

### Question (4A)

commandwindow

P=55

Q=66

R=55

S=54

T=32

clear R % to remove R from workspace

clear T % to remove T from workspace

clc % to clear command window

### QUESTION (4B)

$$A := \begin{pmatrix} 1 & -2 & -1 & 3 \\ 2 & 3 & 0 & 1 \\ 1 & 0 & -4 & -2 \\ 0 & -1 & 3 & 1 \end{pmatrix}$$

$$B := \begin{pmatrix} 10 \\ 8 \\ 3 \\ -7 \end{pmatrix}$$

$$C := A^{-1} \cdot B$$

$$D := \begin{pmatrix} 273 \\ 273 \\ 273 \\ 273 \end{pmatrix}$$

$$C = \begin{pmatrix} -1 \\ 2 \\ -3 \\ 4 \end{pmatrix}$$

$$E := C + D$$

$$E = \begin{pmatrix} 272 \\ 275 \\ 270 \\ 277 \end{pmatrix}$$

Therefore  $T_1 := 272$   $T_2 := 275$   $T_3 := 270$   $T_4 := 277$

**%QUESTION [4B] MATLAB**

```
commandwindow
```

```
clear
```

```
clc
```

```
A = [1,-2,-1,3; 2,3,0,1; 1,0,-4,-2; 0,-1,3,1]
```

```
B = [10;8;3;-7]
```

```
K = [273;273;273;273]
```

```
C = inv(A)
```

```
D = C*B
```

```
% To convert to kelvin
```

```
KA = D + K
```

**A =**

1	-2	-1	3
2	3	0	1
1	0	-4	-2
0	-1	3	1

**B =**

10  
8  
3  
-7

**K =**

273  
273  
273  
273

**C =**

0.0267	0.2400	0.4933	0.6667
-0.0933	0.1600	-0.2267	-0.3333
-0.1067	0.0400	0.0267	0.3333
0.2267	0.0400	-0.3067	-0.3333

**D =**

-1.0000  
2.0000  
-3.0000  
4.0000

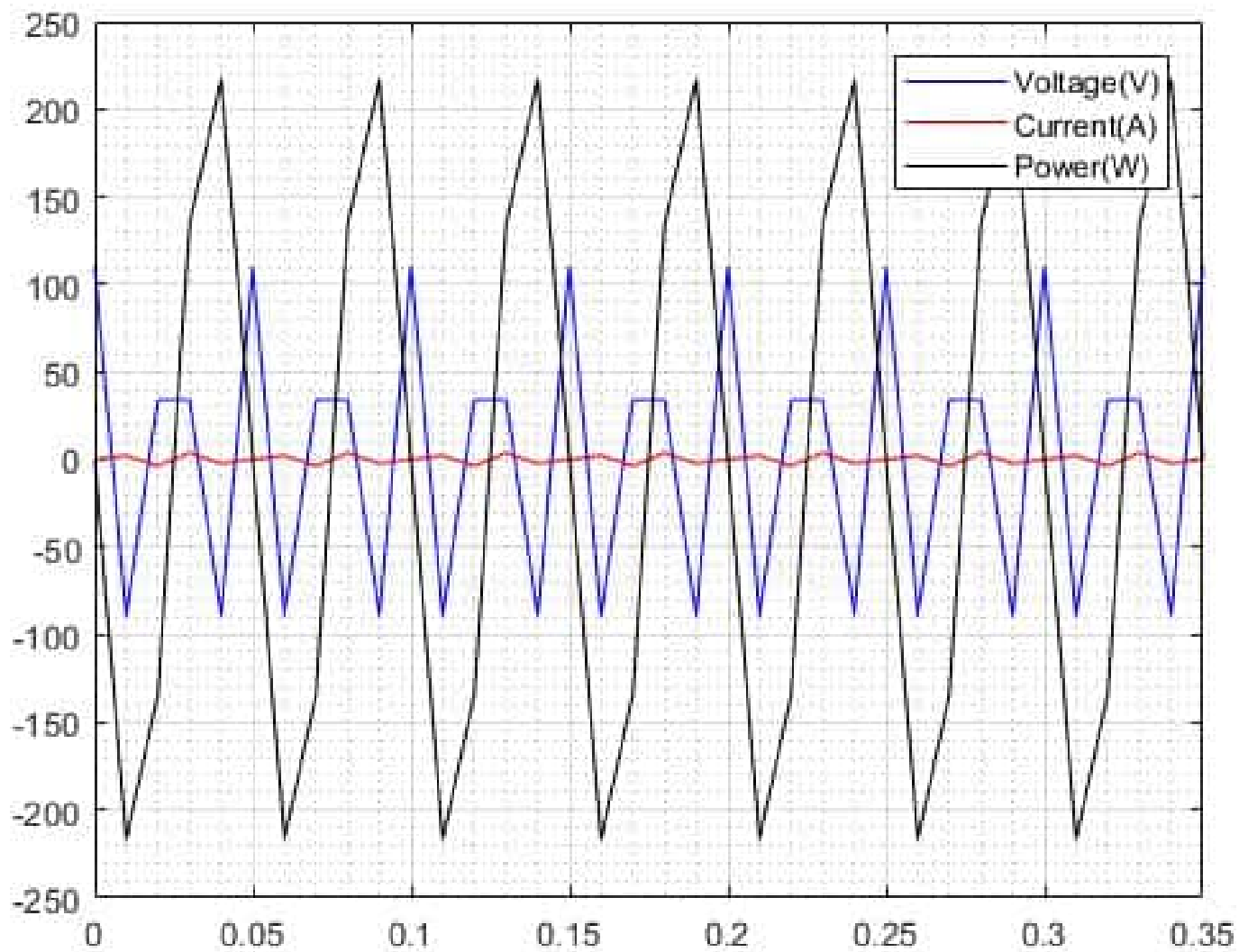
**KA =**

272  
275  
270  
277

$\vec{I} \gg \vec{I} \approx I_1 = 272k, I_2 = 275k, I_3 = 270k, I_4 = 277k$

### QUESTION (4C)

```
commandwindow
clear
clc
close all
syms t
V = 110*cos(120*pi*t)
C = 0.0001
Q = C*V
current = diff(Q) %since current is dq/dt
power = current*V
tn = [0:0.01:0.35]
Vn = subs(V,tn)
In = subs(current,tn)
Pn = subs(power,tn)
plot(tn,Vn,'blue',tn,In,'red',tn,Pn,'black')
xlabel = 'Time(sec)'
ylabel = 'Variable'
grid on
grid minor
legend('Voltage (V)', 'Current (A)', 'Power (W)')
```



QUESTION (4D)

$$f(t) := 2 + 2t - \cos\left(\frac{\pi t}{10}\right)$$

$$g(t) := 2 \sin\left(\frac{\pi t}{70}\right)$$

$$t := 0..10$$

