KAKATIYA INSTITUTE OF TECHNOLOGY AND SCIENCE: WARANGAL-15

Assignment – VI

Class	:	II/IV B.Tech II-Semester
Subject	:	EC 225 - Signals & Systems (Common for ECE, EIE and EEE)
Assignment to be submitted on : 17.02.2014		

1) Evaluate the Fourier Transforms of the following Signals using properties.
   i) $e^{at}u(-t)$
   ii) $te^{-3t}u(t)$
   iii) Cos ω_0t u(t)
   iv) $e^{-2t}u(t-1)$
   v) Sin $(8t+0.1\pi)$

2) Find the inverse Fourier Transform of following Signals
   i) $X(\omega)=\dfrac{j\omega}{(3+j\omega)^2}$ ii) $X(\omega)=e^{-|\omega|}$

3) Using Fourier Transform find the convolution of the signals
   i) $x_1(t)=e^{-2t}u(t)$ *and* $x_2(t)=e^{-3t}u(t)$

4) Consider a causal LTI system with impulse response h(t) = e^{-4t} u(t). Find the output of the system for an input x(t) = 3.e^{-t} u(t).

5) The input and output of a causal LTI system are described by the differential equation
$$\frac{d^2y(t)}{dt^2}+\frac{3\,dy(t)}{dt}+2y(t)=x(t)$$
   i) Find the frequency response of the system.
   ii) Find the impulse response of the system.
   iii) What is the response of the system if $x(t)=t.e^{-t}u(t)$.