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%REG NO:20010316
%SEMESTER:V
%SECTION:C
%COURSE CODE:ET2257
%COURSE NAME:SIGNAL AND SYSTEMS
%COURSE TEACHER:MINAL PATIL MAM
%DATE OF PERFORMANCE:07/10/222
```

expt no. 4

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% Example 1
% x(t)=1+sin(2*pi*t)
t=-4:0.01:4;
x1=sin(2*pi*t);
x1t=ones(1,length(t));
x2t=x1+x1t;

subplot(3,1,1),plot(t,x1);
xlabel('t-->');
ylabel('x(t)-->');
ylim([-2 2]);
title('x(t)=sin(2 pi t)');

subplot(3,1,2), plot(t,x1t);
xlabel('t-->');
ylabel('x1(t)-->');
ylim([-2 2]);
title('x1(t)=1');

subplot(3,1,3), plot(t,x2t);
xlabel('t-->');
ylabel('x2(t)-->');
ylim([-2 2]);

% Example 2
% x(t)= 1+sin(w0*t)+2*cos(w0*t)+cos(2*w0*t+pi/4)
t=0:0.01:1;
T=1;
w0=2*pi/T;
p=ones(1,length(t));
q=sin(w0*t);
r=2*cos(w0*t);
s=cos(2*w0*t+pi/4);
A=p+q+r+s;
figure;

subplot(3,2,1), plot(t,p);
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xlabel('t-->');
ylabel('p-->');
ylim([-2 2]);
title('p=1');

subplot(3,2,2), plot(t,q);
xlabel('t-->');
ylabel('q-->');
ylim([-2 2]);
title('q=sin(w0*t)');

subplot(3,2,3), plot(t,r);
xlabel('t-->');
ylabel('r-->');
ylim([-2 2]);
title('r=2*cos(w0*t)');

subplot(3,2,4), plot(t,s);
xlabel('t-->');
ylabel('s-->');
ylim([-2 2]);
title('s=cos(2*w0*t+pi/4)');

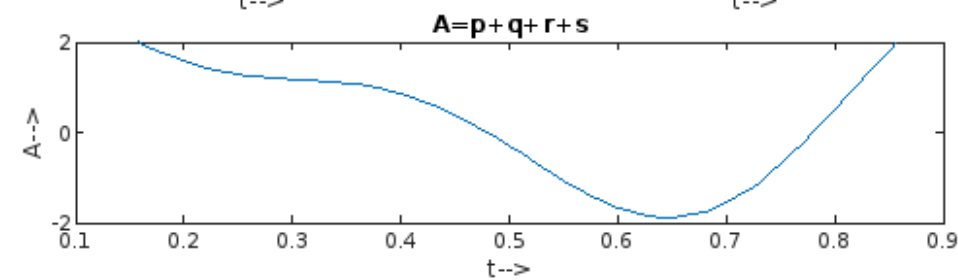
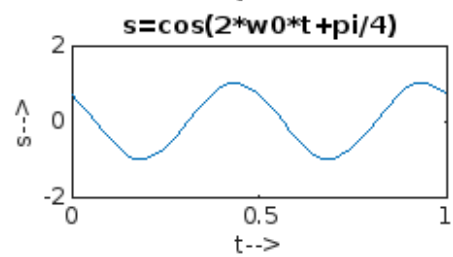
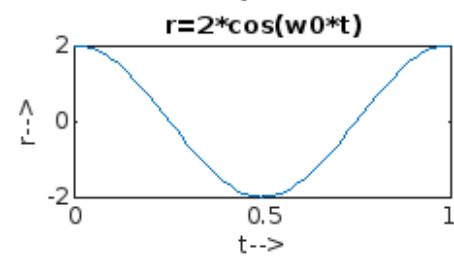
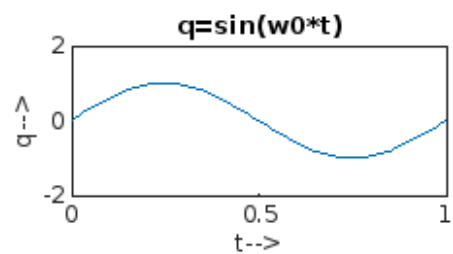
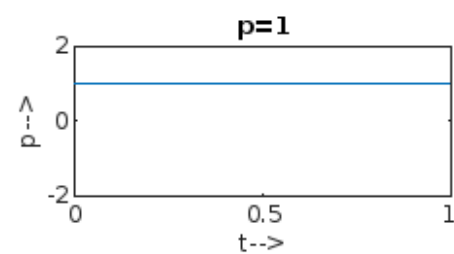
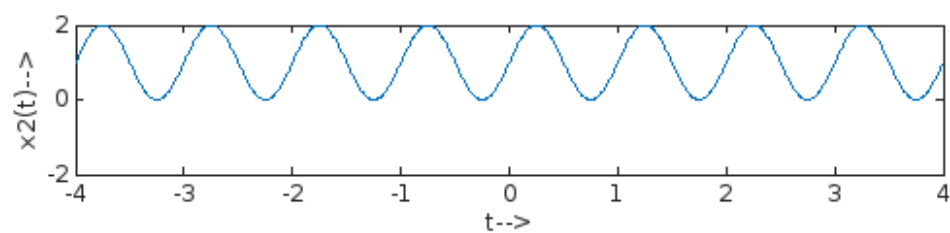
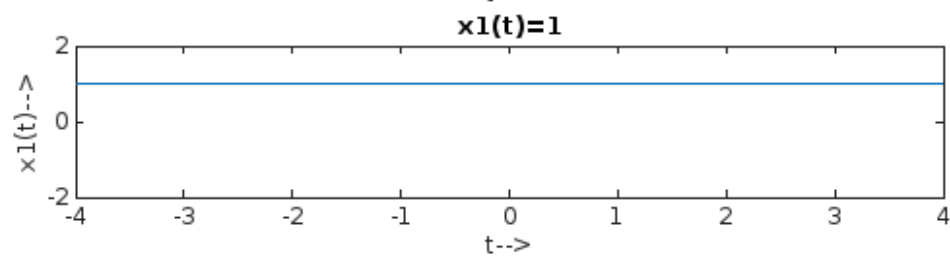
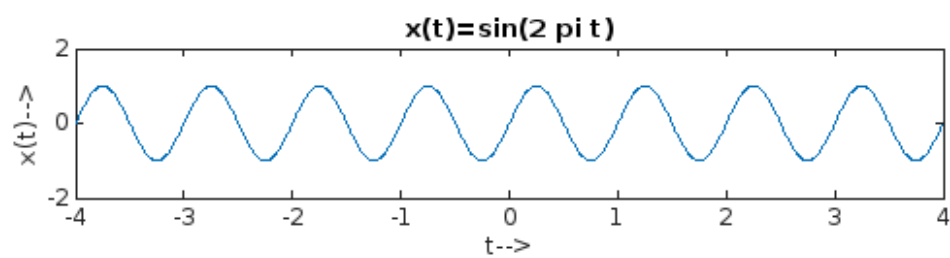
subplot(3,2,[5,6]), plot(t,A);
xlabel('t-->');
ylabel('A-->');
ylim([-2 2]);
title('A=p+q+r+s');

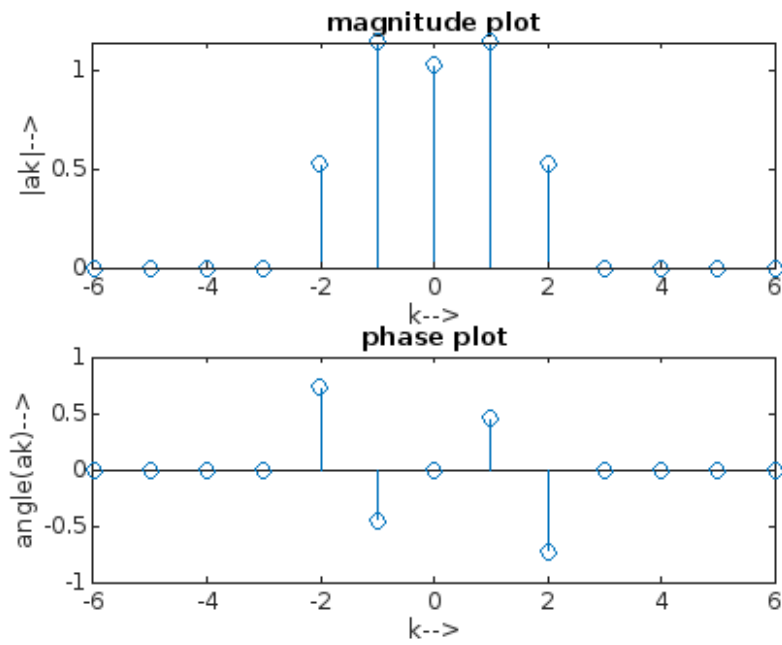
xt= ones(1,length(t))+sin(w0*t) +2*cos(w0*t) +cos(2*w0*t+pi/4);
for k=0:6;
    c(k+1,:)=exp(-1i*k*w0*t);
    a(k+1)=xt*c(k+1,:)/length(t);
    if (abs(a(k+1))<=0.1)
        a(k+1)=0;
    end
end

a_conj=conj(a);
ak =[a_conj(length(a_conj):-1:1),a(2:length(a))];
Mag_ak=abs(ak);

phase_ak=angle(ak);
figure;
subplot(2,2,[1,2]);
stem([-k:k],Mag_ak);
title('magnitude plot');
xlabel('k-->');
ylabel('|ak|-->');
subplot(2,2,[3,4]);
stem([-k:k],phase_ak);
title('phase plot');
xlabel('k-->');
ylabel('angle(ak)-->');

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