Week 3 Assignment 3

1. A system of two signals is fed into a linear, time-invariant system. The output signal is given by:
   \[ y(t) = x_1(t) + 3x_2(t) \]
   a. True
   b. False

2. A periodic signal can be expressed as a Fourier series:
   a. True
   b. False

3. The spectrum of a periodic signal is:
   a. A continuous function
   b. A discrete function
   c. Both continuous and discrete
   d. Neither continuous nor discrete

4. The Fourier series of a periodic signal is:
   a. A sum of sines and cosines
   b. A sum of complex exponentials
   c. A sum of polynomials
   d. A sum of sinusoids

5. Consider a signal defined as:
   \[ x(t) = \begin{cases} 1 & \text{if } 0 \leq t < 2 \\ 0 & \text{otherwise} \end{cases} \]
   a. A periodic signal
   b. A non-periodic signal
   c. A periodic signal with period 2
   d. A non-periodic signal with period 2

6. The Fourier series of a periodic signal is:
   a. A sum of sines and cosines
   b. A sum of complex exponentials
   c. A sum of polynomials
   d. A sum of sinusoids

7. A periodic signal with period T has a Fourier series given by:
   a. True
   b. False

8. The Fourier series of a periodic signal is:
   a. A sum of sines and cosines
   b. A sum of complex exponentials
   c. A sum of polynomials
   d. A sum of sinusoids

9. Consider a signal defined as:
   \[ x(t) = \begin{cases} 1 & \text{if } 0 \leq t < 2 \\ 0 & \text{otherwise} \end{cases} \]
   a. A periodic signal
   b. A non-periodic signal
   c. A periodic signal with period 2
   d. A non-periodic signal with period 2

10. The Fourier series of a periodic signal is:
    a. A sum of sines and cosines
    b. A sum of complex exponentials
    c. A sum of polynomials
    d. A sum of sinusoids

11. A periodic signal with period T has a Fourier series given by:
    a. True
    b. False

12. A periodic signal can be expressed as a Fourier series:
    a. True
    b. False

13. The Fourier series of a periodic signal is:
    a. A sum of sines and cosines
    b. A sum of complex exponentials
    c. A sum of polynomials
    d. A sum of sinusoids

14. A periodic signal with period T has a Fourier series given by:
    a. True
    b. False

15. The Fourier series of a periodic signal is:
    a. A sum of sines and cosines
    b. A sum of complex exponentials
    c. A sum of polynomials
    d. A sum of sinusoids

16. A periodic signal with period T has a Fourier series given by:
    a. True
    b. False