March 2, 2014

BLG 354E SIGNALS AND SYSTEMS

Homework 1

Question 1: Compute the output(y[n]) of the system(h[n]) to the given input(x[n]) using discrete-time convolution. Provide details of each step.

$x[n] = 10\delta[n+1] + 5\delta[n] - 5\delta[n-2] - 10\delta[n-3]$

$h[n] = -\delta[n-5] + \delta[n-7]$

Question 2: Compute the output(y[n]) of the system(h[n]) using discrete-time convolution. Provide details of each step.

$x[n] = 5\delta[n] + 10\delta[n-1] + 15\delta[n-]2 + 20\delta[n-3]$

$h[n] = \delta[n] + 2\,\delta[n-1] + 3\delta\,[n-2] + 4\delta[n-3]$

Question 3: Find and plot the convolution of the following signals. Provide details of each step. Perform these convolutions numerically using MATLAB.

a- $h(t) = 10\exp(-10t)u(t)$ $x(t) = u(t)$

b- $h(t) = 10\exp(-10t)u(t)$ $x(t) = u(t) - u(t-2)$

ATTENTION: You should submit your homework due to **14 March 2014 Friday 17:00**. Solutions of the questions should be submitted to the Signals&Systems box in the Department Secretarial Office and MATLAB codes should be submitted to Ninova system.