Assignment 3

The due date for submitting this assignment has passed. No extensions will be granted on the submission.

1. Write the filter for a 
   a. Adaptive filter
   b. Volterra filter
   c. Optimal filter
   d. Optimal Volterra filter

   Accepted answers:

2. In Volterra filter, 
   a. The output is minimized over squared error indications of the desired sequence.
   b. The subject of the model is to improve the estimate of the desired sequence.
   c. The subject of the model is to improve error indications of the desired sequence.
   d. The output is minimized over squared error indications of the desired sequence.

   Accepted answers:

3. Ideal FIR filters can be used to remove power-line interference with using power frequency. Which of the following is true for an ideal filter? 
   a. The output signal is in phase with the input signal.
   b. The output signal is shifted with time.
   c. A reference input is required.
   d. No reference input is required.

   Accepted answers:

4. Least Mean Square filter is stable when, 
   a. 0 < λ < 2
   b. λ > 1
   c. λ = 1
   d. 0.5 < λ < 1

   Accepted answers:

5. The range of the forgetting factor for a Least Mean Square adaptive filter is 
   a. 0 < λ < 1
   b. 0 < λ < 2
   c. λ > 1
   d. 0 < λ < 0.5

   Accepted answers:

6. Adaptive FIR filter can be used to remove power-line interference with using power frequency. Which of the following statements is true for adaptive filtering? 
   a. The output signal is in phase with the input signal.
   b. The output signal is shifted with time.
   c. A reference input is required.
   d. No reference input is required.

   Accepted answers:

7. The value of forgetting factor Q for the recursive least squares adaptive filter is 
   a. 0 < Q < 1
   b. Q > 1
   c. Q = 1
   d. Q > 10

   Accepted answers:

8. If the forgetting factor is large, then memory of the recursive least square algorithm is measured by 
   a. 1 + λ
   b. 1
   c. 1
   d. (1 - λ)

   Accepted answers:

9. Which of the following filter is implementable by noise and uncorrelated with the signal? 
   a. Moving filter
   b. Frequency-domain linear filter
   c. Adaptive filter
   d. Temporal FIR filter

   Accepted answers:

10. What is the relation between linear and quadratic error indications? 
    a. Multiplication of signal with signal weight
    b. Addition of signal with signal weight
    c. Covariance of signal with signal weight
    d. Noise of signal with signal weight

   Accepted answers:

11. The output of a linear FIR filter can be expressed as 
    a. Multiplication of input signal with linear weight
    b. Addition of input signal with linear weight
    c. Summation of input signal with linear weight
    d. Noise of input signal with linear weight

   Accepted answers: