CSE320 - Assignment 03
Deadline: August 18, 2023, 11:59 PM

1. Assume that a voice channel occupies a bandwidth of (**use last two digits of your student ID, for 17201314 it will be 14 KHz**) kHz. We need to multiplex 20 voice channels with guard bands of 500 Hz using FDM. **Calculate** the required bandwidth.
2. **Differentiate** between statistical TDM and synchronous TDM? **Why** is the synchronization bit required in TDM?
3. Consider there are five channels, two with a bit rate of 400 kbps and three with a bit rate of 200 kbps are to be multiplexed using multiple-slot TDM with one synchronization bit.
    a. How many input channels are there after doing multi-slot TDM?
    b. What is the input bit duration before multiplexing?
    c. What is the size of a frame in bits?
    d. What is the frame rate?
    e. What is the duration of a frame?
    f. What is the data rate?
    g. What is output slot duration?
    h. What is the output bit duration?
4. Show using diagram the contents of the six output frames for a synchronous TDM multiplexer that combines four sources sending one character in each input slot. **The third source is silent.**
    a. Source 1 message: SECTOR
    b. Source 2 message: DATA
    c. Source 3 message:
    d. Source 4 message: CSE

➔ Now, **show** the diagram for statistical TDM. Mention the **difference** between two multiplexers.

5. Show the staircase in the following graph and generate the digital data from the given analog signal using the Delta Modulation (DM) technique. [**Practice only, no need to submit**]