KAKATIYA INSTITUTE OF TECHNOLOGY AND SCIENCE: WARANGAL-15

Assignment – I
Date: 25.11.2013

Class	:	II/IV B.Tech II-Semester
Subject	:	EC 225 - Signals & Systems (Common for ECE, EIE and EEE)
Assignment to be submitted on : 02.12.13		

I). Are the following periodic? If so, give the period.

S.No.	Problem	Answer
1.	$x(t) = 4 \cos(5 \pi t)$	T=2/5 Sec.
2.	$x(t) = 4 \cos(5 \pi t- \pi /4)$	T=2/5 Sec.
3.	$x(t) = 4u(t) + 2\sin(3t)$	Not Periodic
4.	$x(t) = u(t) - 1/2$	Not Periodic
5.	$x(t) = 4\cos(3t+ \pi /4) + u(t)$	Not Periodic
6.	$x(t) = 4\cos(3\pi t+ \pi/4) + 2\cos(4\pi t)$	Periodic $T_1/T_2=4/3$
7.	$x(t) = \cos(2w1t) + \cos(3w1t)$ where w1 is a specific frequency	Periodic $T_1/T_2=3/2$
8.	$x(t) = 4\cos(3\pi t + \pi /2) + 2\cos(8\pi t+ \pi/2)$	Periodic $T_1/T_2=8/3$
9.	$x(t) = 2\cos(3\pi t+ \pi /2) + 4\cos(10t- \pi/2)$	Not Periodic
10.	$x(t) = \cos(4t) + 2\sin(8t)$	Periodic $T_1/T_2=2$
11.	$x(t) = 3\cos(4t) + \sin(\pi t)$	Not Periodic
12.	$x(t) = e^{-|t|}$	Not Periodic

II). Find the even and odd parts of the following signals.

S.No.	Problem	Answer
1.	$x(t) = \cos(t) + \sin(t)+\cos(t)\sin(t)$	Even: cos(t) Odd : sin(t)+cos(t)sin(t)
2.	$x(t) = \sin(t)+ 2\sin(t) +2\sin^2(t) \cos(t)$	Even: $2\sin^2(t) \cos(t)$ Odd : sin(t)+ 2sin(t)
3.	$x(t) = 1+t \cos(t) + t^2 \sin(t)+ t^3 \sin(t) \cos(t)$	Even: $1+ t^3 \sin(t) \cos(t)$ Odd : $t \cos(t) + t^2 \sin(t)+$
4.	$x(t) = \sin 2t+\cos 4t+1$	Even: cos4t+1 Odd : sin2t
5.	$x(t) = (1+t^3)\cos^3(10t)$	Even: $\cos^3(10t)$ Odd : $t^3 \cos^3(10t)$

III). Categorize each of the following signals as an energy signal or power signal, and find the energy or power of the signal.

S.No.	Problem	Answer
1.	$x(t) = \cos(2\pi t)u(t)u(2-t)$	E = 2J
2.	$x(t) = 5\cos(\pi t) + \sin(5\pi t)$ $-\infty < t < \infty$	P = 13 w
3.	$x(t) = 5\cos(50t+\pi/3)$ $-\infty < t < \infty$	P = 12.5 w
4.	$x(t) = e^{jt\alpha} \cos(\omega t)$	P = 0.5 w
5.	$x(t) =(1+e^{-5t})u(t)$	P = 0.5 w

IV). Sketch the following signals.

1.	$x(t) = u(t+1)-2u(t)+u(t-1)$
2.	$x(t) = u(t-2) r(t-1)$
3.	$x(t) = -u(t)+u(2+t)$
4.	$x(t) =r(t+2)-r(t+1)-r(t-1)+r(t-2)$
5.	$x(t)= 2u(t)-1$
6.	$x(t)= r(t) u(2-t)$