

IC260- Signals and Systems

Tutorial-2

Date : 06/04/2012
Time : 10.00 am to 11.30 am
Max. marks : 20
Good Luck!!

- Q.1 The zero-state response of an LTIC system to an input $x(t) = 2e^{-2t}u(t)$ is $y(t) = [7e^{-2t} - 6e^{-3t}]u(t)$. Find the impulse response of the system.
Marks : 4
- Q.2 For a given LTI continuous-time system, if unit step response (let say $s(t)$) is given instead of unit impulse response then suggest solution to compute the response of system for any arbitrary input $x(t)$ in terms of $s(t)$.
Marks : 3
- Q.3 Compute the response of a LTI-CT system defined as $(D^2 + 5D + 6)y(t) = (D + 1)x(t)$ for input $x(t) = e^{-2t}u(t - 3)$. Initial conditions are $\frac{\partial y(0^-)}{\partial t} = -1$ and $y(0^-) = 2$.
Marks : 6
- Q.4 Determine and sketch the convolution of two sequences

$$x[n] = \begin{cases} -1 & : 0 \leq n \leq 4 \\ 0 & : \text{elsewhere} \end{cases}$$

and

$$h[n] = \begin{cases} \alpha^n & : 0 \leq n \leq 6 \\ 0 & : \text{elsewhere} \end{cases}$$

Assume α is greater than 1.

Marks : 7