KAKATIYA INSTITUTE OF TECHNOLOGY AND SCIENCE: WARANGAL-15

Assignment – VII: Discrete Time Signals

Class	:	II / IV B.Tech II-Semester
Subject	:	EC 225 - Signals & Systems (Common for ECE, EIE and EEE)
Submission Due on	:	03.03.2014

PROBLEM No 1

For the following signals, sketch the signals. (Scale your time axis so that a sufficient amount of the signal is being plotted.).

- $x[n] = 4\cos(\pi n)$
- $x[n] = 4\cos(\pi n-2)$
- $x[n] = 2\sin(3n)$
- $x[n] = \delta[n]$
- $x[n] = u[n-5] - u[n+1] + 8\delta[n-3]$
- $x[n] = 3(r[-n] + r[n])$
- $x[n] = 5 - r[n] - r[-n]$

PROBLEM No 2

Are the following periodic? If so, give the period

- $x[n] = 4\cos(0.5\pi n + \pi/4)$
- $x[n] = 12\cos(20n)$
- $x[n] = 10\cos(2\pi(8)n)$
- $x[n] = 10\cos(8n)$

PROBLEM No 3

A discrete-time signal $x[n]$ is shown in Fig. 1-19. Sketch and label each of the following signals.

(*a*) $x[n-2]$; (*b*) $x[2n]$; (*c*) $x[-n]$; (*d*) $x[-n+2]$

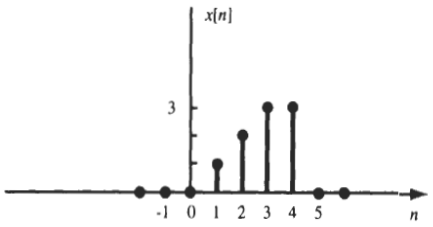

Fig. 1-19

PROBLEM No 4

Using the discrete-time signals $x_1[n]$ and $x_2[n]$ shown in Fig. 1-22, represent each of the following signals by a graph and by a sequence of numbers.

(*a*) $y_1[n] = x_1[n] + x_2[n]$; (*b*) $y_2[n] = 2x_1[n]$; (*c*) $y_3[n] = x_1[n]x_2[n]$

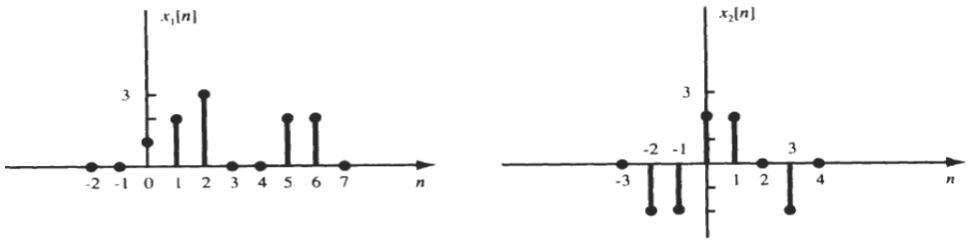

Fig. 1-22

PROBLEM No 5

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

- $X(n)=(1/2)^n u(n)$ ANS: ENERGY=1/6J
- $X(n)=\cos(\pi/4\ n)$ ANS : POWER= ½ W
- $X(n)= e^{j(\pi/2\ n+\pi/8)}$ ANS: POWER = 1W