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 this assignment.
- This assignment must be submitted online as a **PDF** file on **VUES** under the component named '**MID LAB ASSIGNMENT SUBMISSION**'.
- The file name must be '**YOUR_ID MID LAB ASSIGNMENT.pdf**', where **YOUR_ID** is your ID. For example, the file name can be **19-34567-2 MID LAB ASSIGNMENT.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: 19/03/2021 (Saturday) 10:00 PM.**
- **Late submission will result into 50% grade penalty.**

Questions:

Assume your **ID** is **AB-CDEFG-H**. Following **variable** values are based on your **ID**:
a1 = G+2
a2 = G+1
f1 = G+4
f2 = G+6

$$\text{sig\_ct = a1*sin(2*pi*f1*t) + a2*cos(2*pi*f2*t)}$$

1. Apply **uniform quantization** of **8** levels on **sig_ct** using Matlab built in function **quantiz**(). The quantized levels must be in the midpoint of each of the quantization ranges. Show approximately one full cycle of both **sig_ct** and the **quantized signal** in a single figure window in time domain. In the report, insert the code as text and attach the figure. **Legend, labels**, and **title** are mandatory. Use '*' marker for **sig_ct** and 'x' marker 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**)

2. Apply **uniform quantization** of **4** levels on **sig_ct** **not using** Matlab built in function **quantiz**(). The quantized levels must be in the midpoint of each of the quantization ranges. Show approximately one full cycle of both **sig_ct** and the **quantized signal** in a single figure window in time domain. In the report, insert the code as text and attach the figure. **Legend, labels**, and **title** are mandatory. Use '*' marker for **sig_ct** and 'x' marker 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**)