Lab Assignment 7, EE304P

General Instructions

1. Submit a zip file of size less than 10 Mb per lab assignment on moodle. Name the zip file as your *'roll no.Assignment number.name'*, i.e., $B1234.LA7.AsimRana.zip$.

2. The zip file must contain a folder with a PDF file and four Matlab m-files, i.e., a separate m-file for each part.

3. In the PDF file paste the simulated figures (not the Matlab code) and write the inference/s drawn from each part of the question. Name the PDF file as your *'roll no.Assignment number.name'*, i.e., $B1234.LA7.AsimRana.pdf$.

4. Each m-file upon execution must produce the exact figure/s as used in the pdf file. Name the m-files of each part as LA7_Q1a.m, LA7_Q1b.m, and LA7_Q1c.m.

5. **Due date: 11:55 PM, 24/04/2021**. Submit only on moodle.

6. Instructions to download and install: Matlab r2019, Matlab r2020a, or use Matlab online.

7. Use only the general commands/functions of Matlab. Hence, do not use special functions/commands from a toolbox. Drop me an email in case of any confusion.

8. **Adhere to the above instructions and facilitate a fair evaluation, dishonesty will result in a penalty.**

Lab Assignment Question

1. Construct a message/baseband signal $g(t)$ with two sinusoidal components of 1 second duration with frequencies are 1 Hz and 3 Hz, i.e., $g(t) = \sin(2\pi t) - \sin(6\pi t)$. Note, however, that when the signal duration is infinite, the bandwidth of $g(t)$ would be 3 Hz. Write Matlab codes for the following parts and label each figure.

   (a) Mention $g(t)$ and plot a figure having the message signal $g(t)$ in time domain and frequency domain (two sub-figures). State your observations.

   (b) Let the signal $g_s(kT_s)$ be obtained by multiplied the message signal and an impulse train of frequency $f_s = 50$ Hz. Plot a figure with signals $g(t)$ and $g_s(kT_s)$. State your observations.

   (c) Let the amplitude of the signal $g_s(kT_s)$ be approximated as the midpoint of the 16 discrete levels, obtained by uniformly dividing the peak-to-peak range of the message signal, to obtain $\hat{g}[kT_s]$. Plot a figure having the signals $g(t)$ and $\hat{g}[kT_s]$. State your inferences and the difference between the two signals.