Text, letter

Description automatically generated

Exercise 1

Task A

A=1;

f=5;

fi=0;

w=2\*pi()\*f;

t=linspace(0,1,200);

for ii=1:length(t)

y(ii)=A\*cos(w\*t(ii)+fi);

end

%y=A\*cos(w\*t+fi); (Another solution to make a graph)

plot(t,y)

Graphical user interface, chart

Description automatically generated

Task B

Graphical user interface, chart

Description automatically generatedA= 0

Graphical user interface, chart

Description automatically generatedA = 10

If you change A , then Y axis increases, amplitude becomes higher.

Task C

Chart, line chart

Description automatically generated

W=6.28 if f = 1

If you change f, then omega also changes and if omega is changed, then period of the graph decreases (is decreasing). Check the graph under, in this case w(omega) = 62.83, f = 10 Hz

Graphical user interface, chart

Description automatically generated

Task D

Graphical user interface, chart

Description automatically generatedIf you change , then graph shifts on horizontal axis making phase shifts.

In this case graph fi is pi/2, so graph shifts for 90 degrees from Task A graph.

Task E

t=linspace(0,1,201);

%t=0:1;

A=1;

f=5;

fi=0;

w=2\*pi()\*f;

W=((1/10)\*2\*pi());

Ts=(W/w);

n=(t./Ts);

n1=round(n);

N=unique(n1);

y=A\*cos(W\*N+fi);

stem(N,y)

Chart

Description automatically generated

Task F

Sample time Ts = 0.02 s

Tasks G, H, I, J

G) A = 0,5

H) fi = 0 degrees

I) w = 2\*pi\*5

J) w=2\*pi/T 🡺 2\*pi\*10 = 2\*pi/T 🡺 T = 1/10 = 0,1 s

Exercise 2

Tasks K and L

n=0:4;

subplot(3,1,1);

x1=0.5\*cos(((10\*pi)/7)\*n+(1/4)\*pi);

stem(n,x1)

subplot(3,1,2);

x2=0.3\*cos(((20\*pi)/7)\*n);

stem(n,x2)

subplot(3,1,3); %sum

x3=x1+x2;

stem(n,x3)

A picture containing table

Description automatically generated

Task M

n=-10:10;

i=find((n>=0)&(n<=4));

i=1:length(n);

x1=0.5\*cos(((10\*pi)/7)\*n+(1/4)\*pi);

x2=0.3\*cos(((20\*pi)/7)\*n);

x3=x1+x2;

x4=x3(end:-1:1);

for k=3:length(n)

x5(k)=x4(k-2);

end

subplot(2,1,1); %mirror

stem(n(i),x4(i))

subplot(2,1,2); %delay

stem(n(i),x5(i))

A picture containing timeline

Description automatically generated

Schematic

Description automatically generatedExercise 3