AMPLITUDE MODULATION \_\_\_\_\_\_\_\_\_\_\_\_\_\_

clc ;

clear ;

close ;

fm =3;

fc =20;

fs =100

t =0:1/ fs :3;

p= length (t);

am= input ( ’ Ent e r the me s sage s i g n a l ampl i tude=’ );

ac= input( ’Ent e r the c a r r i e r s i g n a l ampl i tude ( ac>am)=’ );

msg =am\*cos (2\* %pi \*fm\*t);

figure (1);

subplot (3 ,1 ,1);

plot (t,msg);

xlabel ( ’TIME ’ );

ylabel ( ’AMPLITUDE ’ )

title ( ’Mes sage S i g n a l ’ );

carrier =ac\* cos (2\* %pi \*fc\*t);

subplot (3 ,1 ,2);

plot (t, carrier );

xlabel ( ’TIME ’ );

ylabel ( ’AMPLITUDE ’ )

title ( ’ Carrier Signal ’ );

ka =1/ ac;

u=ka\*am;

disp (u, ’The Modulat ion Index i s ’ )

am\_mod =(1+ ka .\* msg ).\* carrier ;

subplot (3 ,1 ,3);

plot (t, am\_mod );

xlabel ( ’TIME ’ );

ylabel ( ’AMPLITUDE ’ )

title ( ’ Amplitude Modulated Signal ’ )

d= (-p /2:1: p/2 -1) \*1/3;

figure (2)

subplot (3 ,1 ,1);

plot (d,abs( fftshift ( fft ( am\_mod ))));

xlabel ( ’FREQUENCY’ );

ylabel ( ’AMPLITUDE ’ )

title ( ’AM S i g n a l Spectrum ’ )

demod = am\_mod .\* carrier ;

k= abs (fft ( demod ));

filt = [ ones (1 ,4\* fm), zeros (1,p -4\* fm) ];

out =k.\* filt ;

subplot (3 ,1 ,3);

plot (t, ifft ( out ));

xlabel ( ’TIME ’ );

ylabel ( ’AMPLITUDE ’ );

title ( ’ Demodulated Message ’ )

FREQUENCY MODULATION \_\_\_\_\_\_’\_\_\_\_’

clc ;

clear ;

close ;

fs =300

t =0:1/fs:2;

p= length (t);

fm= input ( ’ Enter the message signal frequency =’ );

fc= input ( ’ Enter the carrier signal frequency ( f c>>>fm) =’ );

am= input ( ’ Enter the message signal amplitude =’ );

ac= input ( ’ Enter the carrier signal amplitude =’ );

msg =am\*cos (2\* %pi \*fm\*t);

figure (1);

subplot (3 ,1 ,1);

plot (t,msg);

xlabel ( ’TIME ’ );

ylabel ( ’AMPLITUDE ’ )

title ( ’Message Signal ’ );

carrier =ac\* cos (2\* %pi \*fc\*t);

subplot (3 ,1 ,2);

plot (t, carrier );

xlabel ( ’TIME ’ );

ylabel ( ’AMPLITUDE ’ )

title ( ’ Carrier Signal ’ );

kf =4;

mod\_index =( kf\*am)/fm;

disp ( mod\_index , ’The Modulat ion Index i s ’ );

fm\_mod =ac\* cos ((2\* %pi\*fc\*t)+( mod\_index .\* sin (2\* %pi \*fm\*t)));

subplot (3 ,1 ,3);

plot (t, fm\_mod );

xlabel ( ’Time ’ );

ylabel ( ’ Amplitude ’ )

title ( ’ Frequency Modulated Signal ’ );

d=(-p /2:1: p/2 -1) \*1/3;

figure (2)

subplot (3 ,1 ,1);

plot (d,abs( fftshift ( fft ( fm\_mod ))));

xlabel ( ’ Frequency ’ );

ylabel ( ’ Amplitude ’ );

title ( ’FM Signal Spectrum ’ )

DSBSC\_\_\_\_\_\_\_\_\_\_\_\_

clc ;

clear ;

close ;

fs =100

t =0:1/ fs :3;

p= length (t);

fm= input ( ’ Ent e r the me s sage s i g n a l f r e q u e n c y =’ );

fc= input ( ’ Ent e r the c a r r i e r s i g n a l f r e q u e n c y ( f c>>>fm) =’ );

am= input ( ’ Ent e r the me s sage s i g n a l ampl i tude =’ );

ac= input ( ’ Ent e r the c a r r i e r s i g n a l ampl i tude =’ );

// Mes sage S i g n a l Gene r a t i on

msg =am\*cos (2\* %pi \*fm\*t);

figure (1);

subplot (3 ,1 ,1);

plot (t,msg);

xlabel ( ’TIME ’ );

ylabel ( ’AMPLITUDE ’ )

title ( ’Mes sage S i g n a l ’ );

// Ca r r i e r S i g n a l g e n e r a t i o n

carrier =ac\* cos (2\* %pi \*fc\*t);

subplot (3 ,1 ,2);

plot (t, carrier );

xlabel ( ’TIME ’ );

ylabel ( ’AMPLITUDE ’ )

title ( ’ Ca r r i e r S i g n a l ’ );

//DSBSC Modulat ion Gene r a t i on

dsbsc\_mod = msg .\* carrier ;

subplot (3 ,1 ,3);

plot (t, dsbsc\_mod );

xlabel ( ’TIME ’ );

ylabel ( ’AMPLITUDE ’ )

title ( ’ Ampl i tude Modulated S i g n a l ’ )

// Frqeuncy Spectrum

d=(-p /2:1: p/2 -1) \*1/3;

figure (2)

subplot (3 ,1 ,1);

plot (d,abs( fftshift ( fft ( dsbsc\_mod ))));

// FOURIER TRANSFORM OF MODULATED SIGNAL

xlabel ( ’FREQUENCY’ );

ylabel ( ’AMPLITUDE ’ )

title ( ’DSBSC S i g n a l Spectrum ’ )

// Demodulat ion o f DSBSC S i g n a l

demod = dsbsc\_mod .\* carrier ;

k= abs (fft ( demod ));

filt = [ ones (1 ,4\* fm), zeros (1,p -4\* fm) ];

out =k.\* filt ;

subplot (3 ,1 ,3);

plot (t, ifft ( out ));

xlabel ( ’TIME ’ );

ylabel ( ’AMPLITUDE ’ );

title ( ’ Demodulated Mes sage ’ )

// Sample Input s f o r the Program

// Ent e r the me s sage s i g n a l f r e q u e n c y =2

// Ent e r the c a r r i e r s i g n a l f r e q u e n c y ( f c>>>fm) =20

// Ent e r the me s sage s i g n a l ampl i tude =1

// Ent e r the c a r r i e r s i g n a l ampl i tude =2