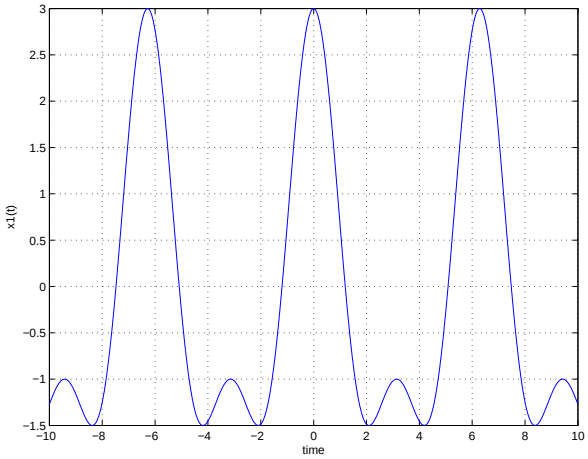
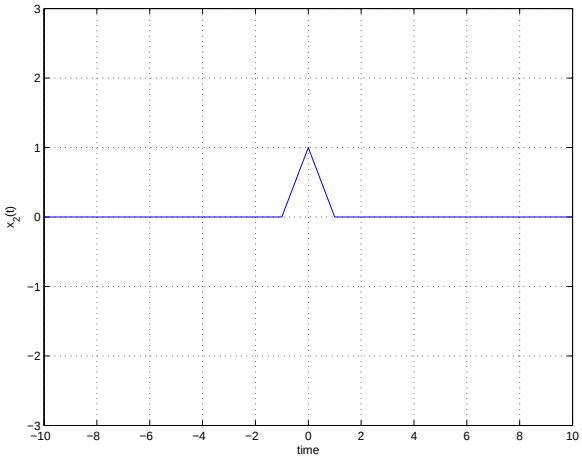
Signals & Systems
Student ID Number: _____

Unified Engineering	Spring 2008
Quiz 3	
Wednesday April 16	

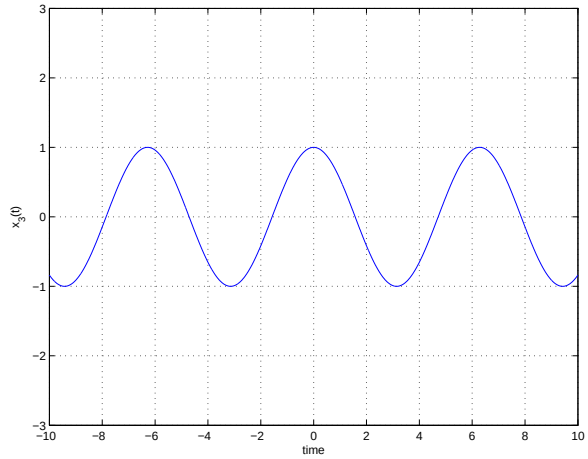
S2 [10 pt] The figures on the next two pages show five signals, $x_1(t)$ through $x_5(t)$, and five Fourier transform spectra, $X_A(j\omega)$ through $X_E(j\omega)$. Which Fourier transform corresponds to which signal? For each case give a detailed explanation of your reasoning.



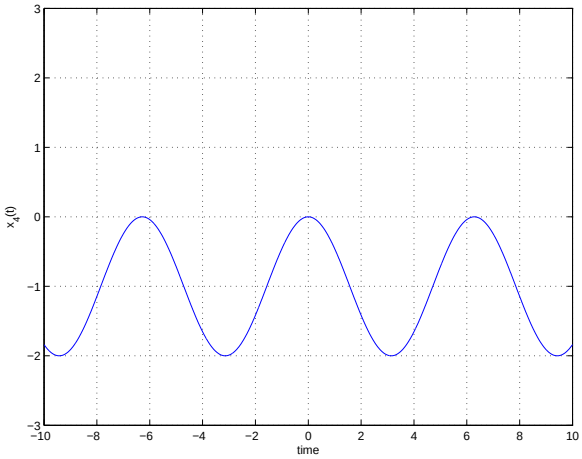
(a) $x_1(t)$



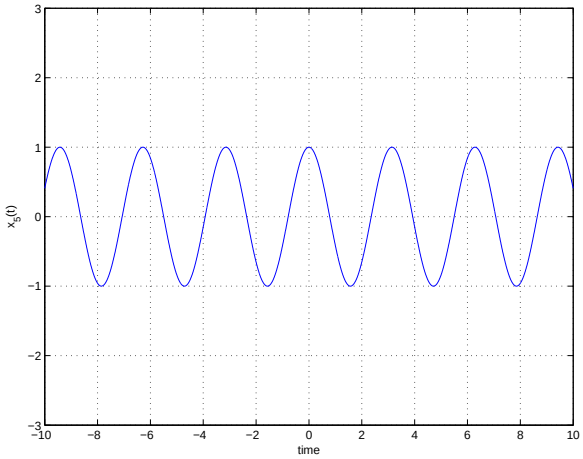
(b) $x_2(t)$



(c) $x_3(t)$

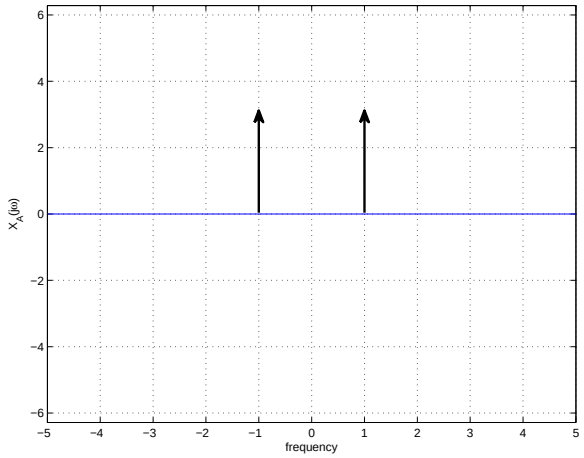


(d) $x_4(t)$

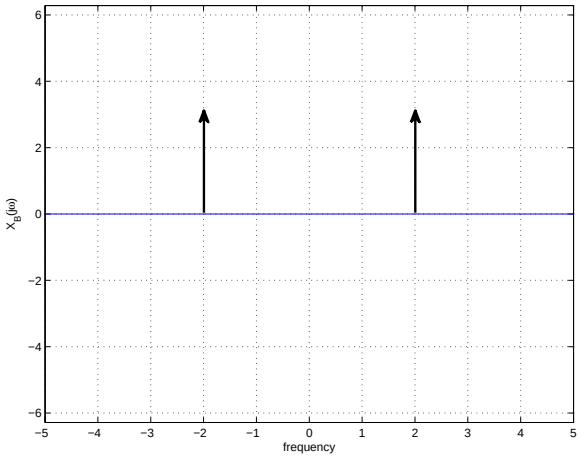


(e) $x_5(t)$

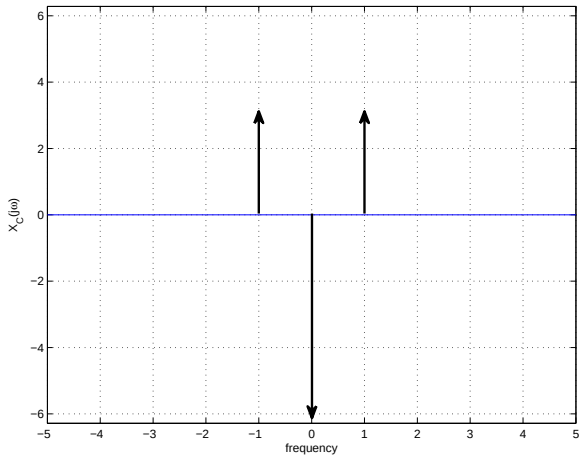
Figure 1: Question S2: Time-domain signals $x_1(t)$ through $x_5(t)$.



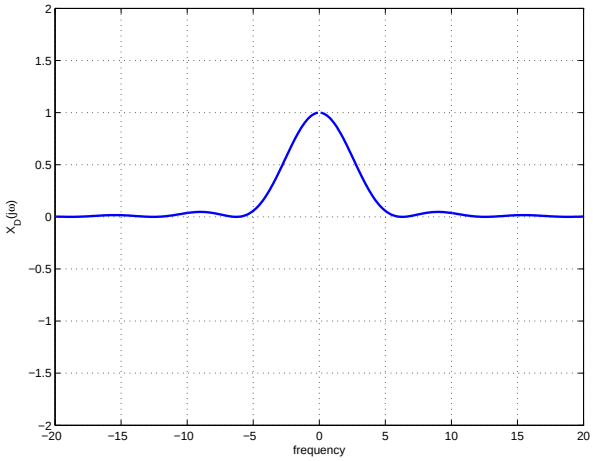
(a) $X_A(j\omega)$



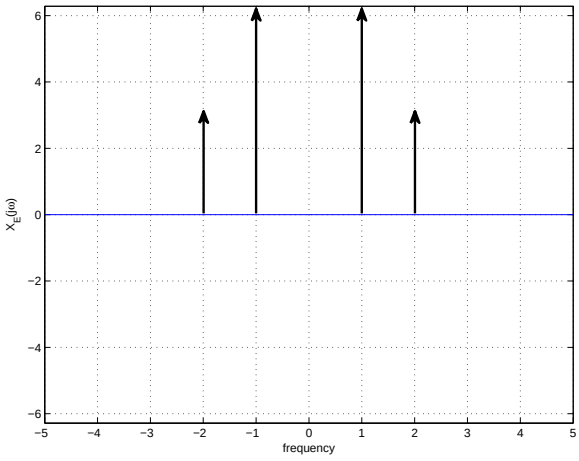
(b) $X_B(j\omega)$



(c) $X_C(j\omega)$



(d) $X_D(j\omega)$



(e) $X_E(j\omega)$

Figure 2: Question S2: Fourier transforms $X_A(j\omega)$ through $X_E(j\omega)$.

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S3 [10 pt] Consider the system shown in Figure 3 below. The system has input signal $x(t)$ and output signal $y(t)$.

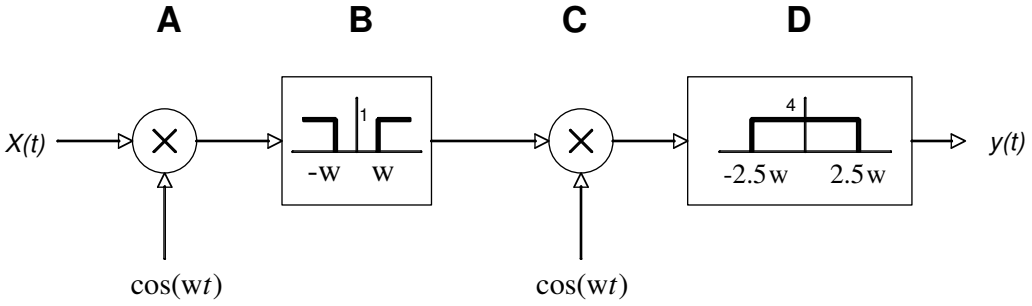

Figure 3: Question S3: system with input signal $x(t)$ and output signal $y(t)$.

(a) Identify the names of each of the components of the system, labelled A, B, C, D. For each component, explain its purpose in 1 sentence.

(b) If the input signal has the Fourier transform shown in Figure 4, sketch the Fourier transform of the output signal, $Y(j\omega)$.

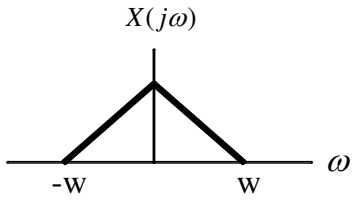

Figure 4: Question S3: Fourier transform of input signal, $X(j\omega)$.

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