clc;

clear;

sym=10000;*//No . of symbols*

M=4;

data1=grand(1,sym,"uin",0,1);*//Random Symbol generation from 0 to 1 with uniform distribution*

for j=1:2:length(data1)*// Seperation of I & Q component*

i\_phase=2\*data1(j)-1;*// BPSK modulation of I phase component*

q\_phase=2\*data1(j+1)-1;*//BPSKmodulation of Q phase component*

end

bpsk\_mod=2\*data1-1;*//BPSKModulated signal*

snr=1:10;*//Signal to Noise Ratio*

for k=1:1:length(snr)

noise=1/sqrt(2)\*(10^(-(k/20)))\*(rand(1, length(bpsk\_mod), 'normal')+%i\*(rand(1, length(bpsk\_mod),'normal')));*//White Gaussian Noise generation for BPSK*

rec1\_bpsk= bpsk\_mod+noise;*//BPSK modulated signal over AWGN channel*

rec\_data\_bpsk=[];

for i=1:1:length(data1)*//BPSKDemodulation*

if real(rec1\_bpsk(i))>=0

demod\_out\_bpsk=1;

else real(rec1\_bpsk(i))<0

demod\_out\_bpsk=0;

end

rec\_data\_bpsk=[rec\_data\_bpsk

demod\_out\_bpsk];*//BPSKDemodulated signal*

end

errA=0;errB=0;

for i=1:sym

if rec\_data\_bpsk(i)==data1(i)

errB=errB;

else

errB=errB+1;

end

BER\_bpsk(k)=errB/sym;*//BER of BPSK*

end

end

theoryBer = 0.5\*erfc(sqrt(10.^(snr/10)));

disp(theoryBer); *// Theoritical BER of BPSK*

disp(BER\_bpsk);// experimental BER of BPSK

snr=1:1:10;

plot2d(snr,BER\_bpsk,5,logflag="nl");*//plot simulated BER of BPSK over AWGN channel*

mtlb\_axis([0 20 10^-5 0.5]);*//axis*

xgrid(10);

xtitle( 'Bit Error Rate plot for BPSK Modulation','SNR', 'BER');

