



American International University-Bangladesh (AIUB)

Faculty of Engineering

COE 3101: Data Communication Final Term Lab Examination Question Paper

Instructions:

- **MATLAB** must be used for simulation.
- The answer script must be submitted online as a **PDF** file on **VUES** under the component named '**FINAL TERM LAB EXAM SUBMISSION**'.
- The file name must be '**FINAL TERM LAB EXAM ID.pdf**', where **ID** is your ID. For example, the file name can be **FINAL TERM LAB EXAM 19-34567-2.pdf**.
- On cover page of the answer script, **NAME**, **ID**, and **SECTION** must be mentioned clearly.
- **ID** related calculations must be presented clearly.
- Total grade is **10**.
- **Plagiarism will result into 'F' grade.**
- **Deadline: 30/11/2021 (Tuesday) 10:40 AM.**

Question:

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

$$s1 = a1 \cdot \cos(2 \cdot \pi \cdot f1 \cdot t); [a1 = F+4, f1 = G+3]$$

$$s2 = a2 \cdot \cos(2 \cdot \pi \cdot f2 \cdot t); [a2 = F+2, f2 = G+5]$$

$$s3 = a3 \cdot \cos(2 \cdot \pi \cdot f3 \cdot t); [a3 = F+3, f3 = G+4]$$

- Apply frequency division multiplexing (**FDM**) to combine analog signals **s1**, **s2** and **s3** where available frequency range for transmission is **(G+1)*90 Hz** to **(G+1)*160 Hz**.
- Assume the multiplexed signal from (a) was transmitted. Recover original analog signals from the received signal.

Use suitable values for other necessary parameters.

In your answer script you must add your code as text (no screenshot of MATLAB code is acceptable). Use **axis()**, **xlim()**, **ylim()** functions appropriately to show your output results in understandable manner.

Output figures must include: (i) **s1**, **s2** and **s3** in time domain, (ii) **s1**, **s2** and **s3** in frequency domain, (iii) multiplexed signal in both time and frequency domain, (iv) recovered signals in time domain, and (v) recovered signals in frequency domain.