Assignment 8

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment. **Due on 2018-10-03, 23:59 IST.**

1) Consider a Bernoulli \( \frac{1}{4} \) source with Hamming distortion measure with \( D = .11 \). What is the rate distortion function for this source?

- -1
- 0
- 0.31
- 1

*No, the answer is incorrect.*

**Score:** 0

**Accepted Answers:**

- 0.31

2) Considering the same source as given in Q1. What will be the rate distortion function for \( D = 0.5 \)?

- 0
- 0.47
- 0.53
- 1

*No, the answer is incorrect.*

**Score:** 0

**Accepted Answers:**

- 0

3) Consider a memoryless Gaussian \( \mathcal{N}(0, 2) \) source with mean squared-error distortion with \( D = \frac{1}{2} \). What is the rate distortion function for this source?

**1 point**
4) Consider a memoryless Gaussian $\mathcal{N}(0, 6)$ source with mean squared-error distortion with $D = 8$. What is the rate distortion function for this source?

-1  
-0.5  
0  
0.5

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

5) Consider a source $X$ uniformly distributed on the set $\{1, 2, \ldots, 16\}$. Find the approximate rate distortion function for this source with Hamming distortion $D=0.5$?

-1  
0  
1  
2

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

6) Considering the same source as given in Q5. What will be the rate distortion function for $D=1$?

-1  
0  
1  
None of the above

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

7) Consider a Gaussian random variable $X \sim \mathcal{N}(0, 1)$ with squared error distortion measure. The optimum reproduction points for 1 bit quantization are $\pm \sqrt{\frac{4}{\pi}}$. What is the expected distortion?

0  
0.5  
0.36  
1

No, the answer is incorrect.  
Score: 0
Let, $X_i \sim \mathcal{N}(0, \sigma_i^2), \ i = 1, 2, 3$ be independent Gaussian random variables with $\sigma_1^2 = 1, \sigma_2^2 = 2, \sigma_3^2 = 3$. Let, distortion measure be $d(x^3, \hat{x}^3) = \sum_{i=1}^{3} (x_i - \hat{x}_i)^2$. What is the rate distortion function for $D=6$?

- 0
- 2
- 6
- None of the above

No, the answer is incorrect.
Score: 0

9) Following the problem of Q8. What will be the rate distortion function for $D=5$?

- 0
- 0.2
- 0.3
- 0.5

No, the answer is incorrect.
Score: 0

10) Consider joint distribution of $(X, \hat{X})$ for erasure distortion of a binary source as shown in figure below.

What will be the rate distortion function for $D>1$?

- $1 - \alpha$
- $\alpha$
- 0
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers: 0