**% Experiment-3 sample code:**

clc;

clear;

fs = 40e3;

fc = 4e3;

t = 0:1/fs:0.001;

x = 0.5\*sin(2\*pi\*fc\*t);

% Quantization

n=100;

L=(2^n)-1;

delta=(max(x)-min(x))/L;

xq=min(x)+(round((x-min(x))/delta)).\*delta;

%Quantization error

er=abs(x-xq);

% Plot

subplot(4,1,1)

plot(t,x,'R');

title('Analog signal')

xlabel('time')

ylabel('amplitude')

subplot(4,1,2);

stem(t,x,'b');

xlabel('time(s)')

ylabel('X[n]')

subplot(4,1,3);

stairs(t,xq,'b');

title('Quantized Signal')

xlabel('time')

ylabel('amplitude')

subplot(4,1,4);

plot(t,er,'b');

title('quantization error')

xlabel('time')

ylabel('error')

**Lab report task for experiment 3:**

ID: AB-CDEFG-H

Write a MATLAB code that can generate an approximated quantized signal for the following analog function:

1. Define the amplitude , sampling frequency, define the time domain for function that gives at least 3 complete cycles.
2. Define the number of quantization levels, step size or resolution, then find the quantized signal .
3. Obtain the absolute quantization error, )
4. Finally, use 2x2 subplot to plot analog signal , sampling signal of , quantized signal , and quantized error signal .