

STA 4322
Spring 2020
Quiz 1

Full Name: _____

On my honor, I have neither given nor received unauthorized aid on this quiz

Signature: _____

This is a 10 minute quiz. There are 5 multiple choice problems, each having EXACTLY ONE correct answer. You may *not* use any books, other references, or text-capable electronic devices.

1. If Y_1, Y_2, \dots, Y_n is a random sample from a population with mean μ and variance σ^2 , and \bar{Y} denotes the sample mean, then the MSE of \bar{Y} is given by
 - (a) σ^2 .
 - (b) n .
 - (c) $\frac{\sigma^2}{n}$.
 - (d) $n\sigma^2$.
2. The sample mean estimator \bar{Y} (in Problem 1 above) is unbiased. This statement is
 - (a) True.
 - (b) False.
3. In Problem 1 above, $E[\bar{Y}^2]$ is given by
 - (a) μ^2 .
 - (b) $\mu^2 + \frac{\sigma^2}{n}$.
 - (c) σ^2 .
 - (d) $\frac{\sigma^2}{n}$.
4. In Problem 1 above, let

$$\hat{\sigma}^2 = \frac{1}{n} \sum_{i=1}^n (Y_i - \bar{Y})^2.$$

Then $E[\hat{\sigma}^2]$ is given by

- (a) σ^2 .
 - (b) $n\sigma^2$.
 - (c) $\frac{n}{n-1}\sigma^2$.
 - (d) $\frac{n-1}{n}\sigma^2$.
5. In Problem 1 above, the probability distribution of \bar{Y} is always Poisson. This statement is
 - (a) True.
 - (b) False.