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DT 008/2

DIGITAL COMMUNICATIONS ENGINEERING 1

Laboratory 2 - Results Sheet

Exercise 1:

Code

```
% Lab 2 - Talha Tallat

Fs = 100;

t = [0:1/Fs : 1];

A = 1; f = 10;

x = A*sin(2*pi*f*t);


figure, plot(t, x), xlabel ( 'Time' ), ylabel ('Amplitude')

title('Time domain')

x = fftshift (abs(fft(x)))

Fr = [-Fs/2:Fs/2]

figure, plot(Fr, x)

xlabel('Frequency'), ylabel('Magnitutde')


figure, plot (Fr, 20*log10(x))

ylim([-40, 10])

xlabel('Frequency'), ylabel('Magnitude')
```

Plot

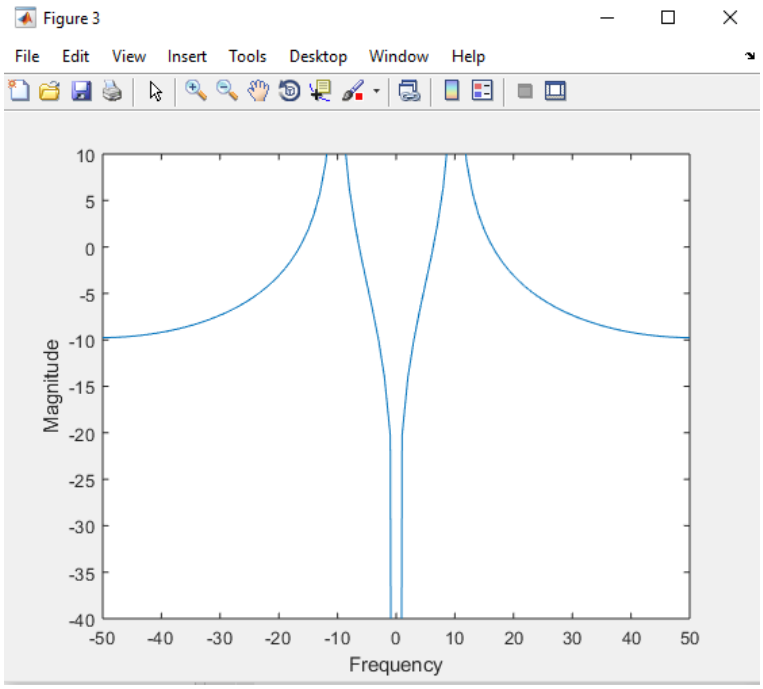


Figure 3
File Edit View Insert Tools Desktop Window Help
Magnitude
Frequency
10 5 0 -5 -10 -15 -20 -25 -30 -35 -40
-50 -40 -30 -20 -10 0 10 20 30 40 50

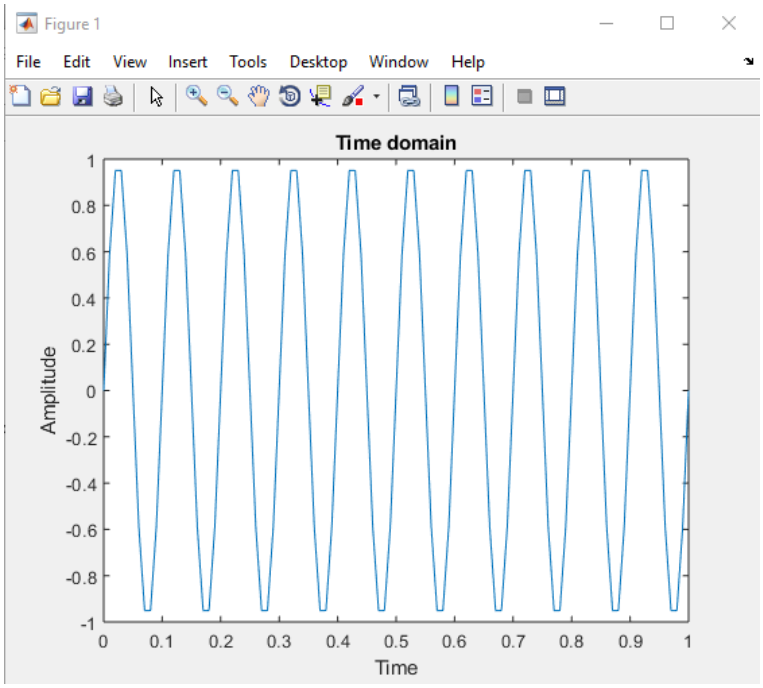
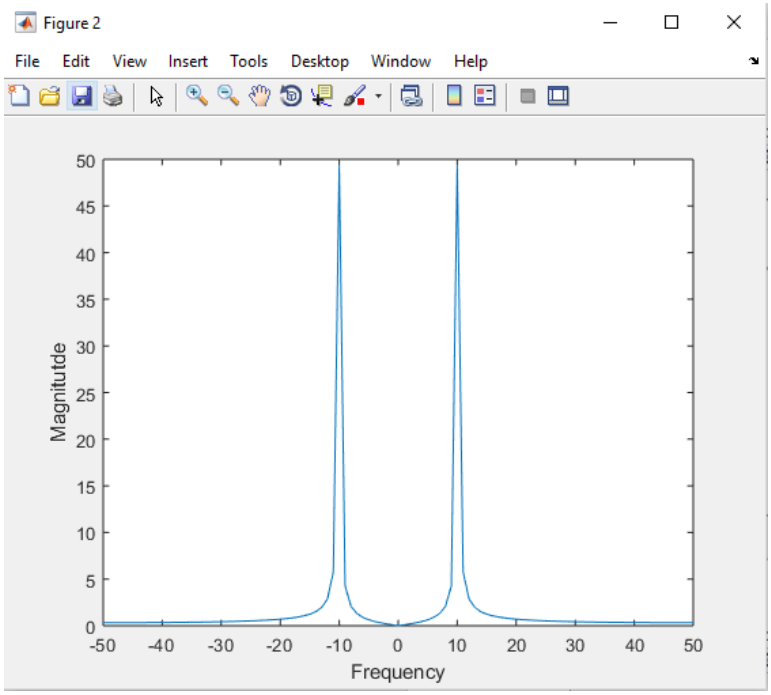


Figure 1
File Edit View Insert Tools Desktop Window Help
Time domain
Amplitude
Time
1 0.8 0.6 0.4 0.2 0 -0.2 -0.4 -0.6 -0.8 -1
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1

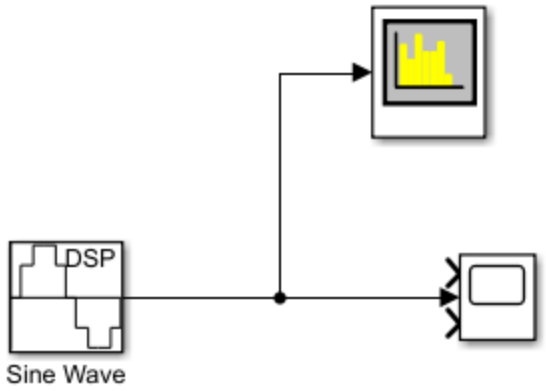


Question

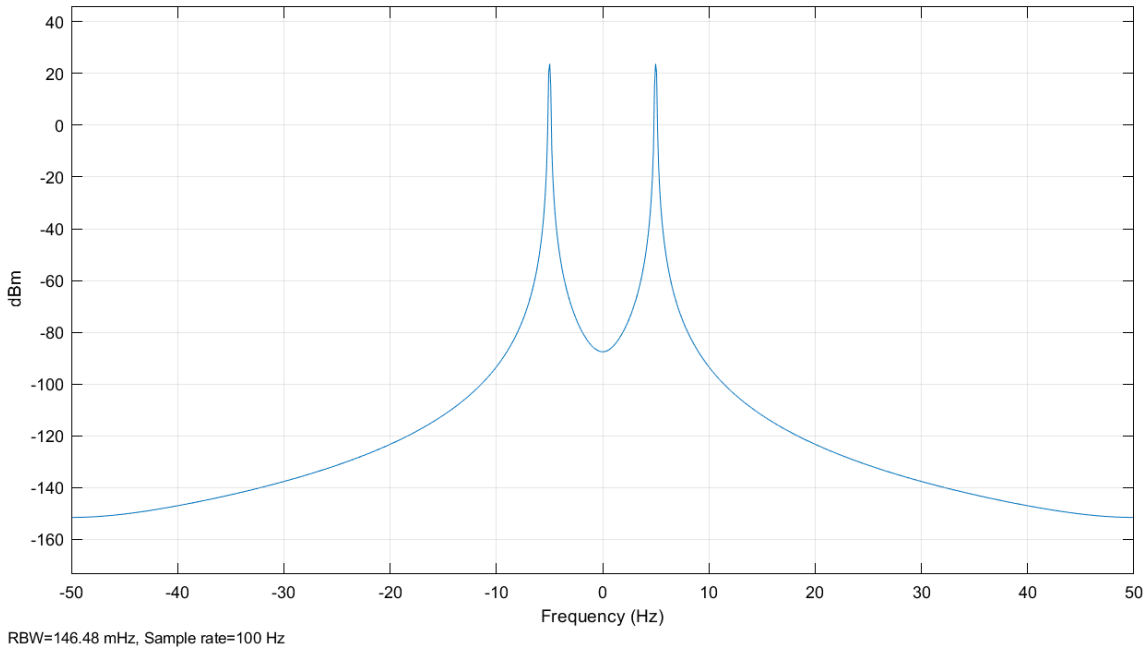
Frequency exhibits at 10 and -10.

Exercise 2:

Model

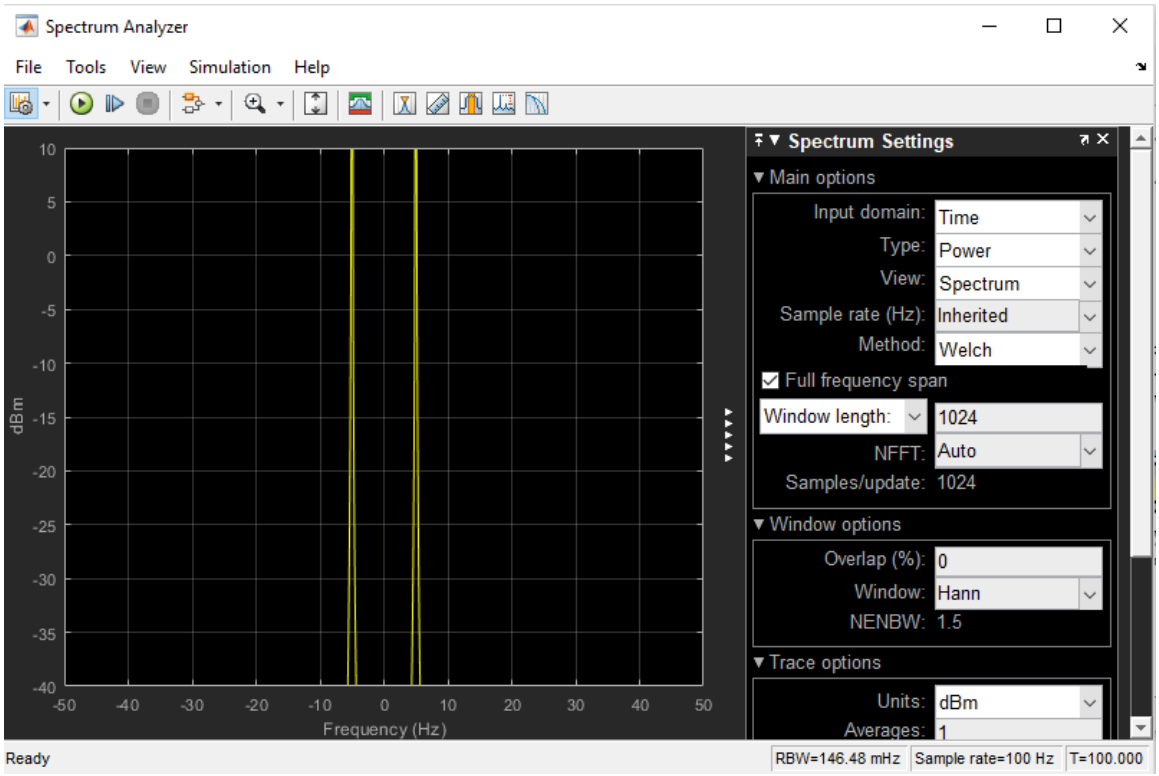


Spectrum Scope view



The frequency range that is displayed by the spectrum scope is -50 to 50 (-10, 10)

The sample rate is = 100Hz



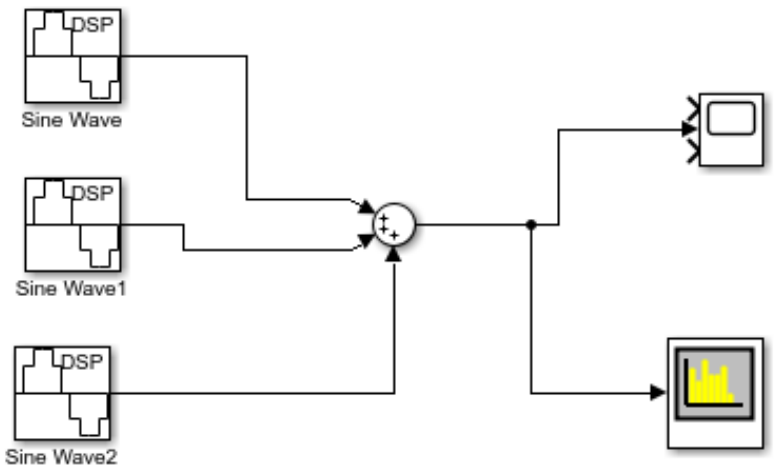
Question

The frequency range that is displayed by the spectrum scope is -50 to 50 (-5, 5)

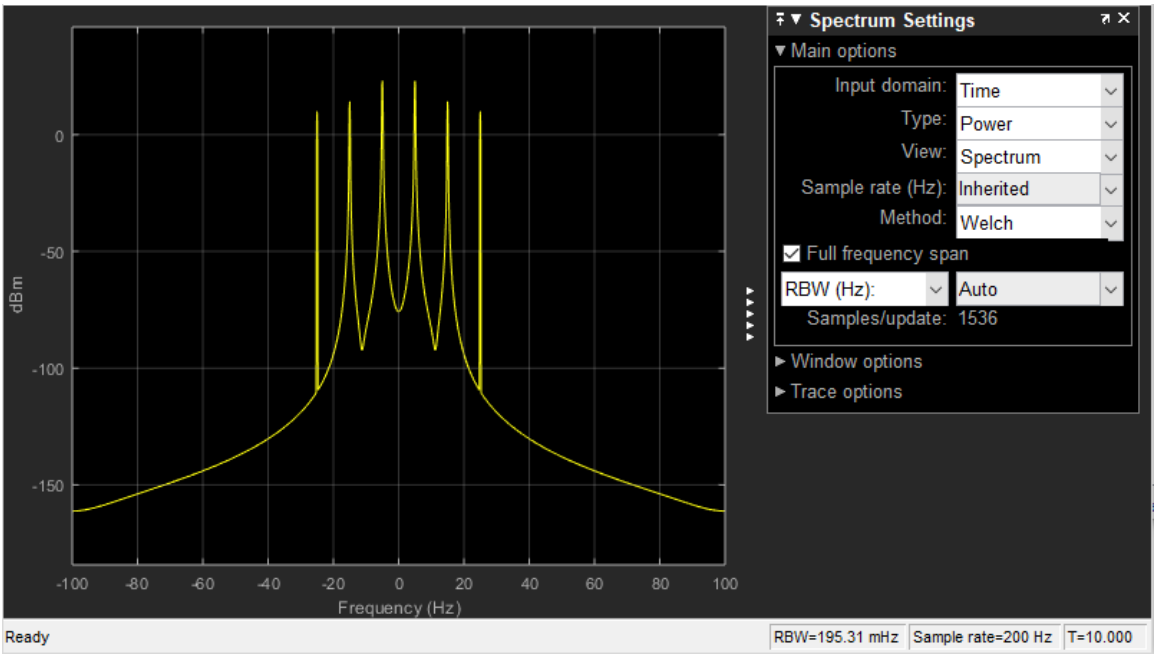
The sample rate is = 100Hz

Exercise 3:

Model



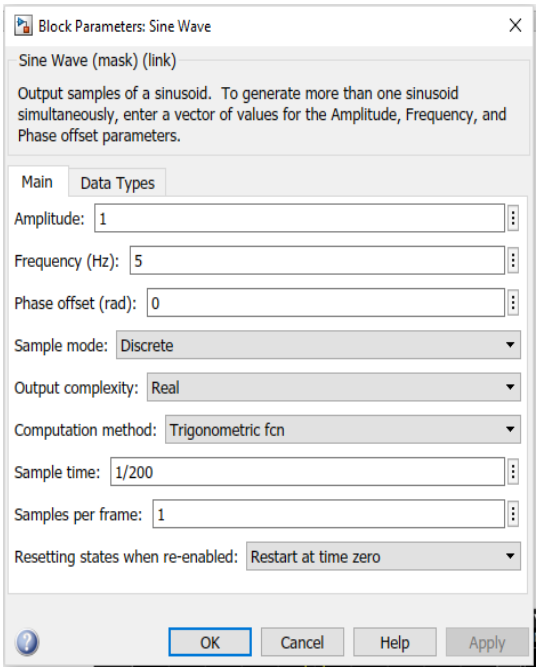
Spectrum Scope view

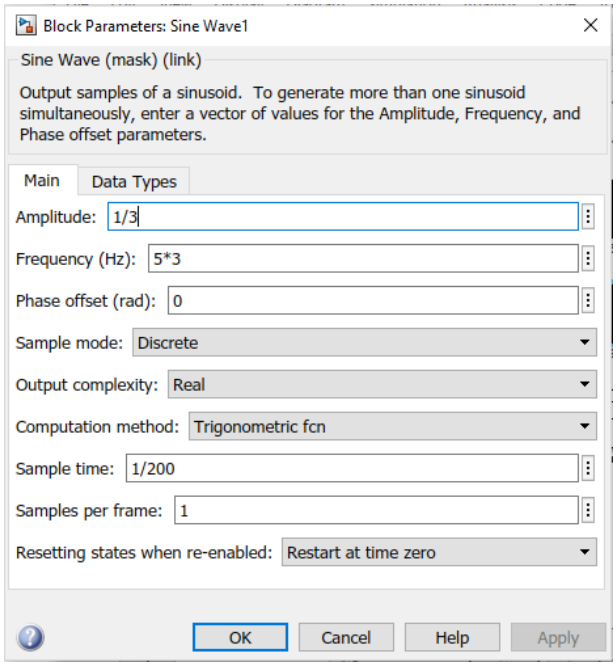


T=10s

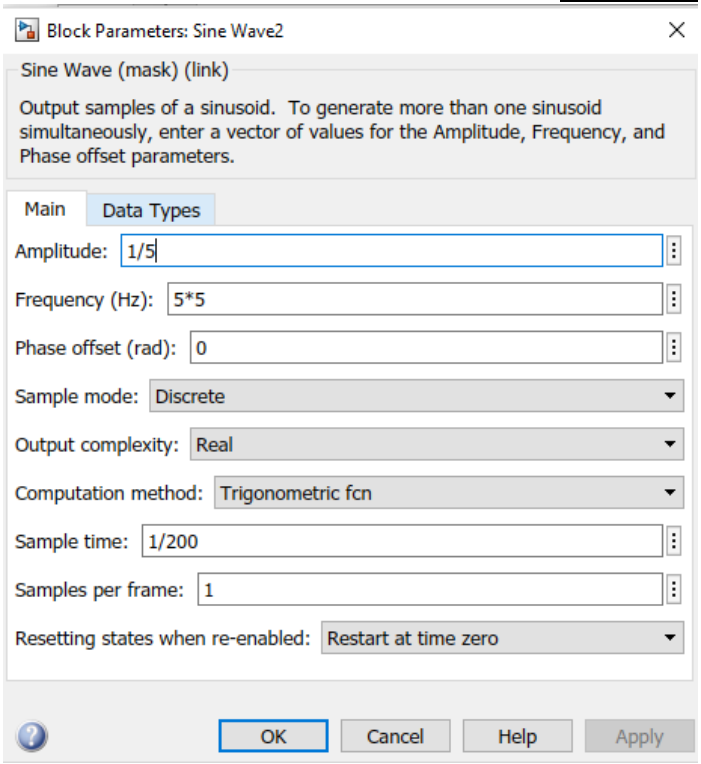
Frequence: 200Hz

RBW: 195.3mHz


Block Parameters: Sine Wave
Sine Wave (mask) (link)
Output samples of a sinusoid. To generate more than one sinusoid simultaneously, enter a vector of values for the Amplitude, Frequency, and Phase offset parameters.
Main
Data Types
Amplitude: 1
Frequency (Hz): 5
Phase offset (rad): 0
Sample mode: Discrete
Output complexity: Real
Computation method: Trigonometric fcn
Sample time: 1/200
Samples per frame: 1
Resetting states when re-enabled: Restart at time zero
OK
Cancel
Help
Apply


Block Parameters: Sine Wave1
Sine Wave (mask) (link)
Output samples of a sinusoid. To generate more than one sinusoid simultaneously, enter a vector of values for the Amplitude, Frequency, and Phase offset parameters.
Main
Data Types
Amplitude: 1/3
Frequency (Hz): 5*3
Phase offset (rad): 0
Sample mode: Discrete
Output complexity: Real
Computation method: Trigonometric fcn
Sample time: 1/200
Samples per frame: 1
Resetting states when re-enabled: Restart at time zero
OK
Cancel
Help
Apply

Parameters


Block Parameters: Sine Wave2
Sine Wave (mask) (link)
Output samples of a sinusoid. To generate more than one sinusoid simultaneously, enter a vector of values for the Amplitude, Frequency, and Phase offset parameters.
Main
Data Types
Amplitude: 1/5
Frequency (Hz): 5*5
Phase offset (rad): 0
Sample mode: Discrete
Output complexity: Real
Computation method: Trigonometric fcn
Sample time: 1/200
Samples per frame: 1
Resetting states when re-enabled: Restart at time zero
OK
Cancel
Help
Apply

Question

The Frequency range displayed by the Spectrum scope is -100 to +100

The Sampling rate Frequency is = 200Hz