



American International University-Bangladesh (AIUB) Faculty of Engineering

COE 3101: Data Communication Final 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 '**FINAL TERM LAB ASSIGNMENT SUBMISSION**'.
- The file name must be '**YOUR_ID FINAL TERM LAB ASSIGNMENT.pdf**', where **YOUR_ID** is your ID. For example, the file name can be **20-34567-3 FINAL TERM 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: 21/04/2021 (Thursday) 10:00 PM.**

Questions:

Assume your **ID** is **AB-CDEFG-H**.

Form a string of four characters, by taking any two letters and any two numbers of your choice. For example, your string can be '**6Lm7**' or '**4pT9**' or '**U8q7**'. Do not use any string from these examples. This is your text message. In this assignment you must show how we can transmit a text message and how we can recover the text message again at receiver.

- Convert your text message into binary bit sequence.
- Display the bit sequence from (a) as four level unipolar digital signal. Use **0** volt for binary '**0 0**', use **(G+5)** volt for binary '**0 1**', use **2*(G+5)** volt for binary '**1 0**', use **3*(G+5)** volt for binary '**1 1**'. Bit rate of your digital signal must be **(G+1)*10** bps.
- Apply QASK on digital signal from (b). Use a carrier frequency of **(G+1)*40** Hz. Assume we are transmitting this analog signal.
- Add noise to your modulated signal and assume that the noisy signal is your received signal.
- Recover the bit sequence from the received noisy signal.
- Display the recovered bit sequence from (e) as four level unipolar digital signal. Use **0** volt for binary '**0 0**', use **(G+5)** volt for binary '**0 1**', use **2*(G+5)** volt for binary '**1 0**', use **3*(G+5)** volt for binary '**1 1**'. Bit rate of your digital signal must be **(G+1)*10** bps.
- Regenerate your text message from recovered bit sequence of (e).
- Increase and decrease noise power at step (d) to analyze its impact on communication quality. What is your observation about impact of noise?

***** All codes must be inserted as text in the report.**