Program

% **FSK Modulation**

```
clc;
clear all;
close all;
%GENERATE CARRIER SIGNAL
Tb=1; fc1=2;fc2=5;
t=0:(Tb/100):Tb;
c1=sqrt(2/Tb)*sin(2*pi*fc1*t);
c2=sqrt(2/Tb)*sin(2*pi*fc2*t);
 %generate message signal
N=8;
m=rand(1,N);
t1=0;t2=Tb
for i=1:N
   t=[t1:(Tb/100):t2]
   if m(i)>0.5
      m(i)=1;
      m_s=ones(1,length(t));
      invm_s=zeros(1,length(t));
   else
      m(i)=0;
      m_s=zeros(1,length(t));
      invm_s=ones(1,length(t));
   end
   message(i,:)=m_s;
   %Multiplier
   fsk_sig1(i,:)=c1.*m_s;
   fsk_sig2(i,:)=c2.*invm_s;
   fsk=fsk_sig1+fsk_sig2;
   %plotting the message signal and the modulated signal
   subplot(3,2,2);axis([0 N -2 2]);plot(t,message(i,:),'r');
   title('message signal');xlabel('t---->');ylabel('m(t)');grid on;hold on;
   subplot(3,2,5);plot(t,fsk(i,:));
   title('FSK signal');xlabel('t---->');ylabel('s(t)');grid on;hold on;
   t1=t1+(Tb+.01); t2=t2+(Tb+.01);
  end
hold off
%Plotting binary data bits and carrier signal
subplot(3,2,1);stem(m);
title('binary data');xlabel('n---->');  ylabel('b(n)');grid on;
subplot(3,2,3);plot(t,c1);
title('carrier signal-1');xlabel('t---->');ylabel('c1(t)');grid on;
subplot(3,2,4);plot(t,c2);
title('carrier signal-2');xlabel('t---->');ylabel('c2(t)');grid on;
```

% **FSK Demodulation**

```
t1=0;t2=Tb
 for i=1:N
   t=[t1:(Tb/100):t2]
    %correlator
   x1=sum(c1.*fsk_sig1(i,:));
   x2=sum(c2.*fsk_sig2(i,:));
   x=x1-x2;
   %decision device
   if x>0
      demod(i)=1;
   else
      demod(i)=0;
   end
    t1=t1+(Tb+.01);
   t2=t2+(Tb+.01);
 end
 %Plotting the demodulated data bits
 subplot(3,2,6);stem(demod);
 title(' demodulated data');xlabel('n---->');ylabel('b(n)');  grid on;
```