ECN-203: Signals & Systems (CSE)
Assignment 1
Due date: Sunday 6 September 2020

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1. Determine the values of P_∞ and E_∞ for each of the following signals (Marks: 5+5)

   (a) $x_1(t) = \begin{cases} e^{-2t}, & t \geq 0 \\ 0, & Otherwise \end{cases}$

   (b) $x_2[n] = cos(\frac{\pi}{4}n)$, $-\infty < n < \infty$, $n \in \mathbb{I}$

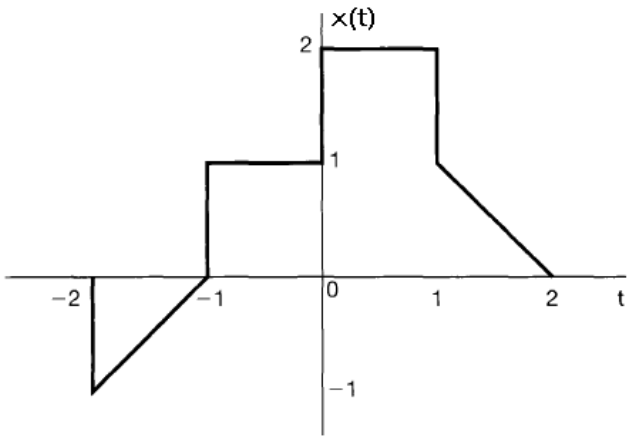
2. Find even and odd decomposition of following signals (Marks: 5+5+5)

   (a) $x_1(n) = \begin{cases} 2, & 0 \leq n \leq 6 \\ 0, & Otherwise, \end{cases}$ $n \in \mathbb{I}$

   (b) $x_2(t) = sin(\frac{t}{2})$, $-\infty < t < \infty$, $t \in \mathbb{R}$

   (c) $x_3(n) = \begin{cases} (\frac{1}{2})^n, & n \geq 3 \\ 0, & Otherwise, \end{cases}$ $n \in \mathbb{I}$

3. Consider the signal $x(t)$ shown below:



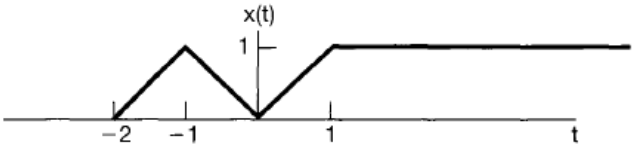
   Plot the following signals: (Marks: 5+5+5)

   (a) $x(3-t)$

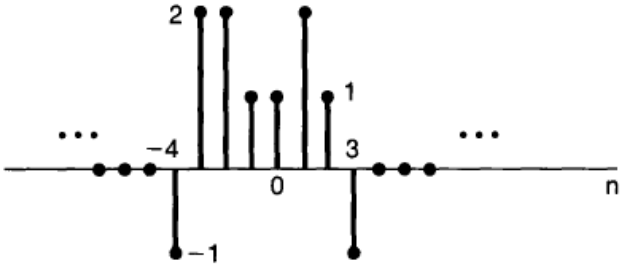
   (b) $x(3t+2)$

(c) $x(5 - \frac{t}{2})$

4. Determine and sketch the even and odd parts of the following signals (Marks: 10+10)



(a)



(b)

5. Let $x_1[n]$ is an odd signal and $x_2[n]$ is an even signal (Marks: 5+5)

   (a) Find $\sum_{-\infty}^{\infty} x_1[n]$

   (b) Is $x_1[n] \times x_2[n]$ an odd signal, even signal, or none?