EC 8352 Signals and Systems

Important 13mark questions

Unit I

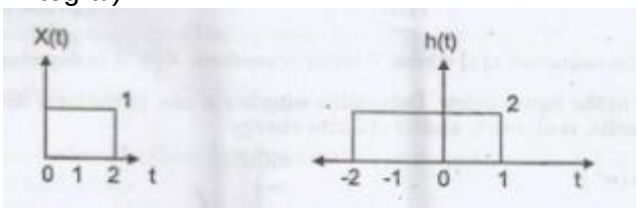
1. A continuous time system has the input relation given by $y(t) = tx(t-1)$ Determine whether the system is
   (i) Linear
   (ii) Time-invariant
   (iii) Stable
   (iv) Memoryless
   (v) Casual
2. Find out whether the following signals are periodic or not. If periodic find the period $x(t) = 2cos(10t + 1) - sin(4t - 1)\, x(n) = cos(0,1,\pi n)$.

Unit II

1. Find the Fourier transform of $x(t) = e^{-a|t|}, a > 0$ and sketch its corresponding magnitude spectrum.
2. Find the Fourier transform of a rectangular pulse with width T and amplitude A.

Unit III

1. Find the condition for which Fourier transform exists for x(t). Find the Laplace transform of x(t) and its ROC, $x(t) = e^{-at}u(-t)$
2. Find the response y(t) of an LTI system whose x(t) and h(t) are shown in fig. (Using convolution integral)



Unit IV

1. Find the Z transform and sketch the ROC of the following sequence $x[n] = 2^n u[n] + 2^n u[-n-1]$.
2. State and prove Sampling theorem.

Unit V

1. Obtain the parallel realization of the system given by
   $$Y(n) - 3y(n-1) + 2y(n-2) = x(n).$$
2. Consider a system with impulse response $H(s) = \frac{e^s}{S+1}$; $Re(s) > -1$, Check whether the system function is casual or not.