(1/2))/4000 - 11/4000, (11\*5^(1/2))/4000 - 11/4000, - (11\*5^(1/2))/4000 - 11/4000, 11/1000, - (11\*5^(1/2))/4000 - 11/4000, (11\*5^(1/2))/4000 - 11/4000, (11\*5^(1/2))/4000 - 11/4000, - (11\*5^(1/2))/4000 - 11/4000, 11/1000, - (11\*5^(1/2))/4000 - 11/4000, (11\*5^(1/2))/4000 - 11/4000, (11\*5^(1/2))/4000 - 11/4000, - (11\*5^(1/2))/4000 - 11/4000, 11/1000, - (11\*5^(1/2))/4000 - 11/4000, (11\*5^(1/2))/4000 - 11/4000, (11\*5^(1/2))/4000 - 11/4000, - (11\*5^(1/2))/4000 - 11/4000, 11/1000, - (11\*5^(1/2))/4000 - 11/4000, (11\*5^(1/2))/4000 - 11/4000, (11\*5^(1/2))/4000 - 11/4000, - (11\*5^(1/2))/4000 - 11/4000, 11/1000, - (11\*5^(1/2))/4000 - 11/4000, (11\*5^(1/2))/4000 - 11/4000, (11\*5^(1/2))/4000 - 11/4000, - (11\*5^(1/2))/4000 - 11/4000, 11/1000, - (11\*5^(1/2))/4000 - 11/4000, (11\*5^(1/2))/4000 - 11/4000, (11\*5^(1/2))/4000 - 11/4000, - (11\*5^(1/2))/4000 - 11/4000, 11/1000]

Vm =

[ 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]

I =

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

Im =

[ 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

Pm =

[ 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]

Cm =

1.0000e-04

**PLOT**

