# Statistics MCQs – Estimation Part 1

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1. Which of the following statements is not correct?

a. When an interval estimate is associated with a degree of confidence that it actually includes the population parameter of interest, it is referred to as a confidence interval

b. If the population mean and population standard deviation are both known, one can make probability statements about individual x values taken from the population

c. If the population mean and population standard deviation are both known, one can use the central limit theorem and make probability statements about the means of samples taken from the population

d. If the population mean is unknown, one can use sample data as the basis from which to make probability statements about the true (but unknown) value of the population mean

e. when sample data are used for estimating a population mean, sampling error will not be present since the observed sample statistic will not differ from the actual value of the population parameter

Answer: E

2.Inferential statistics is the:

a. process of using a population parameter to estimate the values for sample statistics

b. process of using sample statistics to estimate population parameters

c. process which allows the researcher to determine the exact values for population parameters

d. process that eliminates the problem of sampling error

e. branch of statistics involving using population parameters to estimate sampling distributions

Answer: B

3. Which of the following statements are correct?

a. a point estimate is an estimate of the range of a population parameter

b. a point estimate is an unbiased estimator if its standard deviation is the same as the actual value of the population standard deviation

c. a point estimate is a single value estimate of the value of a population parameter

d. all of the above statements are correct

e. none of the above statements are correct

Answer: C

4. A point estimator is defined as:

a. the average of the sample values

b. the average of the population values

c. a single value that is the best estimate of an unknown population parameter

d. a single value that is the best estimate of an unknown sample statistic

e. a number which can be used to estimate a point in time which is unknown

Answer: C

5. Which of the following statements is/are correct?

a. an interval estimate is an estimate of the range of possible values for a population parameter

b. an interval estimate describes a range of values that is likely not to include the actual population parameter

c. an interval estimate is an estimate of the range for a sample statistic

d. all of the statements above are correct

e. none of the statements above are correct

Answer: A

6. A confidence interval is defined as:

a. a point estimate plus or minus a specific level of confidence

b. a lower and upper confidence limit associated with a specific level of confidence

c. an interval that has a 95% probability of containing the population parameter

d. a lower and upper confidence limit that has a 95% probability of containing the population parameter

e. an interval used to infer something about an unknown sample statistic value

Answer: B

7. The term $1 - \alpha$ refers to the:

a. probability that a confidence interval does not contain the population parameter

b. the level of confidence minus one

c. the level of confidence

d. the level of confidence plus one

e. the level of significance

Answer: C

8. A 95% confidence interval for the population mean is calculated to be 75.29 to 81.45. If the confidence level is reduced to 90% , the confidence interval will:

a. become narrower

b. remain the same

c. become wider

d. double in size

e. most likely no longer include the true value of the population mean

Answer: A

9. A 95% confidence interval for the population mean is calculated to be 75.29 to 81.45. If the confidence level is increased to 98% , the confidence interval will:

a. become narrower

b. remain the same

c. become wider

d. double in size

e. most likely no longer include the true value of the population mean

Answer: C

10.In the formula for the confidence interval, $z_{\alpha/2}$ is part of the formula. What does the subscript $\alpha/2$ refer to?

a. the level of confidence

b. the level of significance

c. the probability that the confidence interval will contain the population mean

d. the probability that the confidence interval will not contain the population mean

e. the area in the lower tail or upper tail of the sampling distribution of the sample mean

Answer: E

11. Which of the statements below completes the following statement correctly? The larger the level of confidence used in constructing a confidence interval estimate of the population mean, the:

a. smaller the probability that the confidence interval will contain the population mean

b. the smaller the value of $z_{\alpha/2}$

c. the narrower the confidence interval

d. the wider the confidence interval

e. the more the width of the confidence interval remains the same

Answer: D

12. Which one of the statements below is correct?

a. If n, the sample size, increases, the confidence interval becomes wider

b. A 90% confidence interval for the population mean is narrower than a 95% confidence interval for the population mean

c. As the population standard deviation increases, the confidence interval becomes narrower

d. If $\alpha = 0.01$, it implies that we are 1% confident that the population mean will lie between the confidence limits

e. none of the above statements is correct

Answer: B

13. The boundaries of a confidence interval are called:

a. Confidence levels

b. The test statistics

c. The degrees of confidence

d. The confidence limits

e. Significance levels

Answer: D

14. What value of z would you use to calculate the 80% confidence interval for a population mean, given that you know the population standard deviation, the sample size and the sample mean of your sample?

a. z = 1.96

b. z = 2.58

c. z = 0.84

d. z = 1.28

e. z = 1.645

Answer: D

15. Which of the following statements is false with regards to the width of a confidence interval?

a. The sample mean from which the interval is constructed is located half way between the boundaries of the confidence interval

b. The width of the interval increases when the sample size is decreased

c. The width of the interval decreases when the significance level is increased

d. The width of the interval decreases when the sample mean is decreased

e. The width of the interval increases when the confidence level is increased

Answer: D

16. After constructing a confidence interval estimate for a population mean, you believe that the interval is useless because it is too wide.In order to correct this problem, you need to:

a.Increase the population standard deviation

b.Increase the sample size

c.Increase the level of confidence

d.Increase the sample mean

e. Decrease the sample size

Answer: B

17. The problem with relying on a point estimate of a population parameter is that the point estimate

a. has no variance

b. might be unbiased

c. might not be relatively efficient

d. does not tell us how close or far the point estimate might be from the parameter

e. may not be consistent

Answer: D

18. A federal auditor for nationally chartered banks from a random sample of 100 accounts found that the average demand deposit balance at the First National Bank of a small town was R549.82. If the auditor needed a point estimate for the population mean for all accounts at this bank, what would she use?

a. The average of R549.82 for this sample.

b. The average of R54.98 for this sample.

c. There is no acceptable value available.

d. She would survey the total of all accounts and determine the mean.

e. The mean would be impossible to calculate without further information

Answer: A

19. Which one of the statements below is correct?

a. If the significance level is equal to 0.1, it implies that we are 10% confident that the population mean will lie between the confidence limits

b. If the sample size increases the confidence interval becomes wider

c. As the population standard deviation increases, the confidence interval becomes narrower

d. A 90% confidence interval for the population mean is narrower than a 95% confidence interval for the population mean

e.Increasing the significance level increases the width of the confidence interval

Answer: D

20. Sand is packed into bags which are then weighed on scales. It is known that if full bags of sand are intended to weigh $\mu$ kg, then the weight recorded by the scales will be normally distributed with a mean $\mu$ kg and a standard deviation of 0.36kg. A particular bag of sand

was weighed four times and the weight recorded each time was different. The sample mean weight was recorded as 34.7kg. What is a 95% confidence interval for the true weight of the full bag of sand?

a. 34.35 to 35.05kg

b. 35.85 to 36.55kg

c. 34.21 to 35.19kg

d. 34.48 to 34.92kg

e. 37.75 to 38.45kg

Answer: A