%XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

%XXXX QPSK Modulation and Demodulation without consideration of noise XXXXX

%XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

clc;

clear all;

close all;

data=[0 1 0 1 1 1 0 0 1 1]; % information

%Number\_of\_bit=1024;

%data=randint(Number\_of\_bit,1);

figure(1)

stem(data, 'linewidth',3), grid on;

title(' Information before Transmiting ');

axis([ 0 11 0 1.5]);

data\_NZR=2\*data-1; % Data Represented at NZR form for QPSK modulation

s\_p\_data=reshape(data\_NZR,2,length(data)/2); % S/P convertion of data

br=10.^6; %Let us transmission bit rate 1000000

f=br; % minimum carrier frequency

T=1/br; % bit duration

t=T/99:T/99:T; % Time vector for one bit information

% XXXXXXXXXXXXXXXXXXXXXXX QPSK modulatio XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

y=[];

y\_in=[];

y\_qd=[];

for(i=1:length(data)/2)

y1=s\_p\_data(1,i)\*cos(2\*pi\*f\*t); % inphase component

y2=s\_p\_data(2,i)\*sin(2\*pi\*f\*t) ;% Quadrature component

y\_in=[y\_in y1]; % inphase signal vector

y\_qd=[y\_qd y2]; %quadrature signal vector

y=[y y1+y2]; % modulated signal vector

end

Tx\_sig=y; % transmitting signal after modulation

tt=T/99:T/99:(T\*length(data))/2;

figure(2)

subplot(3,1,1);

plot(tt,y\_in,'linewidth',3), grid on;

title(' wave form for inphase component in QPSK modulation ');

xlabel('time(sec)');

ylabel(' amplitude(volt0');

subplot(3,1,2);

plot(tt,y\_qd,'linewidth',3), grid on;

title(' wave form for Quadrature component in QPSK modulation ');

xlabel('time(sec)');

ylabel(' amplitude(volt0');

subplot(3,1,3);

plot(tt,Tx\_sig,'r','linewidth',3), grid on;

title('QPSK modulated signal (sum of inphase and Quadrature phase signal)');

xlabel('time(sec)');

ylabel(' amplitude(volt0');

% XXXXXXXXXXXXXXXXXXXXXXXXXXXX QPSK demodulation XXXXXXXXXXXXXXXXXXXXXXXXXX

Rx\_data=[];

Rx\_sig=Tx\_sig; % Received signal

for(i=1:1:length(data)/2)

%%XXXXXX inphase coherent dector XXXXXXX

Z\_in=Rx\_sig((i-1)\*length(t)+1:i\*length(t)).\*cos(2\*pi\*f\*t);

% above line indicat multiplication of received & inphase carred signal

Z\_in\_intg=(trapz(t,Z\_in))\*(2/T);% integration using trapizodial rull

if(Z\_in\_intg>0) % Decession Maker

Rx\_in\_data=1;

else

Rx\_in\_data=0;

end

%%XXXXXX Quadrature coherent dector XXXXXX

Z\_qd=Rx\_sig((i-1)\*length(t)+1:i\*length(t)).\*sin(2\*pi\*f\*t);

%above line indicat multiplication ofreceived & Quadphase carred signal

Z\_qd\_intg=(trapz(t,Z\_qd))\*(2/T);%integration using trapizodial rull

if (Z\_qd\_intg>0)% Decession Maker

Rx\_qd\_data=1;

else

Rx\_qd\_data=0;

end

Rx\_data=[Rx\_data Rx\_in\_data Rx\_qd\_data]; % Received Data vector

end

figure(3)

stem(Rx\_data,'linewidth',3)

title('Information after Receiveing ');

axis([ 0 11 0 1.5]), grid on;

% XXXXXXXXXXXXXXXXXXXXXXXXX end of program XXXXXXXXXXXXXXXXXXXXXXXXXX