ECE-205 : Circuits and Systems

Homework #6

Due : Tuesday January 26 at 5 PM

1) Chapter 5, problem 5.7

2) Chapter 5, Problem 5.18

3) Chapter 5, Problem 5.20

4) *Convolution Application*

Download and unzip the file *HW.rar* from the course webpage. It should contain the following three files:

Conv_App.m (MATLAB driver file)

SamMagee.wav (Recording of a speech)

concert_hall.wav (Recording of an impulse response of the Promenadikeskus concert hall in Pori, Finland[1])

SamMagee.wav is a recording of a speech taken in an anechoic chamber, whereas *concert_hall.wav* is a measured (or recorded) impulse response of a concert hall. Your goal is to find out how *SamMagee.wav* would sound like if it had been played in the concert_hall. That is, you will take *SamMagee.wav* as an input $x(t)$ and feed it to a system with an impulse response $h(t)$ given by *concert_hall.wav*.

Start by opening the MATLAB driver file (*Conv_App.m*) and filling in the missing lines. You will need to use the MATLAB built-in functions ***conv*** to convolve $x(t)$ and $h(t)$ and ***sound*** to play your convolved output $y(t)$, respectively. (type ***help*** *function_name* in MATLAB command-line to find out how these functions work). Describe how the system output $y(t)$ sound like, when compared to the input *SamMagee.wav*. Plot the input $x(t)$, the impulse response $h(t)$, and the system output $y(t)$. Print and submit your updated MATLAB driver file, along with your three plots and short description of how the output $y(t)$ sounds like.