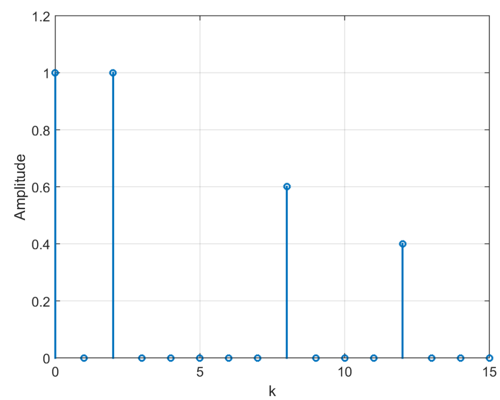
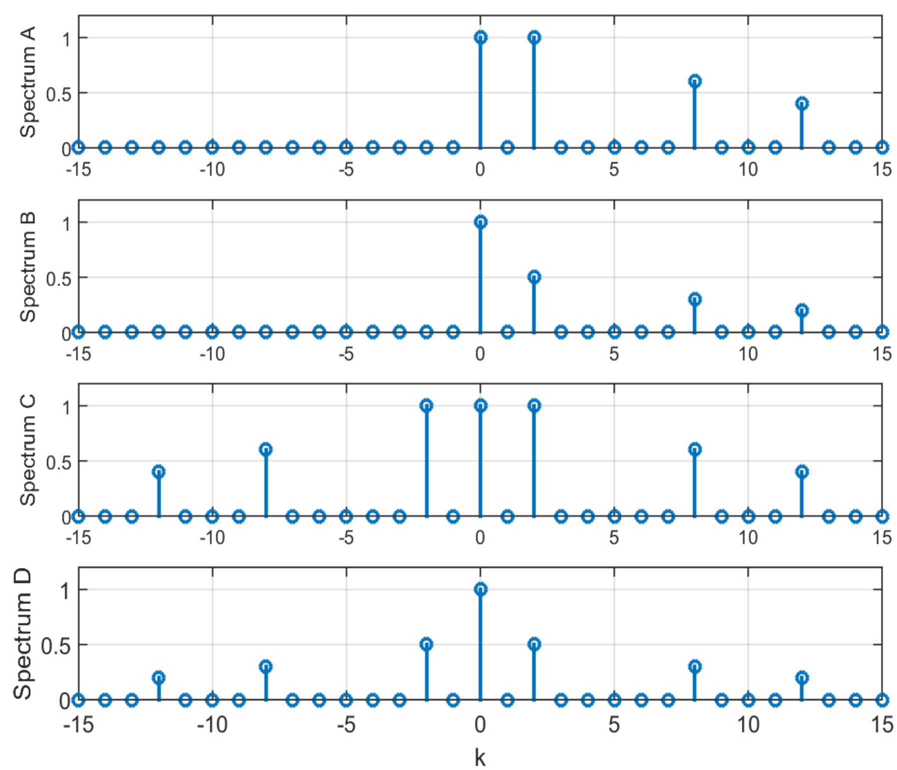
HKUSTx: ELEC1200.2x A System View of Communications: From Signals to...

6.4 QUIZ QUESTION 1 (1 point possible)

Consider a signal whose Fourier **Series** amplitude spectrum is shown below:



Consider the following Fourier **Transform** amplitude spectra:



Which of Fourier Transform amplitude spectra above corresponds to the signal?

Week 3 Quiz due Nov 16, 2015 at 15:30 UTC

6.4 Discrete Fourier Transform
Week 3 Quiz due Nov 16, 2015 at 15:30 UTC

MATLAB download and tutorials

MATLAB Sandbox

- Spectrum A
- Spectrum B
- Spectrum C ✖
- Spectrum D ✔

EXPLANATION

For the Fourier Transform, the frequency components at nonzero frequency in the Fourier Series are replicated at corresponding positive and negative locations with half the amplitude.

You have used 2 of 2 submissions

6.4 QUIZ QUESTION 2 (1/1 point)

Suppose that the Fourier Series expansion of a signal has the following amplitude and phase spectra:

$$A_k = \frac{2}{\sqrt{1.64 - 1.6\cos(2\pi k/16)}}$$

$$\phi_k = \arctan\left(\frac{0.8\sin(2\pi k/16)}{1 - 0.8\cos(2\pi k/16)}\right)$$

Find the real and imaginary parts of the Fourier Transform coefficient X_4 for the same waveform.

What is the real part to two decimal places (e.g. 3.14)?

0.61 ✔ **Answer:** 0.6098

0.61

What is the imaginary part to two decimal places?

0.49

Answer: 0.4878

0.49

EXPLANATION

Since $X_4 = \frac{A_4}{2} e^{j\phi_k}$, the real part is $\frac{A_4}{2}\cos(\phi_4)$.

Similarly, the imaginary part is $\frac{A_4}{2}\sin(\phi_4)$.

You have used 2 of 3 submissions