

**American International University- Bangladesh**

**COE 3103: DATA COMMUNICATION**

**Mid Lab Report 02**

**Spring 2021-2022**

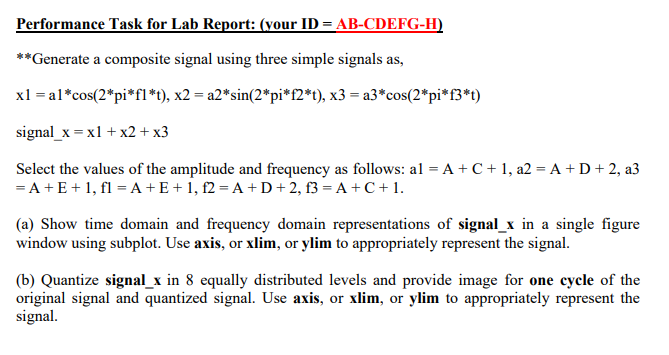
**Section: Q**

**Date: 17/02/2022**

**Submitted by,**

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**Tasks:**



**Solution:**

%ID: 19-41468-3

A = 1;

B = 9;

C = 4;

D = 1;

E = 4;

F = 6;

G = 8;

H = 3;

a1 = A+C+1;

a2 = A+D+2;

a3 = A+E+1;

f1 = A+E+1;

f2 = A+D+2;

f3 = A+C+1;

fs = 1000;

t = 0:1/fs:1;

x1 = a1\*cos(2\*pi\*f1\*t);

x2 = a2\*sin(2\*pi\*f2\*t);

x3 = a3\*cos(2\*pi\*f3\*t);

signal\_x = x1+x2+x3;

%solution of (a)

figure

subplot(2,1,1)

plot(t,signal\_x) %output in figure 1

axis([0 1 -20 20])

title('Time-Domain Representation of signal x');

xlabel('Time (s)');

ylabel('Amplitude');

fx = abs(fftshift(fft(signal\_x)))/(length(signal\_x)/2);

freq = linspace(-fs/2, fs/2, length(signal\_x));

subplot(2,1,2)

bar(freq, fx,'linewidth',3) %output in figure 1

axis([-10 10 0 15])

title('Frequency-Domain Representation of signal x')

xlabel('Frequency (Hz)')

ylabel('Amplitude')

%solution of (b)

figure

p = linspace(-14,14,7);

c = linspace(-15.53,15.53,8);

[i,q] = quantiz(signal\_x,p,c);

plot(t,signal\_x,'x',t,q,'.') %output in figure 2

axis([0 0.5 -16 16])

title('Quantization of signal x');

legend('Original signal','Quantized signal');

xlabel('Time (s)');

ylabel('Amplitude');

**Figures:**

