Analog Signal quantization using MATLAB

Report 3

DATA COMMUNICATION [D]

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CODE :

```
%AB-CDEFG-H
%20-42595-1
A1=52;
CDE = 425;
fs=40000;
t=0:1/fs:1-1/fs;
x1=A1*cos(2*pi*(CDE*100)*t);
n=4; % given
L=(2^n)-1
```

Output:

```
>> Ans_1

L =

    15
```

CODE:

```
%AB-CDEFG-H
%20-42595-1
A1=52;
CDE = 425;
fs=40000;
t=0:1/fs:1-1/fs;
x1=A1*cos(2*pi*(CDE*100)*t);
n=4;
L=(2^n)-1;
delta= (max(x1)-min(x1))/L
```

OUTPUT:

```
>> Ans_2

delta =

    6.9333
```

CODE:

```
%AB-CDEFG-H
%20-42595-1
A1=52;
CDE = 425;
fs=40000;
t=0:1/fs:1-1/fs;
x1=A1*cos(2*pi*(CDE*100)*t);
n=4;
x=3.2;
L=(2^n)-1;
delta= (max(x1)-min(x1))/L;
i=round((x-min(x1))/delta);
Xq=min(x1)+i.*delta
```

OUTPUT:

```
>> Ans_3

Xq =

    3.4667
```

CODE:

```
%AB-CDEFG-H
%20-42595-1
A1=52;
CDE = 425;
fs=20000;
t=0:1/fs:0.003;
x1=A1*cos(2*pi*(CDE*100)*t);
n=4;
L=(2^n)-1;
delta= (max(x1)-min(x1))/L;
i=round((x1-min(x1))/delta);
xq=min(x1)+(i.*delta);
subplot(3,1,1)
plot(t,x1,'R');
xlabel('Time')
ylabel('X[n]')
subplot(3,1,2)
stem(t,x1,'b')
```

```
xlabel('Time')
ylabel('X[n]')
subplot(3,1,3)
stairs(t,xq,'b');
title('Quantized Signal')
xlabel('Time')
ylabel('Amplitude')
```

OUTPUT: