	Independent University Bangladesh (IUB) School of Engineering, Technology and Sciences (SETS) Department of Electrical and Electronic Engineering Autumn 2020 EEE 321LAB

Lab 4: Study on signal decomposition, downsampling, folding and shifting

Objectives:

1. To make a MATLAB function so that signal decomposition into even and odd symmetry can be done.
2. To make a MATLAB function so that downsampling / decimation of a signal can be done.

Labwork:

1. Develop a **MATLAB** function named **"evenodd"** that has a form;

   function [xe,xo,m] = evenodd(x,n)

2. (i) Generate **x[n] = u(n) – u(n-10)** where **$-10 \leq n \leq 10$**

   (ii) Decompose **x[n]** to generate **$x_e[n]$ and $x_o[n]$.**

   (iii) Plot both **x[n]**, **xe[n]** and **xo[n]** and **comment** on the result.

3. Develop a **MATLAB** function named **"dnsample"** that has a form;

   "function = dnsample(n, M)"

4. (i) Generate **x[n] = sin(0.125πn)** where **$-50 \leq n \leq 50$**

   (ii) **Decimate/downsample x[n]** by a **factor of 4** to generate **y[n].**

   (iii) Plot both **x[n]** and **y[n]** and **comment** on the result.

5. Use *fliplr* function to generate the signal **x[-n]** given that **x[n] = u(n-2)**.

Lab Assignment-4:

Develop a MATLAB function that will generate $x[n^2]$ of a signal.