Biased and Unbiased Point Estimates Quiz

1.

A certain statistic $\hat{d}$ is being used to estimate a population parameter D. The expected value of $\hat{d}$ is not equal to D. What property does $\hat{d}$ exhibit?

(A) The sampling distribution of $\hat{d}$ is normal.

(B) The sampling distribution of $\hat{d}$ is binomial.

(C) The sampling distribution of $\hat{d}$ is uniform.

(D) $\hat{d}$ is unbiased.

(E) $\hat{d}$ is biased.

2.

Which of the following conditions will create a biased estimator of a population parameter?

(A) The sampling distribution of the estimator is skewed to the left.

(B) The sampling distribution of the estimator is skewed to the right.

(C) The sampling distribution of the estimator is not the same shape as the distribution of the population parameter.

(D) The expected value of the estimator is not equal to the population parameter.

(E) The variability of the sampling distribution of the estimator is not equal to the variability of the population parameter.

3. Samples G and H were selected from the same population of quantitative data and the mean of each sample was determined. The mean of sample G is equal to the mean of the population.

Which of the following statements must be true?

I. The mean of sample H must also be equal to the population mean.
II. The mean of sample G, $\bar{x}_{\mathrm{G}}$, is a point estimator for the mean of the population.
III. The mean of sample H, $\bar{x}_{\mathrm{H}}$, is a point estimator for the mean of the population.

(A) I only

(B) II only

(C) III only

(D) I and II

(E) II and III

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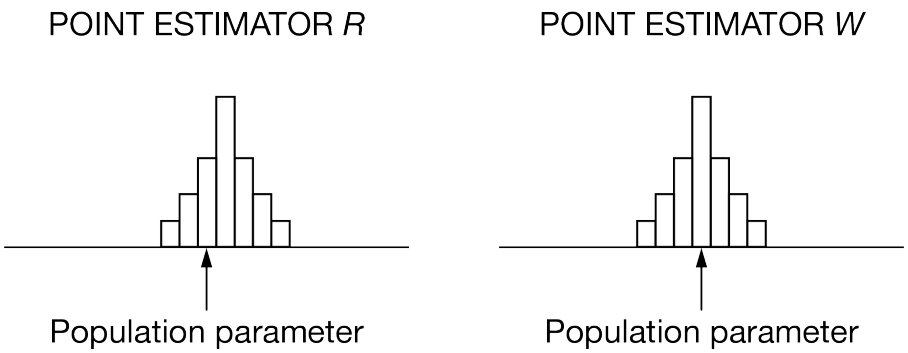
4. The following graphs show the sampling distributions for two different point estimators, R and W, of the same population parameter.



Which of the following statements is true?

(A) Both R and W are unbiased.

(B) Both R and W are biased.

(C) R is biased, and W is unbiased.

(D) R is unbiased, and W is biased.

(E) The assessment of bias is not possible, because the sampling distributions display too much variability.

5. A certain statistic will be used as an unbiased estimator of a parameter. Let J represent the sampling distribution of the estimator for samples of size 40, and let K represent the sampling distribution of the estimator for samples of size 100.

Which of the following must be true about J and K ?

(A) The expected value of J will be equal to the expected value of K, and the variability of J will be equal to the variability of K.

(B) The expected value of J will be greater than the expected value of K, and the variability of J will be greater than the variability of K.

(C) The expected value of J will be greater than the expected value of K, and the variability of J will be less than the variability of K.

(D) The expected values of J and K will be equal, and the variability of J will equal the variability of K.

(E) The expected values of J and K will be equal, and the variability of J will be greater than the variability of K.

6. The statistic $\bar{x}$ is used as an estimator for which of the following?

(A) n

(B) s

(C) σ

(D) μ

(E) z