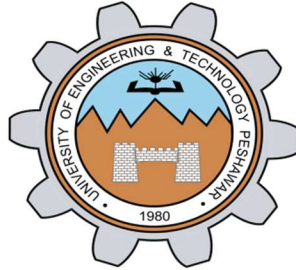


Lab Report No 8



Digital Signal Processing

Submitted By:

Registration No:

Section:

“On my honor , as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work”

Student Signature:

Department of Computer Systems Engineering

University of Engineering and Technology Peshawar

Demonstration of Concepts	Poor (Does not meet expectation (1))	Fair (Meet Expectation (2-3))	Good (Exceeds Expectation (4-5))	Score
	The student failed to demonstrate a clear understanding of the assignment concepts	The student demonstrated a clear understanding of some of the assignment concepts	The student demonstrated a clear understanding of the assignment concepts	30%
Accuracy	The student completed (<50%) tasks and provided MATLAB code and/or Simulink models with errors. Outputs shown are not correct in form of graphs (no labels) and/or tables along with incorrect analysis or remarks.	The student completed partial tasks (50% - <90%) with accurate MATLAB code and/or Simulink models. Correct outputs are shown in form of graphs (without labels) and/or tables along with correct analysis or remarks.	The student completed all required tasks (90%-100%) with accurate MATLAB code and/or Simulink models. Correct outputs are shown in form of labeled graphs and/or tables along with correct analysis or remarks.	30%
Following Directions	The student clearly failed to follow the verbal and written instructions to successfully complete the lab	The student failed to follow the some of the verbal and written instructions to successfully complete all requirements of the lab	The student followed the verbal and written instructions to successfully complete requirements of the lab	20%
Time Utilization	The student failed to complete even part of the lab in the allotted amount of time	The student failed to complete the entire lab in the allotted amount of time	The student completed the lab in its entirety in the allotted amount of time	20%

Lab No: 8.

Title: Analysis of Amplitude Modulated and Demodulated Signal using Matlab

Provide .m file with detailed comments

Tasks:

- 1. Define Amplitude Modulation:**

- 2. Define Amplitude Demodulation:**

- 3. List three reasons, why we implement Amplitude Modulation in Communication Systems**

- 4. Define Modulation Index**

- 5. Input Modulation Index from 0 to 1.4, the increment step should be 0.2. Observe/analyze and comment about the output observed.**

Procedure:

1. Create and plot (both time and frequency domain) a two-tone message signal with amplitude 10v and frequency 300 and 600 Hz

```
s = 10*sin(2*pi*300*t)+10*sin(2*pi*600*t);
```

2. Create and plot (both time and frequency domain) the carrier signal with amplitude 10/Modulation Index with frequency of 10 kHz and sampling frequency to 80 kHz. Generate a time vector having a duration of 0.01 s.

```
m = 0.5
```

```
fc = 10e3;
```

```
fs = 80e3;
```

```
t = (0:1/fs:0.01)';
```

```
c = 10/m*sin(2*pi*fc*t)
```

(Modulation index is a measure of extent of modulation done on a carrier signal. In Amplitude modulation, it is defined as the ratio of the amplitude of modulating signal to that of the carrier signal.)

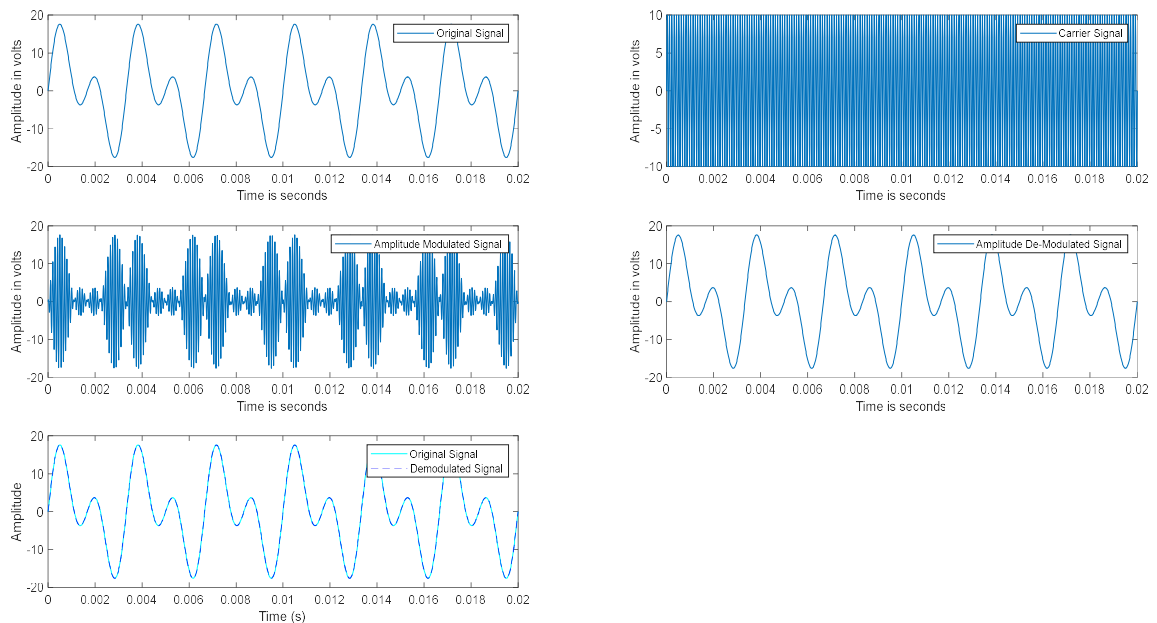


Figure 1: Time Domain Signals

3. Modulate the message signal with the carrier using the desired Modulation Index. Plot modulated signal in both time and frequency domain. Observe/Analyze the output.

Hint: $y = \text{ammod}(s, f_c, f_s, 0, A_c);$

4. Demodulate the Modulated signal . Observe/Analyze the output.

Hint: $z = \text{amdemod}(y, f_c, 100000, 0, A_c);$

5. Following are the plots of the desired outputs in frequency domain.

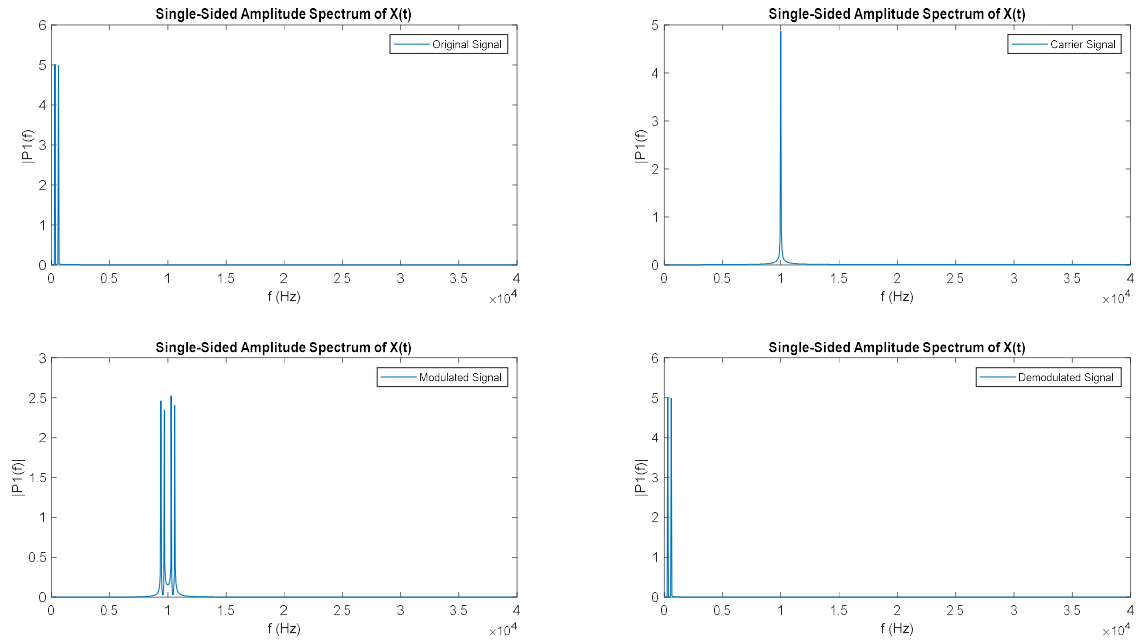


Figure 2: Frequency Domain Signal