AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH (AIUB)

Data Communication Laboratory

LAB REPORT

ON

A Message Passing and Receiving Using Modulator

(Part 2: Receiver Side)

Experiment No: 7

Section: [G]

Semester: Spring 20-21

Course Teacher: MD MEHEDI HASAN

Date of Performance: 6-Apr-21

Date of Submission: 13-Apr-21

Student Name: DEBORAJ ROY

Student ID: 19-40158-1

Performance Task for Lab Report:

MY ID = 19-40158-1

A=1, B= 9, C=4, D=0, E=1, F= 5, G= 8, H=1;

(a) Generate a function which will convert a text message into binary bit sequence.

```
% 19-40158-1 DEBORAJ ROY
function dn = asc2bn(txt)
dec=double(txt)
p2=2.^(0:-1:-7)
B=mod(floor(p2'*dec),2)
dn=reshape(B,1,numel(B));
end
```

(b) Generate the carrier signal with the amplitude of AH and frequency of ABCD

```
% 19-40158-1 DEBORAJ ROY

clc;
clear all;
close all;
A1=11; % Amplitude of carrier signal AH=11
f=1940; % carrier frequency ABCD=1940
bp=1/f;
t=0:bp/100:20*bp;
y=A1*cos(2*pi*f*t);%subplot(4,1,2);
plot(t,y);
grid on;
xlabel('time(sec)');
ylabel('amplitude(volt)');
title('Carrier Signal');
```
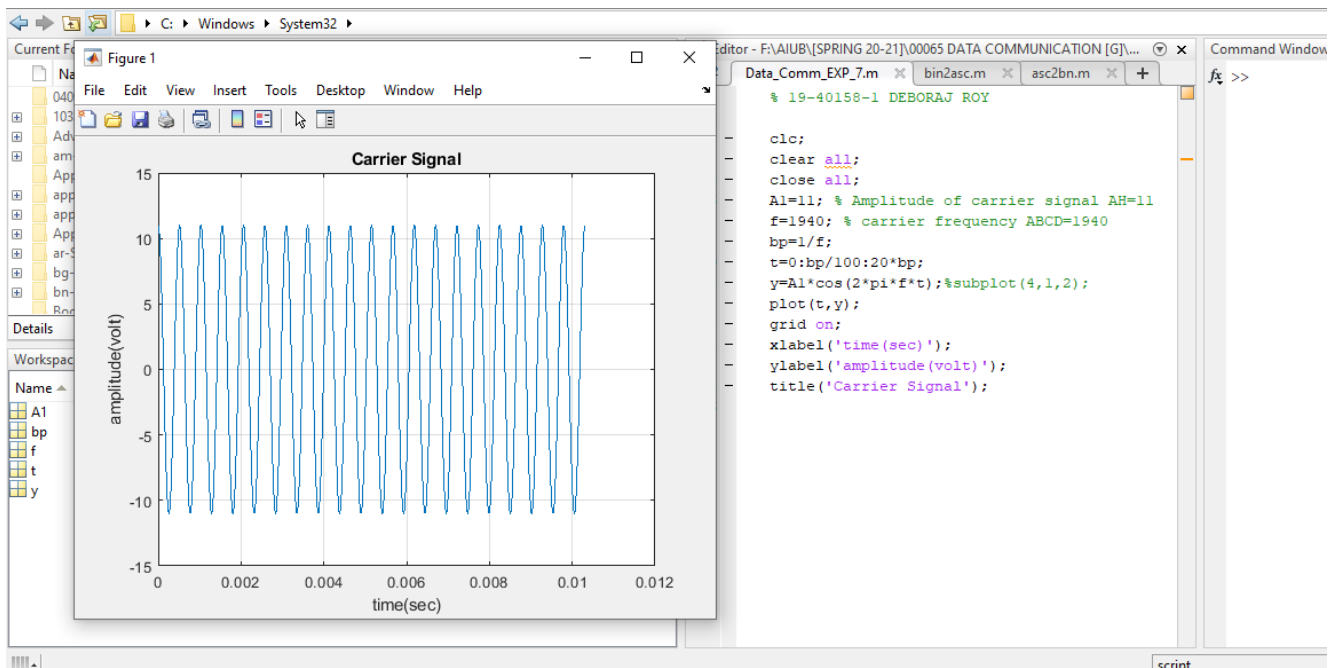
(c)   Perform PSK and QPSK modulation.

PSK Modulation:

```
% 19-40158-1 DEBORAJ ROY

Transmitted_Message= 'DEBORAJ'
x=asc2bn(Transmitted_Message); % Binary Information
bp=.000001; % bit period
disp(' Binary information at Trans mitter :');
disp(x);
bit=[];
for n=1:1:length(x)
if x(n)==1;
se=5*ones(1,100);
else x(n)==0;
se=zeros(1,100);
end
bit=[bit se];
end
```
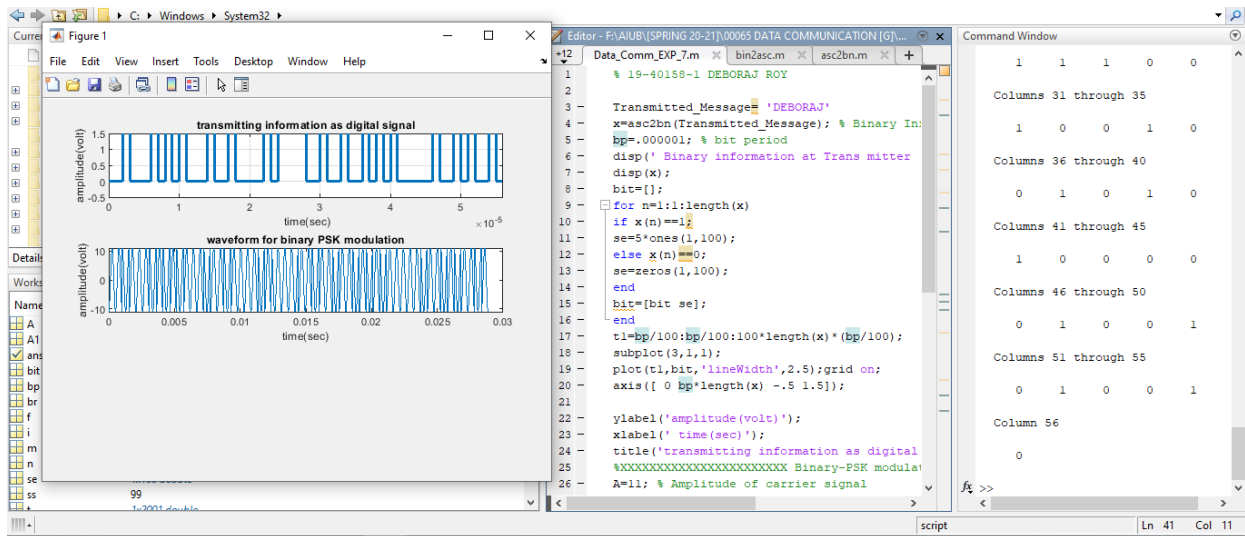
```matlab
t1=bp/100:bp/100:100*length(x)*(bp/100);
subplot(3,1,1);
plot(t1,bit,'lineWidth',2.5);grid on;
axis([ 0 bp*length(x) -.5 1.5]);

ylabel('amplitude(volt)');
xlabel(' time(sec)');
title('transmitting information as digital signal');
%XXXXXXXXXXXXXXXXXXXXXXXX Binary-PSK modulation
XXXXXXXXXXXXXXXXXXXXXXXXXXXX%
A=11; % Amplitude of carrier signal
f=1940; % carrier frequency
br=1/bp; % bit rate
bp=1/f;
t2=bp/99:bp/99:bp;
ss=length(t2);
m=[];
for (i=1:1:length(x))
if (x(i)==1)
y=A*cos(2*pi*f*t2);
else
y=A*cos(2*pi*f*t2+pi); %A*cos(2*pi*f*t+pi) means -A*cos(2*pi*f*t)
end
m=[m y];
end
t2=bp/99:bp/99:bp;
grid on;
t3=bp/99:bp/99:bp*length(x);
subplot(3,1,2);
plot(t3,m);
xlabel('time(sec)');

ylabel('amplitude(volt)');
title('waveform for binary PSK modulation');
```

QPSK Modulation:

% 19-40158-1 DEBORAJ ROY

```
clc
Transmitted_Message= 'DEBORAJ'
x=asc2bn(Transmitted_Message); % Binary Information

bp=.000001; % bit period
disp(' Binary information at Trans mitter :');
disp(x); % input signal x= [0010100011111010000100001000011111000001] input
signal%
x1=[01101111000000011000];
x2=[00001100010010011001];
bit=[];
for n=1:1:length(x)
if x(n)==1;
se=5*ones(1,100);
else x(n)=0;
se=zeros(1,100);
end
bit=[bit se];
end
t1=bp/100:bp/100:100*length(x)*(bp/100);

subplot(5,1,1);
plot(t1,bit,'lineWidth',2.5);grid on;
axis([ 0 bp*length(x) -.5 6]);
ylabel('amplitude(volt)');
xlabel(' time(sec)');
title('Transmitting information as digital signal');
A1=11; % Amplitude of carrier signal for information 1
f=1940; % carrier frequency
bp=1/f;
t2=bp/99:bp/99:bp;
```

```matlab
t=0:bp/100:35*bp;
y=A1*cos(2*pi*f*t);
subplot(5,1,2);
plot(t,y);
grid on;
xlabel('time(sec)');
ylabel('amplitude(volt)');
title('Carrier Signal');
nx=size(x1,2);
i=1;
while i<nx+1
t2 = i:0.001:i+1;
if (x1(i)==1)
y=A1*cos(2*pi*f*t2);
else
y=A1*cos(2*pi*f*t2+pi);
end
if (x2(i)==1)
y1=A1*cos(2*pi*f*t2+pi/2);
else
y1=A1*cos(2*pi*f*t2+pi+pi/2);
end
QPSK =y+y1;
subplot(5,1,3);
plot(t2,y);
grid on;
xlabel('time(sec)');
ylabel('amplitude(volt)');
title('PSK1 Modulated Signal');
subplot(5,1,4);
plot(t2,y1);
grid on;
xlabel('time(sec)');
ylabel('amplitude(volt)');
title('PSK2 Modulated Signal');
subplot(5,1,5);
plot(t2,QPSK);
grid on;
%axis([ 0 bp*length(x2) -0.9 0.9]);grid on;
xlabel('time(sec)');
ylabel('amplitude(volt)');
title('QPSK Modulated Signal');
i=i+1;
end
```

Figure 1

File Edit View Insert Tools Desktop Window Help

Transmitting information as digital signal

Carrier Signal

PSK1 Modulated Signal

PSK2 Modulated Signal

QPSK Modulated Signal

QPSK   1x1001 double
se   1x100 double

Editor - F:\AIUB\[SPRING 20-21]\00065 DATA COMMUNICATION [G]\...

Data_Comm_EXP_7.m   bin2asc.m   asc2bn.m   +

```
1      % 19-40158-1 DEBORAJ ROY
2
3 -    clc
4 -    Transmitted_Message= 'DEBORAJ'
5 -    x=asc2bn(Transmitted_Message); % Binary In:
6
7 -    bp=.000001; % bit period
8 -    disp(' Binary information at Trans mitter
9 -    disp(x); % input signal x= [00101000111110.
10 -   x1=[01101111000000011000];
11 -   x2=[00001100010010011001];
12 -   bit=[];
13 -   for n=1:1:length(x)
14 -   if x(n)==1;
15 -   se=5*ones(1,100);
16 -   else x(n)=0;
17 -   se=zeros(1,100);
18 -   end
19 -   bit=[bit se];
20 -   end
21 -   t1=bp/100:bp/100:100*length(x)*(bp/100);
22
23 -   subplot(5,1,1);
24 -   plot(t1,bit,'lineWidth',2.5);grid on;
25 -   axis([ 0 bp*length(x) -.5 6]);
26 -   ylabel('amplitude(volt)');
```

Command Window

```
         1       1       1       0       0

Columns 31 through 35

         1       0       0       1       0

Columns 36 through 40

         0       1       0       1       0

Columns 41 through 45

         1       0       0       0       0

Columns 46 through 50

         0       1       0       0       1

Columns 51 through 55

         0       1       0       0       1

Column 56

         0

fx >>
```

script   Ln 63   Col 8