Assignment 2

1 Question 1

evaluate P_∞ and E_∞ for each of the following continuous time signals

1. $x(t) = e^{-2t}u(t)$
2. $x(t) = sin(t)$

2 Question 2

evaluate P_∞ and E_∞ for each of the following discrete time signals

1. $x[n] = (\frac{1}{2})^n u[n]$
2. $x[n] = cos(\frac{\pi}{4}n)$

3 Question 3

For each of the following systems, determine whether it has Memory, is Time invariant, Linear, causal and/or stable. Justify your answer :

1. $y(t) = x(t-2) + x(2-t)$
2. $y(t) = x(t/3)$
3. $y(t) = \frac{d}{dt}x(t)$

4 Question 4

For each of the following systems, determine whether it has Memory, is Time invariant, Linear, causal and/or stable. Justify your answer :

1. $y[n] = x[n-2] - 2x[n-8]$
2. $y[n] = n^2 x[n]$
3. $y[n] = x[4n+3]$

5 Question 5

Consider an LTI system whose response to the signal $x_1(t)$ in Figure 1 is $y_1(t)$ shown in Figure 2. What is the response to the signal in Figure 3?

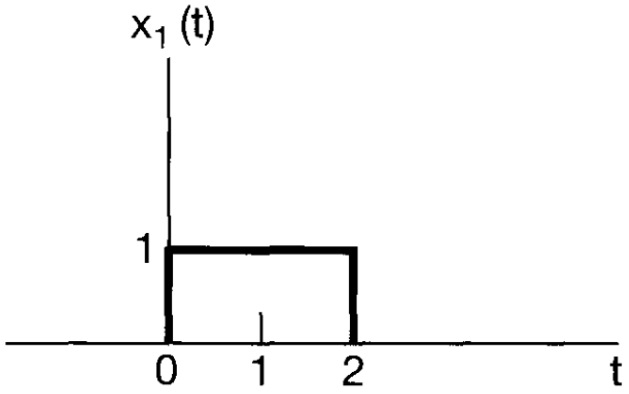

Figure 1: $x_1(t)$

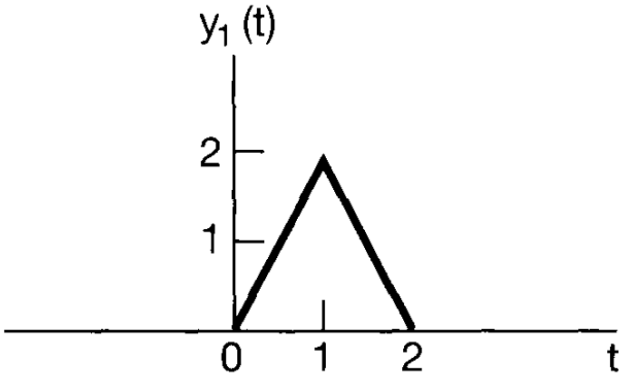

Figure 2: $y_1(t)$

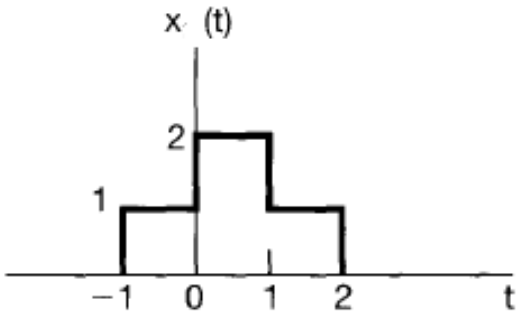

Figure 3: $x(t)$