

## EE 451

## Homework #1

1. Find the even and odd parts of the following sequence:

$$x[n] = \{4 \quad -2 \quad 0 \quad 1 \quad 4 \quad 8 \quad 2\}$$

↑

2. Determine the conjugate symmetric and conjugate antisymmetric parts of the following sequence:

$$x[n] = \{-2 + j4 \quad 4 - j6 \quad 4 + j6 \quad 2 + 6j \quad -8 + j2\}$$

↑

3. Determine the fundamental period of the following sequence:

$$\tilde{x}[n] = \sin(0.6\pi n + 0.2\pi)$$

4. Find the convolution of the following sequences ( $h[n] = h_1[n] \otimes h_2[n]$ ):

$$h_1[n] = 2\delta[n - 2] - 3\delta[n + 1]$$

$$h_2[n] = \delta[n - 1] + 2\delta[n + 2]$$

5. A continuous-time signal  $x(t) = \cos(3000\pi t) + 2\cos(5000\pi t)$  is sampled with a sampling frequency of 2 kHz to generate the discrete-time signal  $x[n]$ . What discrete-time frequencies are present in  $x[n]$ ?