

Program

%ASK Modulation

```
clc;
clear all;
close all;
%GENERATE CARRIER SIGNAL
Tb=1; fc=10;
t=0:Tb/100:1;
c=sqrt(2/Tb)*sin(2*pi*fc*t);
%generate message signal
N=8;
m=rand(1,N);
t1=0;t2=Tb
for i=1:N
    t=[t1:.01:t2]
    if m(i)>0.5
        m(i)=1;
        m_s=ones(1,length(t));
    else
        m(i)=0;
        m_s=zeros(1,length(t));
    end
    message(i,:)=m_s;
    %product of carrier and message
    ask_sig(i,:)=c.*m_s;
    t1=t1+(Tb+.01);
    t2=t2+(Tb+.01);
    %plot the message and ASK signal
    subplot(5,1,2);axis([0 N -2 2]);plot(t,message(i,:), 'r');
    title('message signal');xlabel('t--->');ylabel('m(t)');grid on
    hold on
    subplot(5,1,4);plot(t,ask_sig(i,:));
    title('ASK signal');xlabel('t--->');ylabel('s(t)');grid on
    hold on
end
hold off
%Plot the carrier signal and input binary data
subplot(5,1,3);plot(t,c);
title('carrier signal');xlabel('t--->');ylabel('c(t)');grid on
subplot(5,1,1);stem(m);
title('binary data bits');xlabel('n--->');ylabel('b(n)');grid on
```

% ASK Demodulation

```
t1=0;t2=Tb
for i=1:N
    t=[t1:Tb/100:t2]
    %correlator
    x=sum(c.*ask_sig(i,:));
    %decision device
    if x>0
        demod(i)=1;
    else
        demod(i)=0;
    end
    t1=t1+(Tb+.01);
    t2=t2+(Tb+.01);
end
%plot demodulated binary data bits
subplot(5,1,5);stem(demod);
title('ASK demodulated signal'); xlabel('n--->');ylabel('b(n)');grid on
```