

SIGNALS & SYSTEMS - ASSIGNMENT :

KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE:: WARANGAL-506015

II/IV B.Tech (ECE, E&IE and EEE)

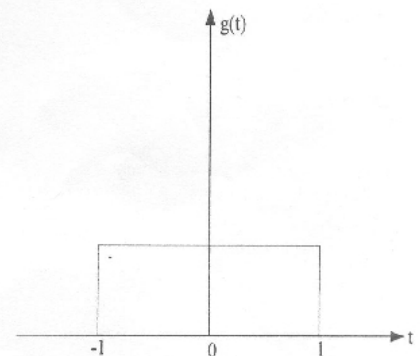
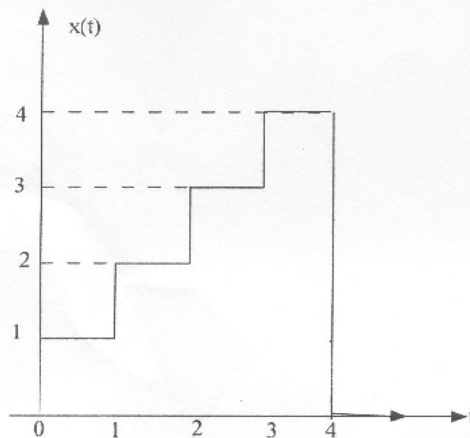
EC 225 SIGNALS & SYSTEMS

Date: 02.02.2012

To be submitted before 09.02.2012

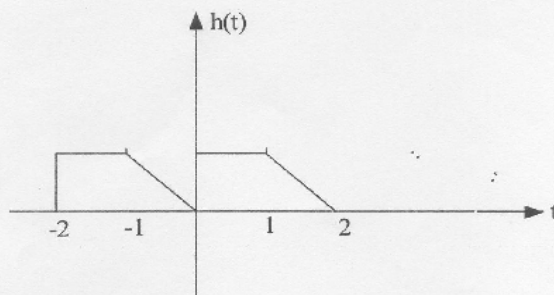
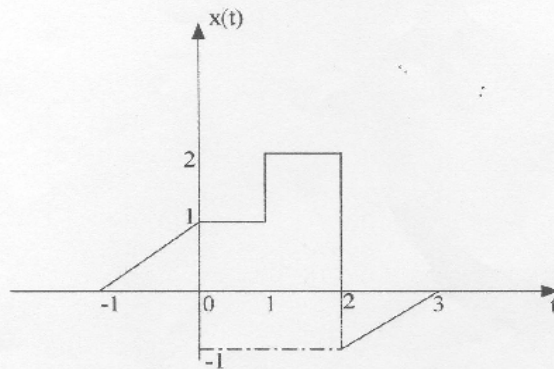
TUTORIAL SHEET-I

1. Determine whether the following functions are periodic or aperiodic if periodic find the fundamental period
 - (a) $a \sin t + b \sin 2t$
 - (b) $\cos 6t + e^{j2t}$
 - (c) $\cos t + \sin \sqrt{2} t$
 - (d) $\sin^2 t$
 - (e) $2.e^{j16\pi t} + 3.e^{-j7\pi t}$
2. Find the even and odd parts of the following signals.
 - (a) $e^{-t}u(t)$
 - (b) $(\sin \pi t + \cos \pi t)^2$
 - (c) e^{jt}
 - (d) $1+t+3t^2+5t^3+9t^4$
 - (e) $(1+t^3)\cos^3(10t)$
3. Check whether the following signals are energy or power signals
 - (i) $e^{-10t} u(t)$
 - (ii) $e^{j(2t+\pi/4)}$
 - (iii) $A[u(t+a) - u(t-a)]$
 - (iv) $r(t)$
 - (v) $\delta(t+2) - \delta(t-2)$
4. The signal $x(t)$ shown below may be viewed as superposition of four rectangular pulses. Starting with the rectangular pulse $g(t)$ shown in fig, construct this waveform and express $x(t)$ in terms of $g(t)$



5. Consider the signals $x(t)$ & $h(t)$ as shown below. Sketch & Label the following signals.

(a) $x(t) h(t+1)$ (b) $x(t) h(-t)$ (c) $x(t-1) h(1-t)$ (d) $x(1-t) h(t-1)$



6. Evaluate the following integrals

(a) $\int_{-2}^1 (t+t^2)\delta(t-3)dt$

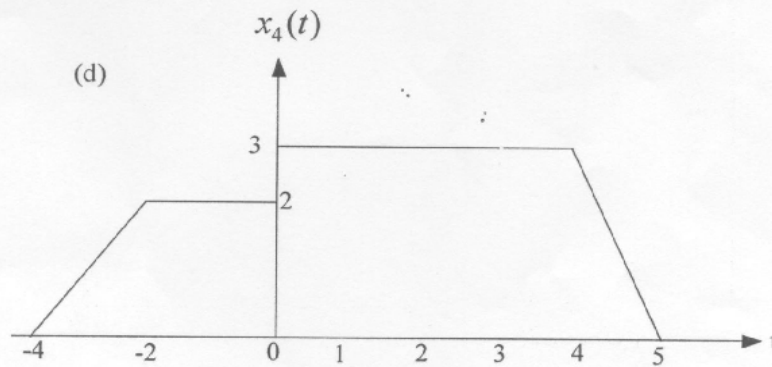
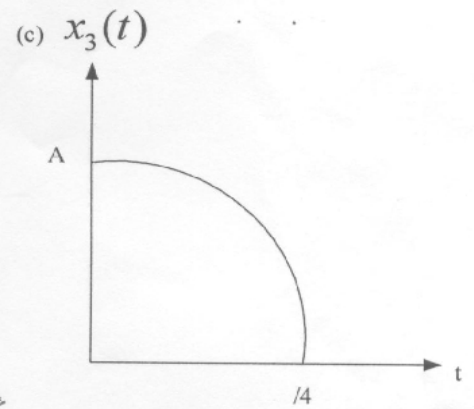
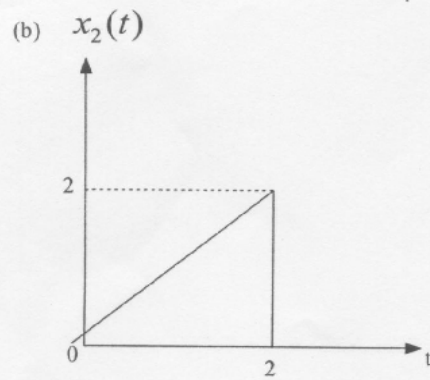
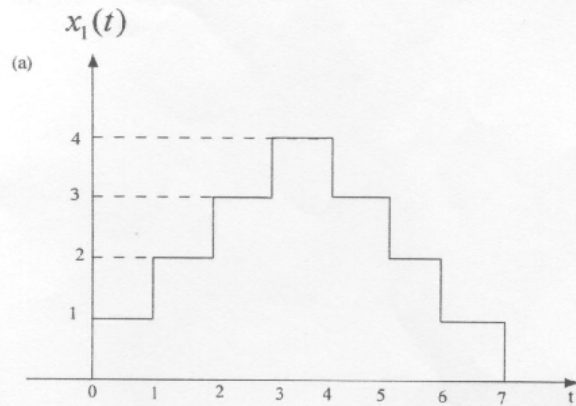
(b) $\int_{-2}^4 (t+t^2)\delta(t-3)dt$

(c) $\int_0^3 e^{t-2}\delta(2t-4)dt$

(d) $\int_{-\alpha}^{\alpha} \delta(\tau)d\tau$

7. Define a signal & how many types of signals are there. Write briefly about them, with two examples for each.
8. What is singularity function?

9. Express the signals shown in terms of singularity functions



10. Represent the following signals using singularity functions.

(a) $(t-4) [u(t-2) - u(t-4)]$

(b) $r(t) - 2r(t-1)$

(c) $u(t-2)r(t-1)$

(d) $u(t-2)r(-t-1)$

(e) $r(t-5) \sin 2\pi t$