



American International University-Bangladesh (AIUB)

Faculty of Engineering

COE 3101: Data Communication Mid Term Lab Assignment Question Paper

Instructions:

- **MATLAB** must be used to complete the assignment.
- This assignment must be submitted online as a **PDF** file on **VUES** under the component named '**MT LAB ASSIGNMENT**'.
- The file name must be '**MT LAB ASSIGNMENT ID.pdf**', where **ID** is your ID. For example, the file name can be **MT LAB ASSIGNMENT 19-34567-2.pdf**.
- On cover page of this assignment, **NAME**, **ID**, and **SECTION** must be mentioned clearly.
- **ID** related calculations must be presented clearly.
- Total grade is **10**.
- **Plagiarism will be penalized.**
- **Deadline: 19/10/2021 (Tuesday) 10:00 PM.**

Questions:

Assume your ID is AB-CDEFG-H . Following variable values are based on your ID :
a1 = G+2
a2 = G+6
a3 = G+4
a4 = G+8
f1 = G+5
f2 = G+3
f3 = G+9
f4 = G+7
If, G is 1 or 3 or 7 , then L = 10
If, G is 0 or 5 or 8 , then L = 8
If, G is 2 or 4 or 6 or 9 , then L = 12

1. Generate a simple signal (**sig_st**) and a composite signal (**sig_ct**) in time domain and apply frequency analysis on these signals using **fft()**.
sig_st = a1*sin(2*pi*f1*t)
sig_ct = a1*sin(2*pi*f1*t) + a2*cos(2*pi*f2*t) + a3*cos(2*pi*f3*t) + a4*sin(2*pi*f4*t)
Insert the code as text and attach four figures of the two signals and two spectrums separately. You **must** use **axis()**, so that the figures are **interpretable**. **Label** and **title** are mandatory. (5)
2. Apply **uniform quantization** on **sig_ct** using **quantiz()**. Use **L** number of levels for quantization. The quantized levels must be in the midpoint of each of the quantization ranges. Show one full cycle of both **sig_ct** and the **quantized signal** in a single figure window in time domain. Insert the code as text and attach one figure. **Legend**, **label**, and **title** are mandatory. Use '*' for **sig_ct** and 'x' for the **quantized signal**. Use such a sampling frequency value so that the points of **sig_ct** and the quantized signal are visible clearly and comfortably. (5)