KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
ELECTRICAL ENGINEERING DEPARTMENT

EE406- SIGNAL PROCESING
FALL SEMESTER 2003-2004

HOMEWORK #1

Due Date: Oct 4th, 2003

Question 1.

2.2 A discrete-time signal $x(n)$ is shown in Fig. P2.2. Sketch and label carefully each of the following signals.

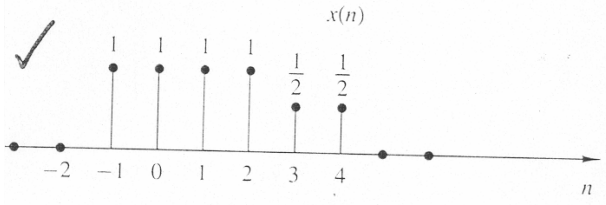

Figure P2.2

(a) $x(n-2)$ **(b)** $x(4-n)$ **(c)** $x(n+2)$ **(d)** $x(n)u(2-n)$
(e) $x(n-1)\delta(n-3)$ **(f)** $x(n^2)$ **(g)** even part of $x(n)$
(h) odd part of $x(n)$

Question 2.

Show that any signal can be decomposed into an even and an odd component. Is the decomposition unique? Illustrate your arguments using the signal

$$x(n) = \{2, 3, 4, 5, 6\}$$
$$\uparrow$$

Question 3.

A. discrete-time system can be
1. Static or Dynamic
2. Linear or nonlinear
3. Time invariant or time varying
4. Causal or noncausal
5. Stable or unstable

Examine the following systems with respect to the properties above

a) $y(n) = \cos[x(n)]$
b) $y(n) =$ Round $[x(n)]$, where Round denotes the integer part obtained by rounding.
c) $y(n) = |x(n)|$
d) $y(n) = x(n) + n\,x(n+1)$
e) $y(n) = \begin{cases} x(n), & \text{if } x(n) \geq 0 \\ 0, & \text{if } x(n) < 0 \end{cases}$

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HOMEWORK #2

Due Date: Oct 11th, 2003

Question 1.

(From Jackson Ch.2).

1. Problem 2.2
2. Problem 2.5
3. Problem 2.9
4. Problem 2.14 a, c, and h
5. Problem 2.15