Final-term Lab Assessment Task

Submitted By:		
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Parameters:

-Consider, your ID = **AB-CDEFG-H. =>20-42277-1**

[please use any random value if assigned value comes out zero]

VAL1 = EFG*100	**VAL2** = GH*10
27700	**710**

Problem Statement:

Suppose, you want to send a message which contains your FIRST MEMBER NAME. Develop a MATLAB code to show the transmission process to send the information from SENDER to RECEIVER. Available frequency ranges for the transmission: 1.8 - 2.5 GHz

Hint:

1. Encode the message.
2. Convert binary bit stream from parallel to serial transmission.
3. Convert data to signal using at least **27700** sample data.
4. Now, modulate the digital signal (using any Digital to Analog Conversion except BASK) to send via a transmission channel.
5. The signal to noise ratio of the channel is **710**.
6. Demodulate the received signal.
7. Convert the binary data to retrieve the message.

Instructions:

1. Task can be submitted individually or in Group (not more than 4 person)
2. **For Group Submission:** You can use one of the group member ID for parameter calculation. Anyone from the group can submit the task (no need of multiple submission)
3. Plagiarism is strictly prohibited.
4. Please use MATLAB software to accomplish the project.
5. Use this file as Cover Page.
6. In your submission file, you must add three sections: Cover page, Code & Output.
7. Finally submit it in PDF format.

MATLAB Code:

1. ASCII to Binary Converter Function:

```
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
```

2. Binary to ASCII Converter Function:

```
function txt = bin2asc(dn)
L8=8*floor(L/8);
B=reshape(dn(1:L8),8,L8/8);
 p2=2.^(0:7);

dec=p2*B
 txt=char(dec);
end
```

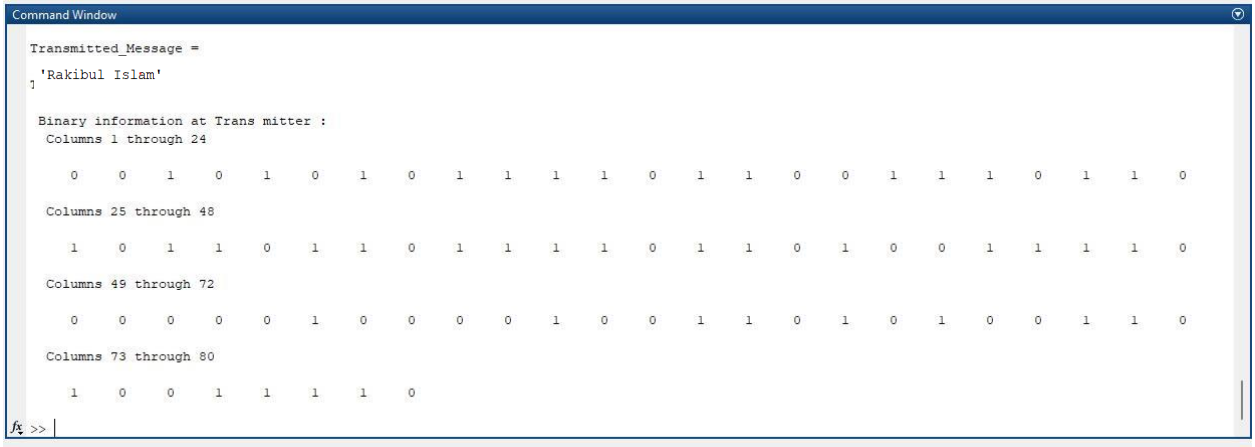
Message Sending using QPSK Modulation and Demodulation:

```
clc;
clear all;
close all;
Transmitted_Message= 'Rakibul Islam'
x=asc2bn(Transmitted_Message);
bp=.0000001; disp(' Binary information at
Transmitter :'); 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
t1=bp/106:bp/106:100*length(x)*(bp/106);
subplot(4,1,1);
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');
```

```
data_NZR=2*x-1;

s_p_data=reshape(data_NZR,2,length(x)/2)
; br=10.^6;
1000000
f=br;
T=1/br;
t=T/25700:T/27700:T;
y=[];
y_in=[];
y_qd=[];
for(i=1:length(x)/2)
    y1=s_p_data(1,i)*cos(2*pi*f*t);
    y2=s_p_data(2,i)*sin(2*pi*f*t) ;
    y_in=[y_in y1];
    y_qd=[y_qd y2];
    y=[y y1+y2];
end
Tx_sig=y;
tt=T/27700:T/27700:(T*length(x))/2;

Rec=awgn(Tx_sig,710);
subplot(4,1,2);
plot(tt,Tx_sig,'g','linewidth',1.5),
grid on;
title('QPSK modulated signal');
xlabel('time(sec)');
ylabel('amplitude(volt)');
subplot(4,1,3);
plot(tt,Rec,'r','linewidth',2.5),
grid on;
title('QPSK modulated signal at Receiver');
xlabel('time(sec)');
ylabel('amplitude(volt)');

disp(' Message transmitted through a Transmission medium');


Rx_data=[];
Rx_sig=Tx_sig;
for(i=1:1:length(x)/2)
    Z_in=Rx_sig((i-1)*length(t)+1:i*length(t)).*cos(2*pi*f*t);

    Z_in_intg=(trapz(t,Z_in))*(2/T);
    if(Z_in_intg>0)
        Rx_in_data=1;
    else
       Rx_in_data=0;
    end
    Z_qd=Rx_sig((i-1)*length(t)+1:i*length(t)).*sin(2*pi*f*t);
```

```
Z_qd_intg=(trapz(t,Z_qd))*(2/T);
     if (Z_qd_intg>0)
         Rx_qd _data=1;
         else
        Rx_qd _data=0;
         end
 Rx_data=[Rx_data
 Rx_in_data
Rx_qd_data];
 End
 g
 disp(' Binary information at Reciver :');
 disp(Rx_ data);
 bit=[];
 for n=1:length(Rx_data);
  if Rx_data(n)==1;
  se=5*ones(1,100);
  else Rx_data(n)==0;
  se=zeros(1,100);
  end
  bit=[bit se];
 end
 t5=bp/106:bp/106:100*length(Rx_data)*(bp/106);
 subplot(4,1,4);
 plot(t5,bit,'LineWidth',2.5);
 grid on;
 axis([ 0 bp*length(Rx_data) -.5 6]);
 ylabel('amplitude(volt)');
 xlabel(' time(sec)');
 title('Demodulated signal at Receiver');
 Received_Message=bin2asc(Rx_data)
```

Output:



OUTPUT SIGNAL: