Assignment-2
The due date for submitting this assignment has passed. **Due on 2016-08-02, 23:59 IST.**

Submitted assignment

1)  
Consider a set of $M$ orthogonal signal waveforms $s_m(t), 1 \leq m \leq M, 0 \leq t \leq T$ all of which have same energy $E$. Define a new set of waveforms as

$$s'_m(t) = s_m(t) - \frac{1}{M} \sum_{k=1}^{M} s_k(t), \quad 1 \leq m \leq M, 0 \leq t \leq T$$

Then the $M$ signal waveforms $\{s'_m(t)\}$ have

- Equal energy
- Different energy
- Depends on number of orthogonal signals
- None of these

*No, the answer is incorrect.*
Score: 0

Accepted Answers:

2)  
In the above question, if $E=8$ Joule then for 8 signals waveform $\{s'_m(t)\}$ have same energy, which will be (in Joule)

*No, the answer is incorrect.*
Score: 0

Accepted Answers:

3) In the above question, the correlation coefficient is

-0.2
4) The frequency response of Hilbert transformer is

- Odd symmetric
- Even symmetric
- Neither even nor odd symmetric
- None of these

No, the answer is incorrect.
Score: 0
Accepted Answers:
-1/7

5) Consider the three waveforms

\[ f_1(t) = 0.5 \ u(t) - u(t-2) + 0.5 \ u(t-4) \]
\[ f_2(t) = 0.5 \ u(t) - 0.5 \ u(t-4) \]
\[ f_3(t) = 0.5 \ u(t) - u(t-1) + u(t-2) - u(t-3) + 0.5u(t-4) \]

The correct option about their orthonormality

- \( f_1(t) \) and \( f_2(t) \) are not orthonormal to each other
- \( f_1(t) \) and \( f_3(t) \) are not orthonormal to each other
- \( f_3(t) \) and \( f_2(t) \) are not orthonormal to each other
- \( f_1(t), f_2(t) \) and \( f_3(t) \) are orthonormal to each other

No, the answer is incorrect.
Score: 0
Accepted Answers:
\( f_1(t), f_2(t) \) and \( f_3(t) \) are orthonormal to each other

6) In the above question, if the signal

\[ X(t) = \begin{cases} -1 & 0 \leq t < 1 \\ 1 & 1 \leq t < 3 \\ -1 & 3 \leq t < 4 \end{cases} \]

Then,
7) In the above question X(t) can be represented in terms of \( f_1(t) \), \( f_2(t) \) or \( f_3(t) \) as

- \( X(t) = 0.5 \ f_1(t) + f_2(t) + 2f_3(t) \)
- \( X(t) = f_1(t) + f_2(t) + 2f_3(t) \)
- \( X(t) = 5f_1(t) + f_2(t) + 5f_3(t) \)
- None of these

No, the answer is incorrect.
Score: 0
Accepted Answers:
None of these

8) Consider the three waveforms

\[ s_1(t) = 2u(t) - 3u(t-1) + u(t-4) \]
\[ s_2(t) = -2u(t) + 3u(t-1) - u(t-3) \]
\[ s_3(t) = u(t) - 2u(t-1) + 2u(t-2) - 2u(t-3) + u(t-4) \]
\[ s_4(t) = u(t) - 3u(t-1) + 4u(t-3) - 2u(t-4) \]

The dimensionality of waveforms is

No, the answer is incorrect.
Score: 0
Accepted Answers:

(Answer: String) 4

3 points

9) In the above question, Use the basis functions to represent the for waveforms by vectors \( s_1, s_2, s_3, s_4 \)
\[ s_1 = [2 \ -1 \ -1 \ -1] \]
\[ s_2 = [2 \ 1 \ 1 \ 0] \]
\[ s_3 = [1 \ -1 \ 1 \ -1] \]
\[ s_4 = [1 \ -2 \ -2 \ 2] \]
\[ s_1 = [2 \ 1 \ 1 \ -1] \]
\[ s_2 = [2 \ 1 \ 1 \ 2] \]
\[ s_3 = [1 \ -1 \ 1 \ -1] \]
\[ s_4 = [1 \ -2 \ -2 \ 2] \]
\[ s_1 = [2 \ 0 \ -1 \ -1] \]
\[ s_2 = [2 \ 1 \ 1 \ 0] \]
\[ s_3 = [1 \ 0 \ 1 \ -1] \]
\[ s_4 = [1 \ -2 \ 0 \ 2] \]

No, the answer is incorrect.
Score: 0
Accepted Answers:
\[ s_1 = [2 \ -1 \ -1 \ -1] \]
\[ s_2 = [2 \ 1 \ 1 \ 0] \]
\[ s_3 = [1 \ -1 \ 1 \ -1] \]
\[ s_4 = [1 \ -2 \ -2 \ 2] \]

10. The distance \( d_{1,2} \) between vectors 1 and 2 is

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) 5

2 points