Signal processing

Homework 1

1.

Since is the Fourier transform of , impulse response function can be evaluated by taking inverse Fourier transform to .

By the definition of the frequency response function, the first term and the third term become zero. The impulse response function can be expressed as

The subtraction of the exponential terms can be written in sine function by using Euler’s formula given as .

The expression is simplified by using function given as

2.

2.1. To observe the bandwidth of the signal, we take Fourier transform into the .