QUIZ TIME

Bio-statistics lec5

Done by:

Rahaf alfogaha

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طـب الأسـنـان

1. The main purpose of computing a confidence interval is to:
A. Identify the exact value of the population parameter
B. Determine the probability of committing a Type I error
C. Provide a range of likely values for the parameter
D. Reduce the sample size error to zero
E. Ensure the standard deviation is known
Answer: C

2. In a standard normal distribution, the critical value c for a 95% confidence level is:
A. 1.65
B. 1.96
C. 2.33
D. 2.58
E. 0.95
Answer: B

3. If the population standard deviation (σ) is unknown and replaced with the sample standard deviation (s), the sampling distribution follows:
A. Normal distribution
B. Poisson distribution
C. t-distribution
D. Chi-square distribution
E. Binomial distribution
Answer: C

4. Which of the following will result in a narrower confidence interval, assuming all else is constant?
A. Increasing the confidence coefficient
B. Decreasing the sample size
C. Increasing the sample size
D. Using a t-distribution instead of a z-distribution
E. Increasing the population variance
Answer: C

5. When the sample size is large (n>30), and the population is not perfectly normal, the confidence interval formula using z-scores is approximately valid due to:
A. Law of Large Numbers
B. Central Limit Theorem
C. P-value threshold
D. Chebyshev's inequality
E. Regression assumption
Answer: B

6. A 95% confidence interval for the mean with known σ is given by:

A. $\bar{x} \pm Z_{\alpha/2} \frac{\sigma}{n}$

B. $\bar{x} \pm Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$

C. $\bar{x} \pm t_{\alpha/2} \frac{s}{\sqrt{n}}$

D. $\bar{x} \pm t_{\alpha/2} \frac{\sigma}{\sqrt{n}}$

E. $\bar{x} \pm Z_{\alpha/2} \frac{s}{n}$

Answer: B

7. Which statement about the t-distribution is TRUE?

A. It is symmetric but not continuous

B. It has lighter tails than the normal distribution

C. It approaches the normal distribution as degrees of freedom increase

D. It is indexed by the standard deviation of the population

E. It is only valid when n > 30

Answer: C

8. If we choose a smaller α for our confidence interval, the interval will:

A. Become narrower and more precise

B. Become narrower and less precise

C. Become wider and less precise

D. Become wider and more precise

E. Remain unchanged

Answer: C

9. Which of the following represents the correctinterpretation of a 95% confidence interval?

A. There is a 95% probability that the sample mean lies within the calculated range.

B. 95% of all possible sample means will equalthe true population mean.

C. If we repeat the study many times, 95% of the calculated intervals will contain the truepopulation mean.

D. The probability that the true mean lies outsidethe interval is 5%.

E. The sample mean will be within the range 95% of the time.

Answer: C

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C. If we repeat the study many times, 95% of the calculated intervals will contain the true population mean.

D. The probability that the true mean lies outside the interval is 5%.

E. The sample mean will be within the range 95% of the time.

Answer: C

10. Which of the following statements about p-values is FALSE?
A. A p-value < 0.05 suggests the result is statistically significant.
B. A p-value measures the probability that results occurred by chance alone.
C. p<0.05 always means the result is clinically significant.
D. p<0.05 means the observed result would occur by chance no more than 5 times in 100.
E. Statistical significance does not necessarily imply clinical significance.
Answer: C

11. A sample of n = 49 dental students has a mean exam score of $\bar{x}$ = 76.5. The population standard deviation is known to be σ = 4.2.
Calculate the 95% confidence interval for the population mean.
A. (75.3, 77.7)
B. (75.1, 77.9)
C. (75.0, 78.0)
D. (75.8, 77.2)
E. (75.5, 77.5)
Answer: B

12. In a study on tooth enamel thickness, a sample of n = 16 teeth was measured. The sample mean was $\bar{x}$ = 2.45 mm, and the sample standard deviation was s = 0.12 mm. Assuming normality, compute the 99% confidence interval for the population mean using the t-distribution.
A. (2.37, 2.53)
B. (2.36, 2.54)
C. (2.38, 2.52)
D. (2.40, 2.50)
E. (2.35, 2.55)
Answers: B

13. A researcher measures the plaque index of n = 25 patients and finds $\bar{x}$ = 1.82, s = 0.25.
Find the 90% confidence interval for the true mean plaque index using the t-distribution.
A. (1.74, 1.90)
B. (1.75, 1.89)
C. (1.76, 1.88)
D. (1.73, 1.91)
E. (1.78, 1.86)
Answer: A

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