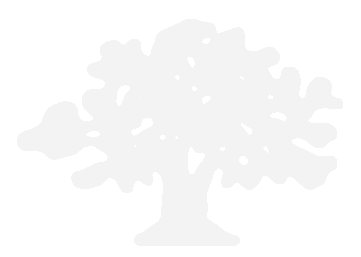
**Electrical and Computer Systems Engineering Department**

**Simulation Lab   
  
(ENEE4104)***Assignment 1  
 DSB-Standard AM Modulation & Demodulation*

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Section: 2

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Part One: **AM Modulation**

For m(t) = 10 cos () and c(t) = 20 cos ()

Modulation Index = 0.5

MatLab Code:

Fm = 200;

Fc = 35000;

M = 0.5; %modulation index

fs=70000;%sampling frequency

n=0:7:7000;

m=10\*cos(2\*pi\*Fm\*n/fs); %Modulating Signal

c=20\*cos(2\*pi\*Fc\*n/fs);%Carrier Sinal

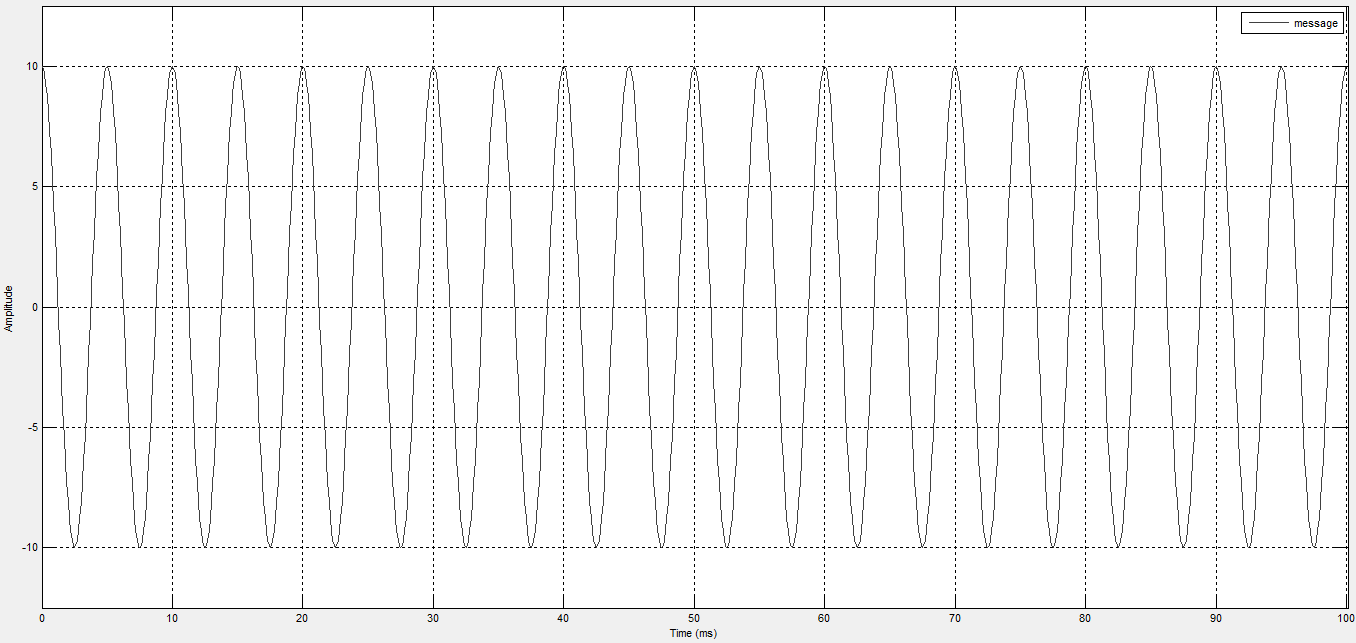
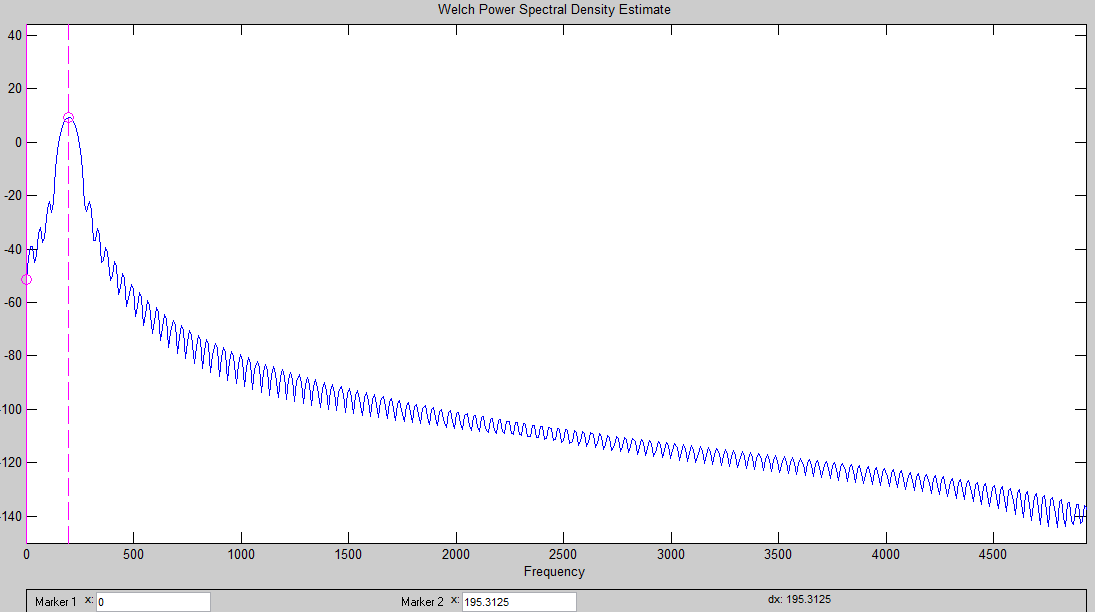
s =(1+M\*cos(2\*pi\*200\*n/fs)).\*c ;%Am Signal

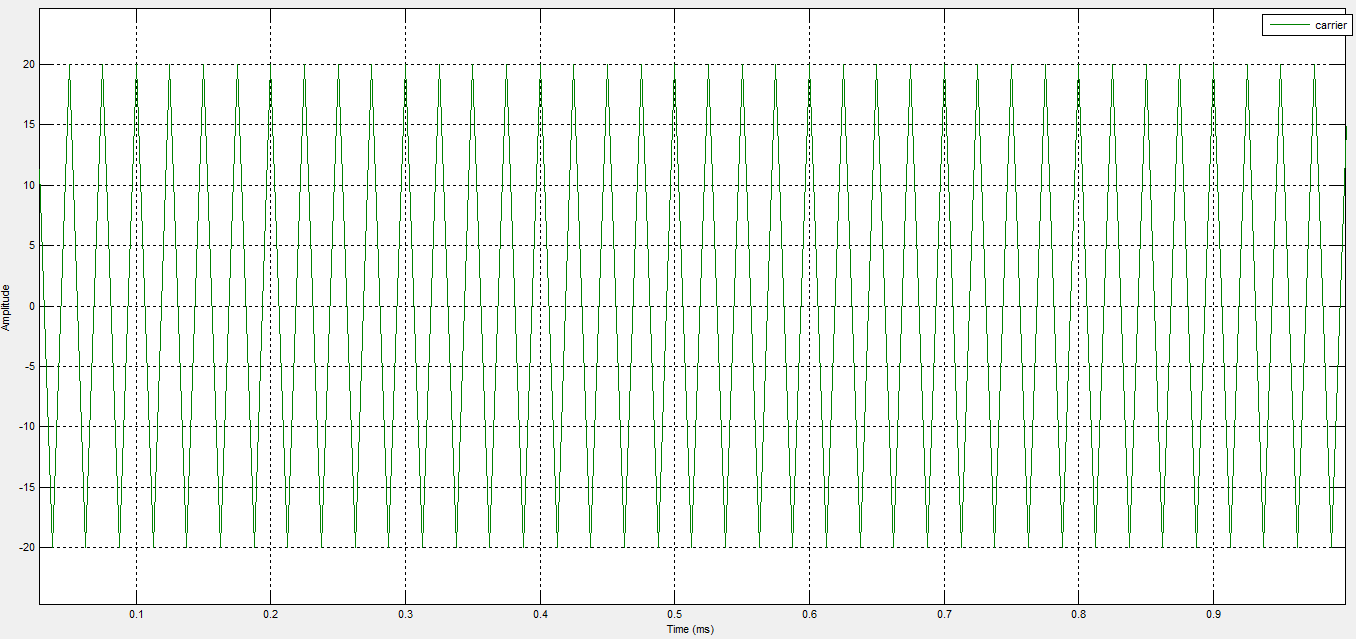
stem(s);grid;

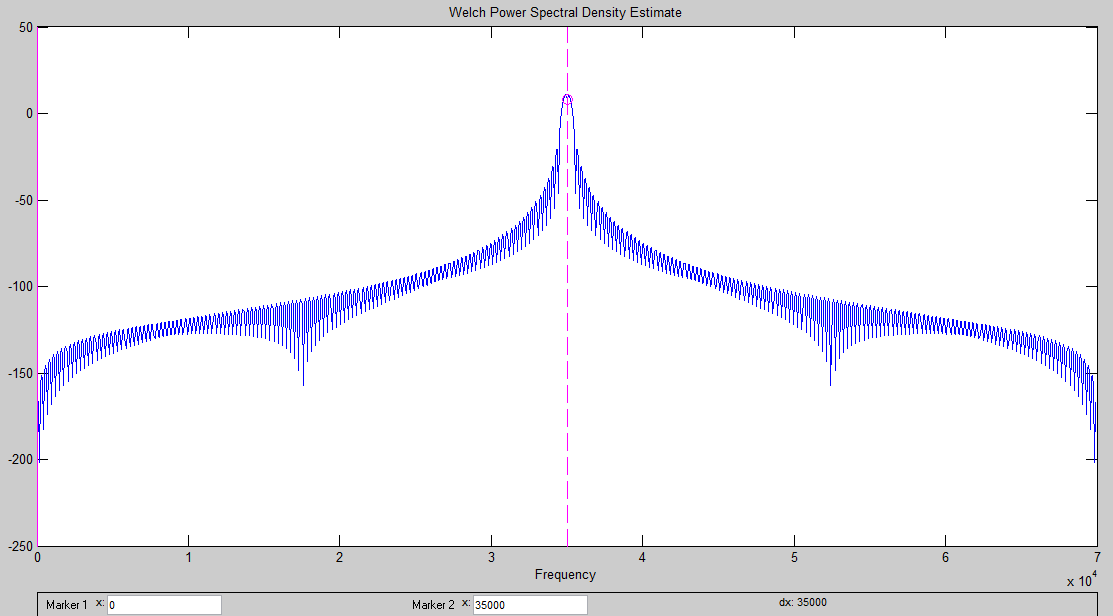
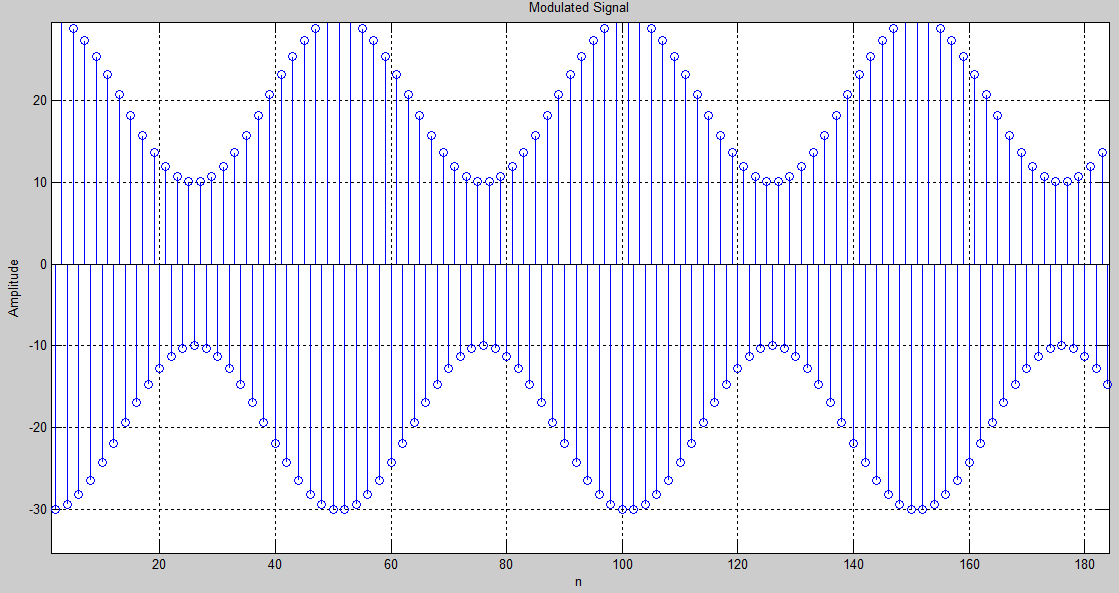
title('Modulated Signal');

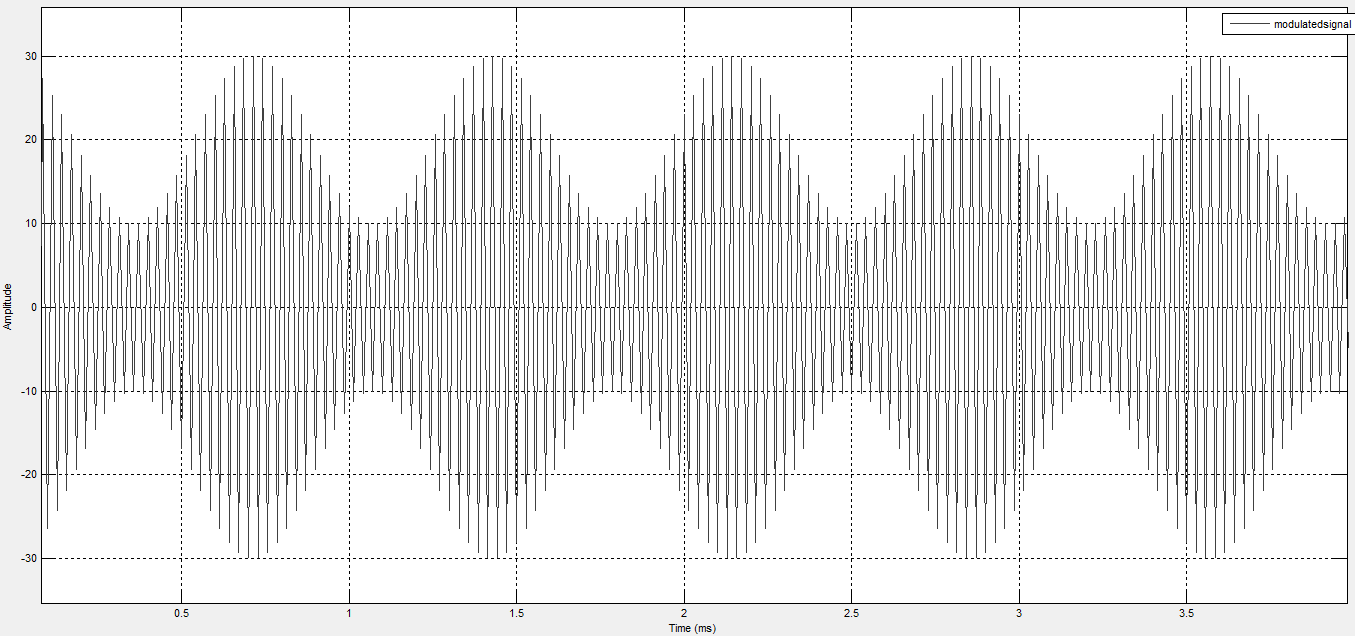
ylabel('Amplitude');

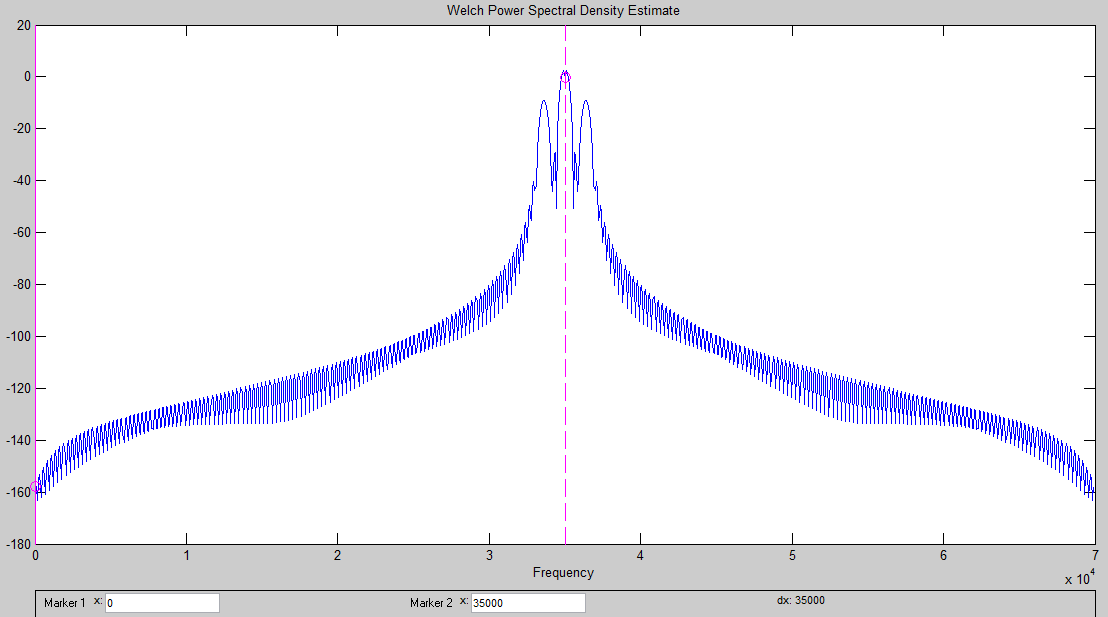
xlabel('n')

  
*Figure -1-: Message Signal.* *Figure -2-: Message Signal Spectrum.*

  
*Figure -3-: Carrier Signal.*

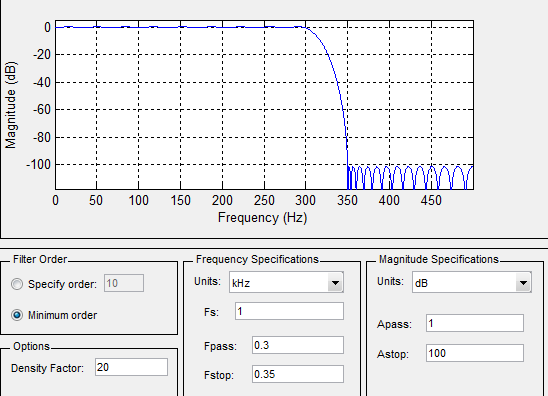
 *Figure -4-: Carrier Signal Spectrum.* *Figure -5-: Sampled Modulated Signal.*

 *Figure -6-: Modulated Signal in Time Domain.*

  
*Figure -7-: Modulated Signal in Frequency Domain.*

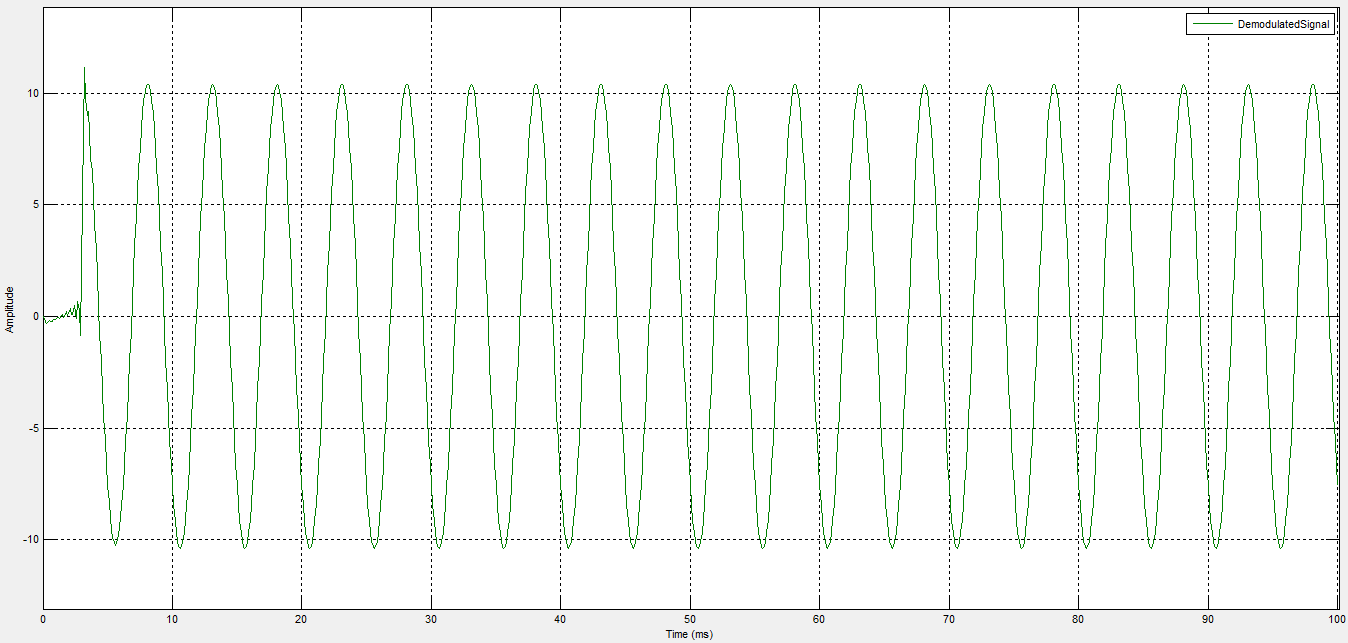
Part Two: **AM Demodulation (Receiver)   
Using Envelop Detector Method**

env =abs(s) - 20; %to obtain the envelop of the modulated signal, -20 is to remove the DC component of the signal.  
  
**Using SPTool to Design a Low Pass Filter**



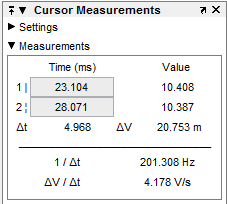
*Figure -8-: Magnitude Response and Filter Parameters.*

**After Filtration**



*Figure -9-: Demodulated Signal.*

**The Amplitude of Demodulated Signal =10.4 volt.  
The Frequency of Demodulated Signal =200 Hz.**



*Figure -10-: Curser Measurement.*