EE 451

Homework #1

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

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

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

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

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 \( x[n] \)?