CSE3132 (Digital Signal Processing Lab)

Assignment: Sampling and Quantization, Convolution, Moving Average, Auto-Correlation, Correlation

1. **Illustration of Sampling & Quantization**
   a. Write a Matlab program for generating a composite signal (you could use sine or cosine waves). The parameters including the signal frequencies of 4 KHz, 8 KHz, 16 KHz with the amplitudes of 10 dB, 20 dB, 40 dB respectively, and the signal length should be limited to 1000 in samples.
   b. Plot the generated signal.
   c. Do standard sampling by following the Nyquist rate.
   d. Perform under sampling and over sampling too. Use Subplot function to show the original, sampled, under sampled, and over sampled signal.
   e. Then perform quantization and plot the quantized signal along with quantization error (use standard sampled signal).
   f. Perform quantization for different bit levels say, n=2, 4, 8, 16 and plot the quantization error in Matlab for all cases.

2. **Illustration of Moving Average**
   a. Write a Matlab program for generating a signal with the signal frequency of 4 KHz and