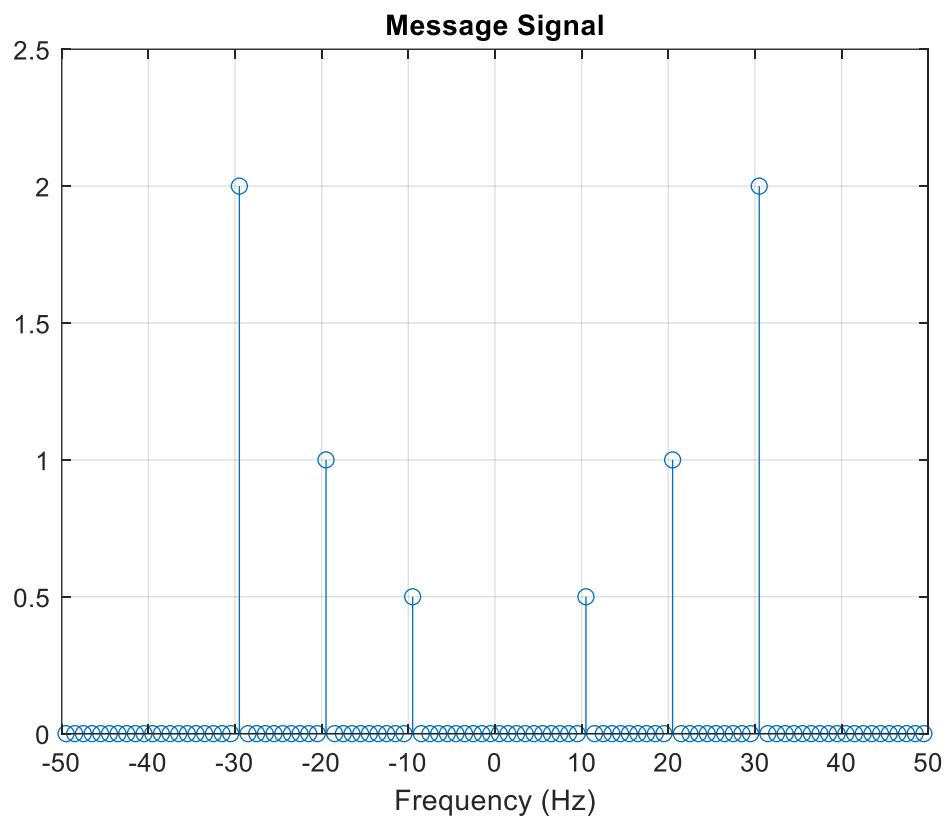
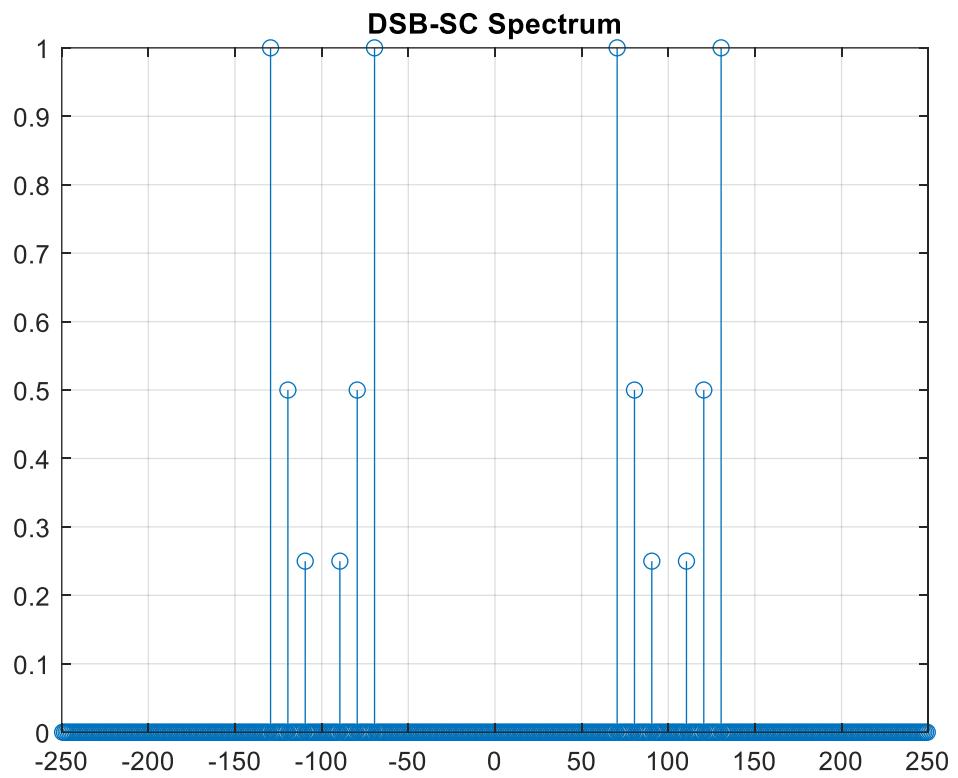


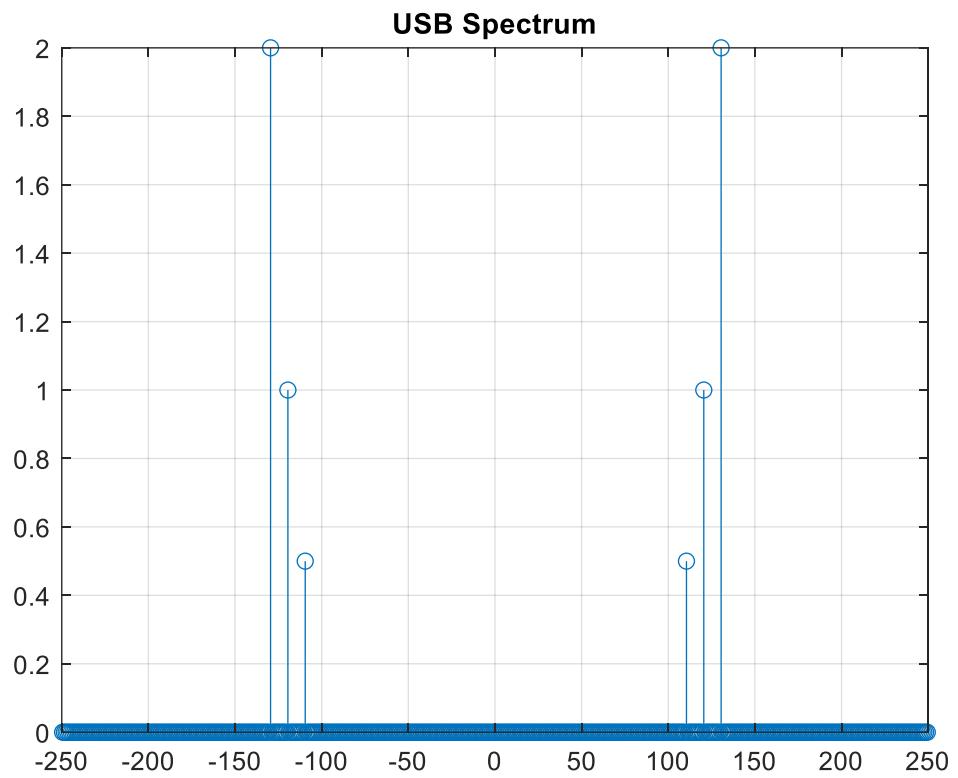
Q1



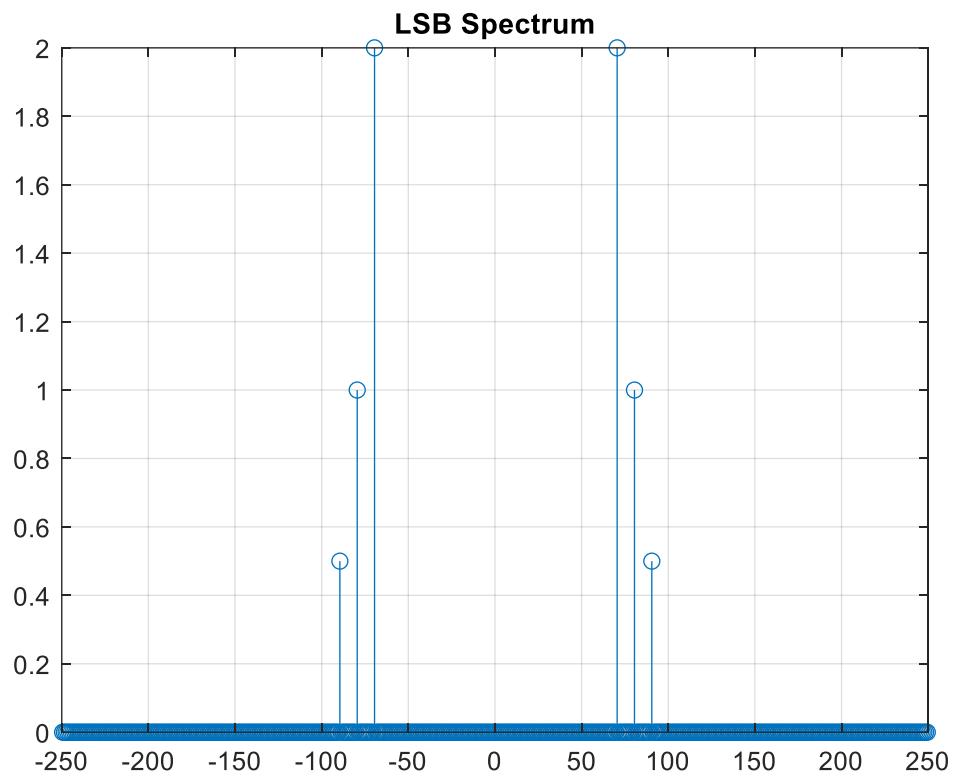
*Figure 1 – Message Signal Spectrum (10 Hz, 20 Hz and 30 Hz)*



*Figure 2 – DSB-SC Spectrum of Message Signal (100 Hz)*



*Figure 3 - USB Spectrum of Message Signal (100 Hz)*



*Figure 4 - LSB Spectrum of Message Signal (100 Hz)*

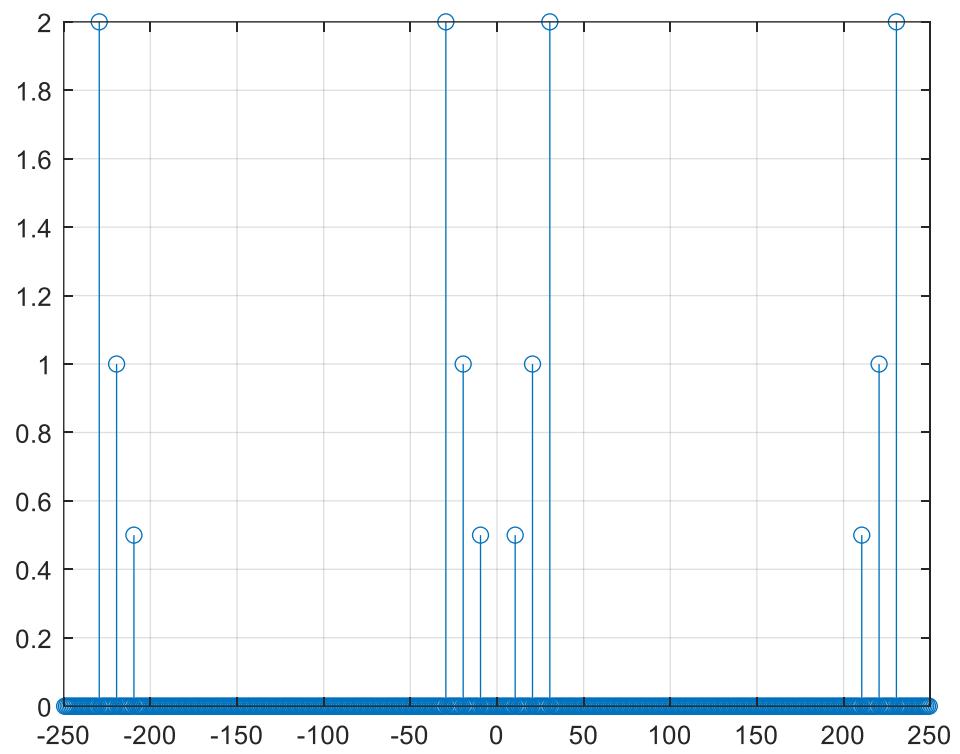


Figure 5 - USB Spectrum of Message Signal before Low Pass Filter

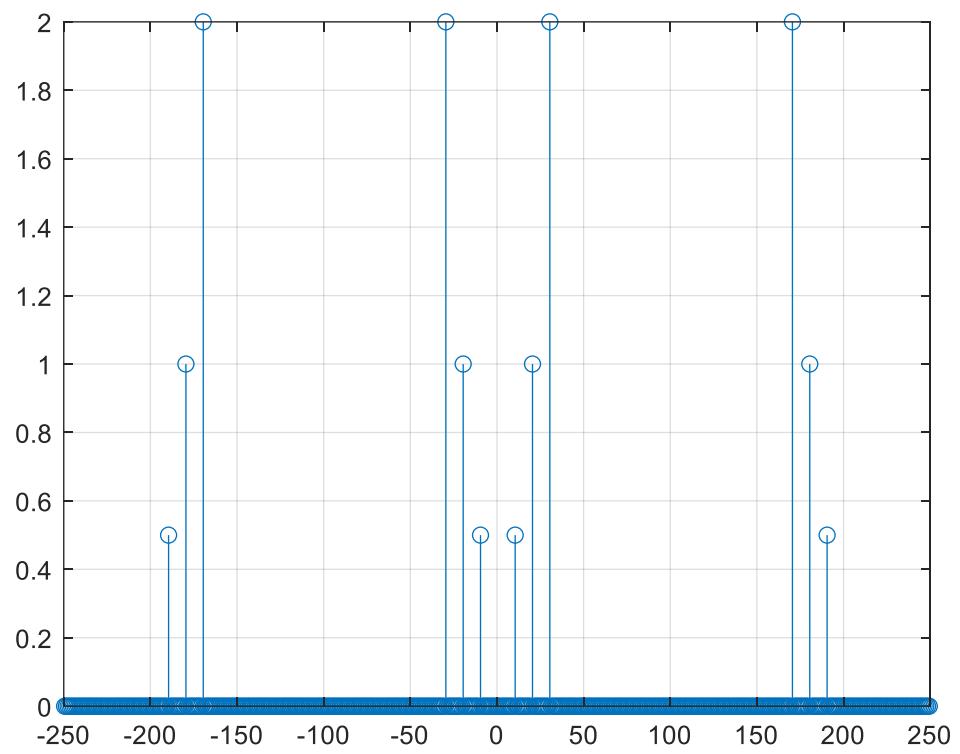
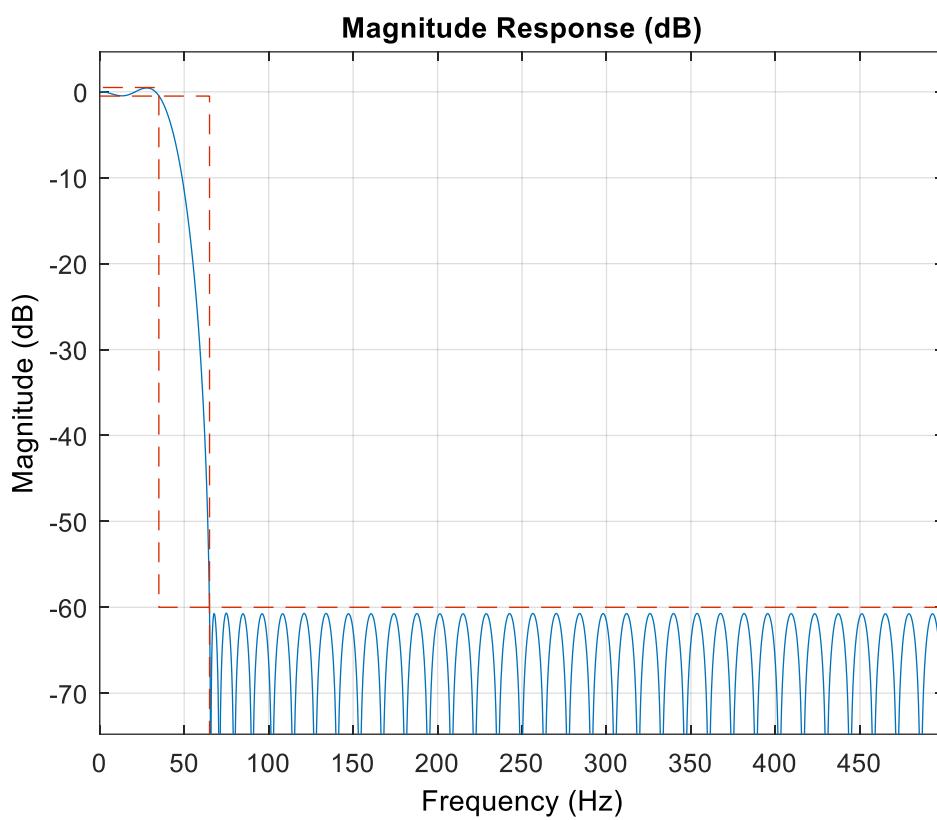
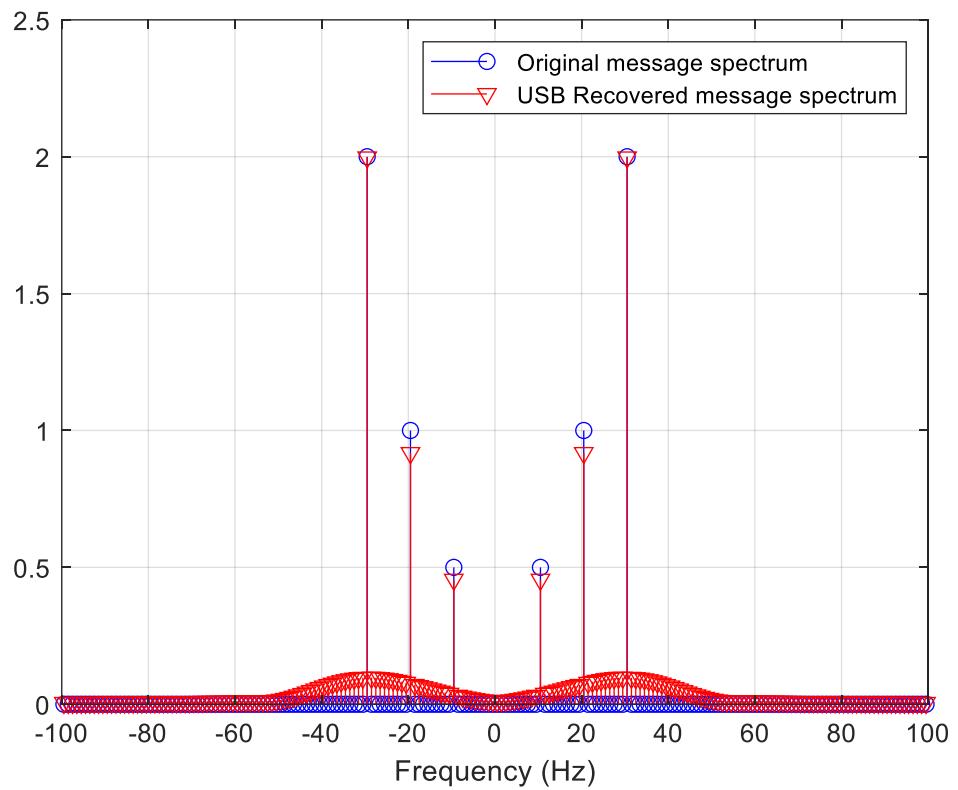


Figure 6 - LSB Spectrum of Message Signal before Low Pass Filter



*Figure 7 - Low Pass Filter*



*Figure 8 – USB Recovered Message Signal after Low Pass Filter*

After passing through the low pass filter (with a cutoff of 35 and a stop at 65), our signal ultimately returns to the frequency values of our original signal. Thus, we can state that our signal has been preserved during the transfer.

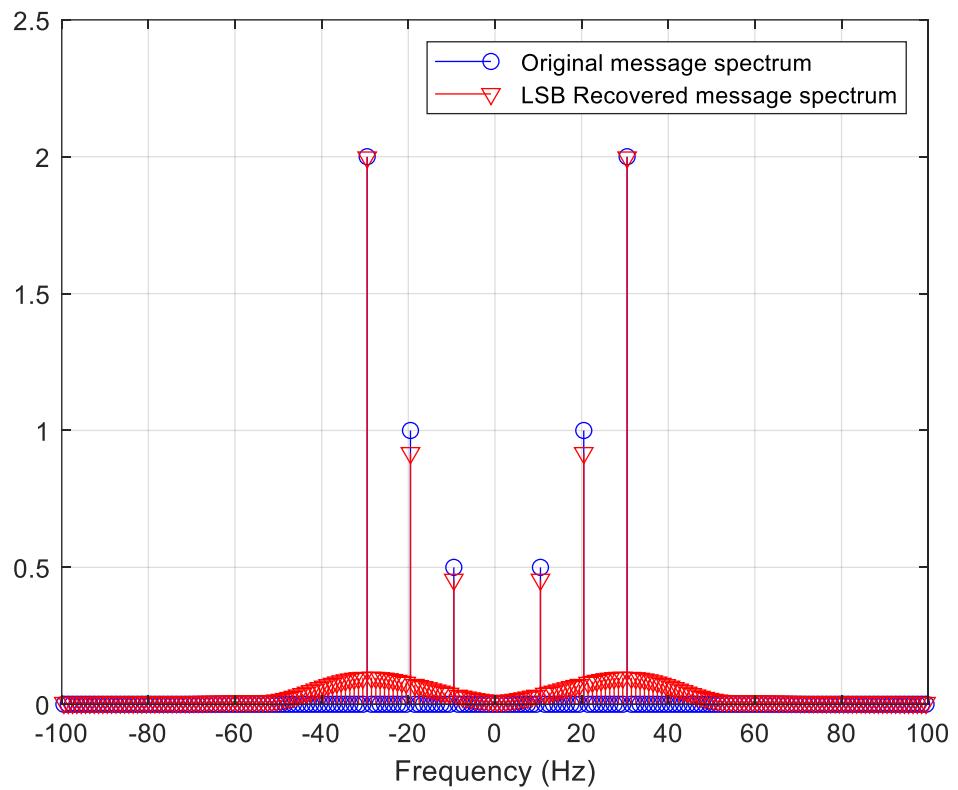


Figure 9 - LSB Recovered Message Signal after Low Pass Filter

After passing through the low pass filter (with a cutoff of 35 and a stop at 65), our signal ultimately returns to the frequency values of our original signal. Thus, we can state that our signal has been preserved during the transfer.

Q2

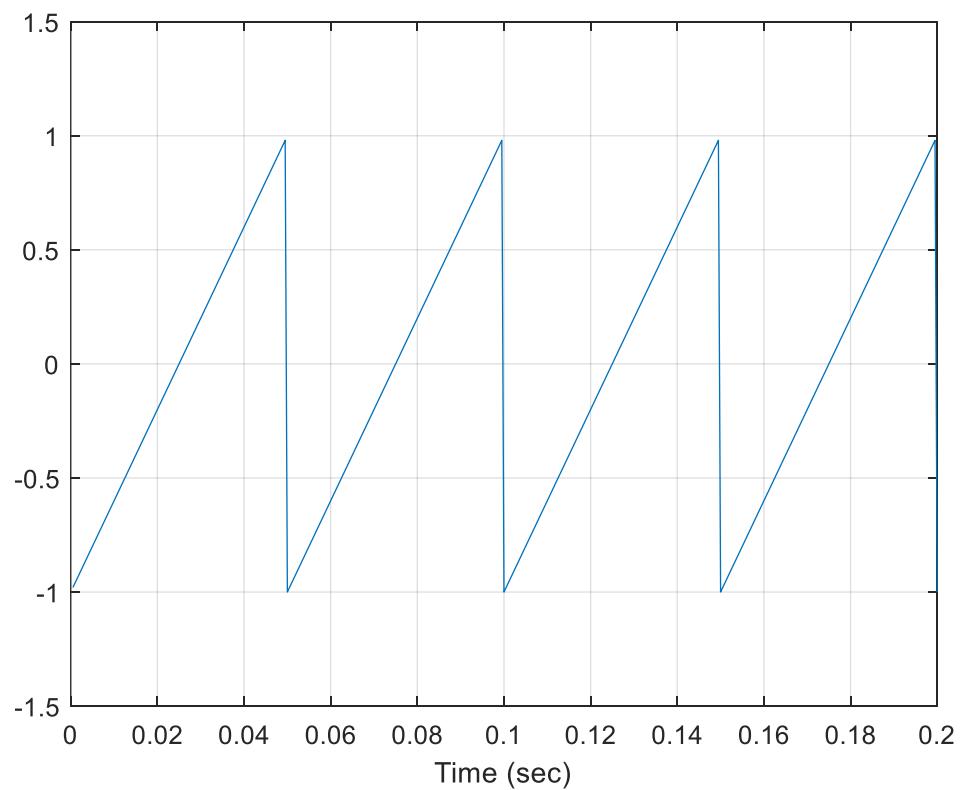
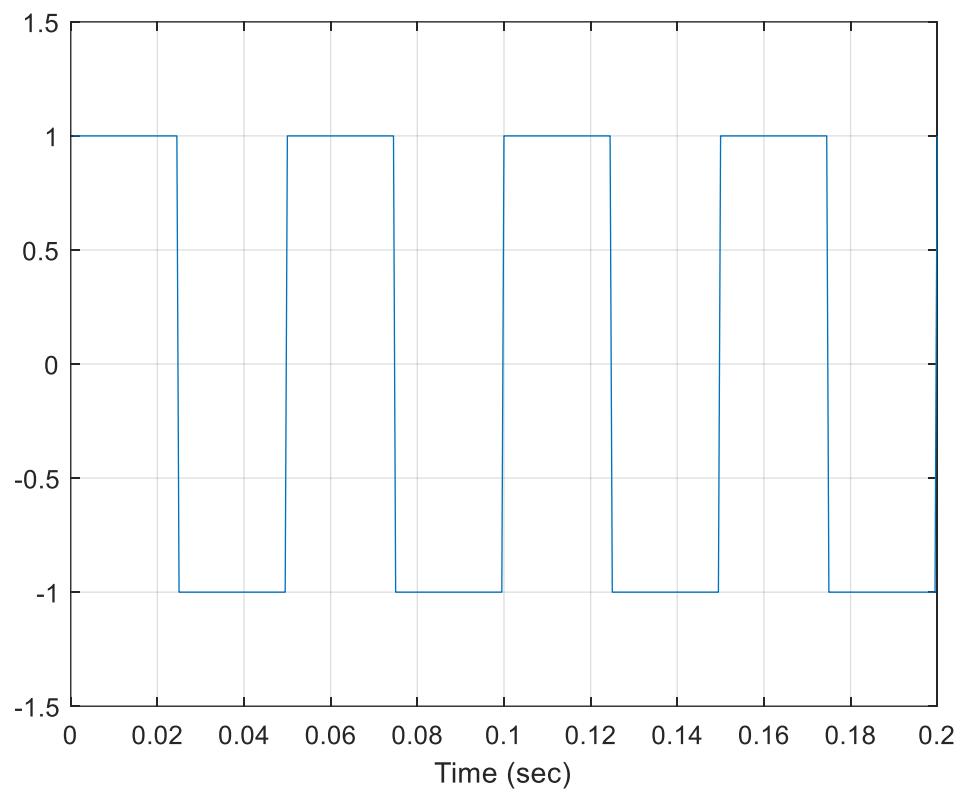


Figure 10 - Sawtooth Message Signal (20 Hz)



*Figure 11 - Square Message Signal (20 Hz)*

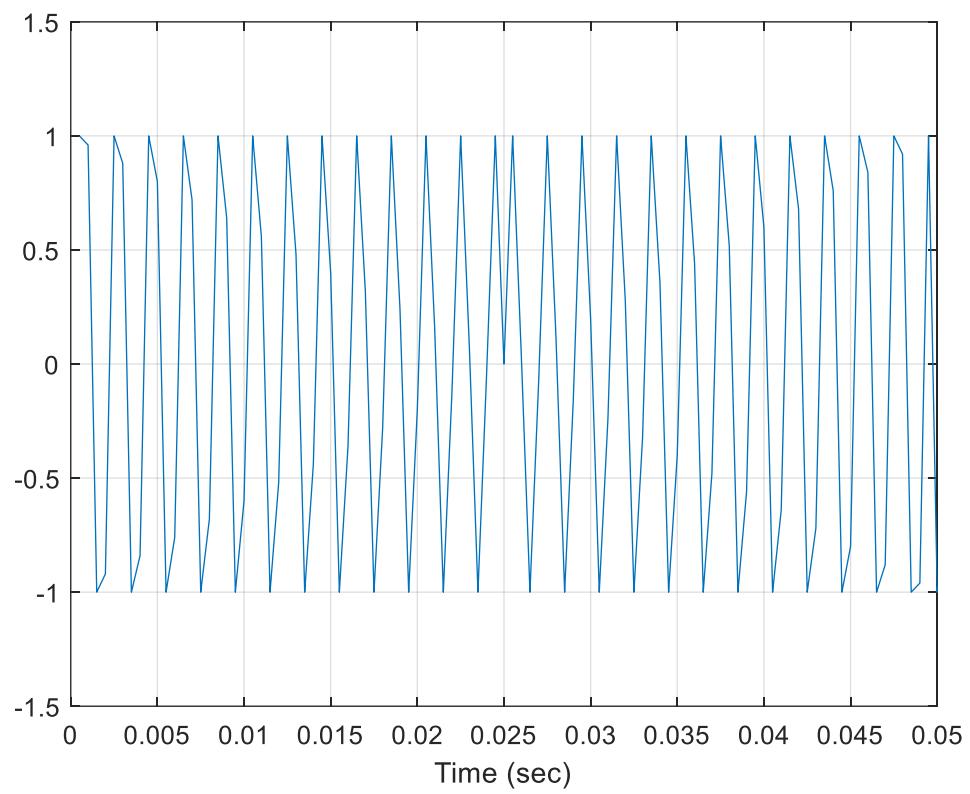
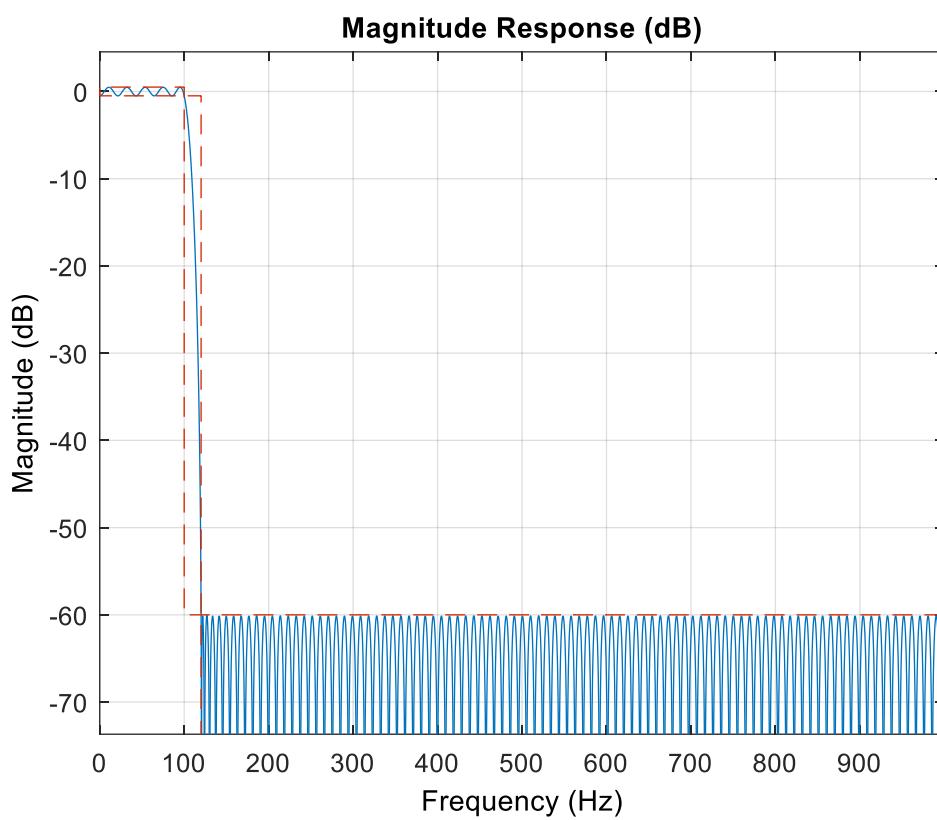
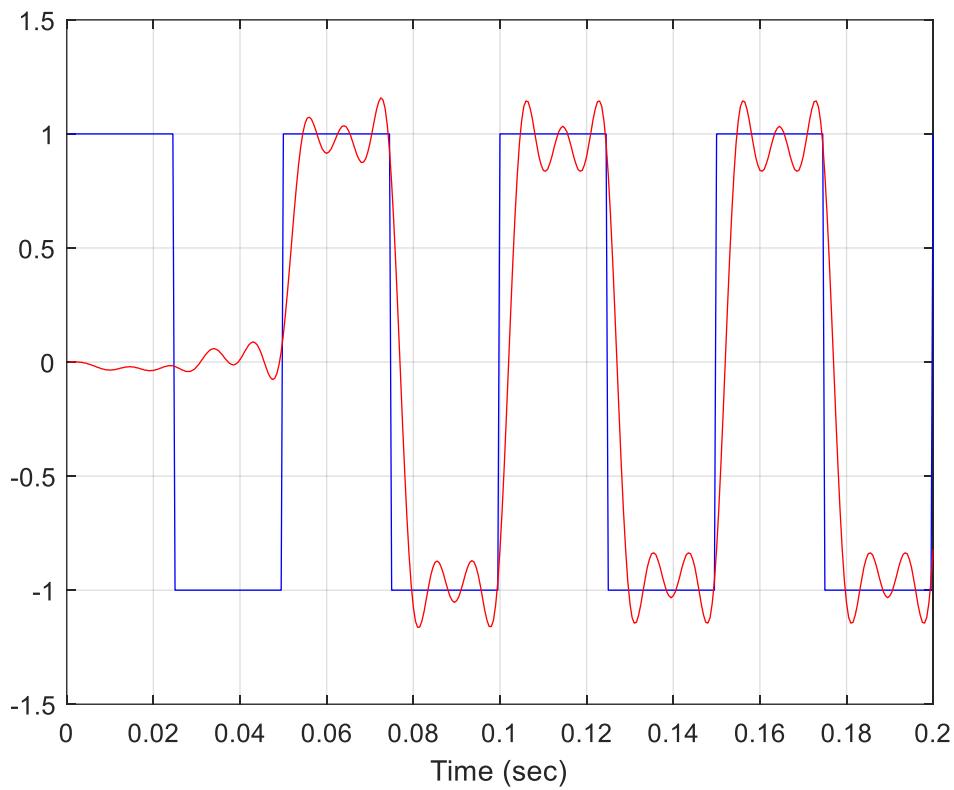


Figure 12 – QAM Modulation of Sawtooth and Square Message Signals (500 Hz)

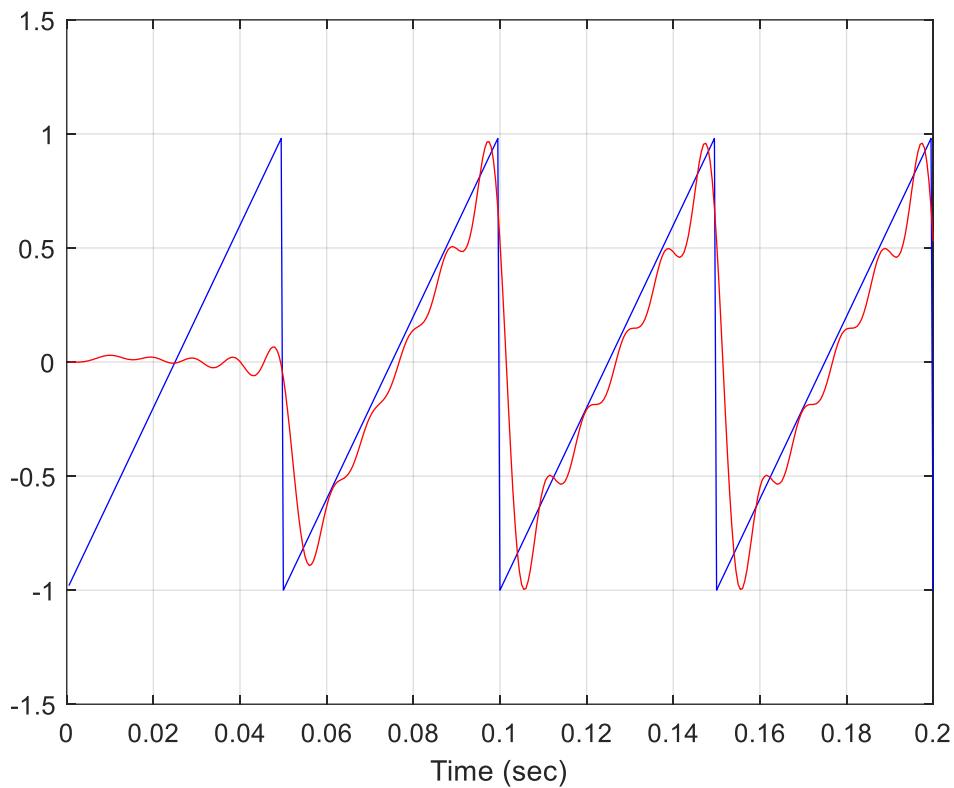


*Figure 13 - Low Pass Filter*



*Figure 14 - QAM Recovered Message Signal after Low Pass Filter for Square Message Signal*

During the suppression of the QAM signal over time, the initial moments involve the process of the filter's transition, during which high-frequency components are detected and eliminated. As a result, the original signal cannot be fully recovered at the beginning.



*Figure 15 - QAM Recovered Message Signal after Low Pass Filter for Sawtooth Message Signal*

During the suppression of the QAM signal over time, the initial moments involve the process of the filter's transition, during which high-frequency components are detected and eliminated. As a result, the original signal cannot be fully recovered at the beginning.