

Interval estimation

MULTIPLE CHOICE

1. The absolute value of the difference between the point estimate and the population parameter it estimates is
- the standard error
 - the sampling error
 - precision
 - the error of confidence

ANS: B

PTS: 1

TOP: Interval Estimation

2. A population has a standard deviation of 50. A random sample of 100 items from this population is selected. The sample mean is determined to be 600. At 95% confidence, the margin of error is
- 5
 - 9.8
 - 650
 - 609.8

ANS: B

PTS: 1

TOP: Interval Estimation

3. For the interval estimation of μ when σ is known and the sample is large, the proper distribution to use is
- the normal distribution
 - the t distribution with n degrees of freedom
 - the t distribution with n + 1 degrees of freedom
 - the t distribution with n + 2 degrees of freedom

ANS: A

PTS: 1

TOP: Interval Estimation

4. The value added and subtracted from a point estimate in order to develop an interval estimate of the population parameter is known as the
- confidence level
 - margin of error
 - parameter estimate
 - interval estimate

ANS: B

PTS: 1

TOP: Interval Estimation

5. In order to use the normal distribution for interval estimation of μ when σ is known and the sample is very small, the population
- must be very large
 - must have a normal distribution
 - can have any distribution
 - must have a mean of at least 1

ANS: B

PTS: 1

TOP: Interval Estimation

6. The z value for a 97.8% confidence interval estimation is
- 2.02
 - 1.96
 - 2.00
 - 2.29

ANS: D PTS: 1 TOP: Interval Estimation

7. After computing a confidence interval, the user believes the results are meaningless because the width of the interval is too large. Which one of the following is the best recommendation?
- Increase the level of confidence for the interval.
 - Decrease the sample size.
 - Increase the sample size.
 - Reduce the population variance.

ANS: C PTS: 1 TOP: Interval Estimation

8. In general, higher confidence levels provide
- wider confidence intervals
 - narrower confidence intervals
 - a smaller standard error
 - unbiased estimates

ANS: A PTS: 1 TOP: Interval Estimation

9. A sample of 225 elements from a population with a standard deviation of 75 is selected. The sample mean is 180. The 95% confidence interval for μ is
- 105.0 to 225.0
 - 175.0 to 185.0
 - 100.0 to 200.0
 - 170.2 to 189.8

ANS: D PTS: 1 TOP: Interval Estimation

10. A random sample of 144 observations has a mean of 20, a median of 21, and a mode of 22. The population standard deviation is known to equal 4.8. The 95.44% confidence interval for the population mean is
- 15.2 to 24.8
 - 19.200 to 20.800
 - 19.216 to 20.784
 - 21.2 to 22.8

ANS: B PTS: 1 TOP: Interval Estimation

Exhibit 8-1

In order to estimate the average time spent on the computer terminals per student at a local university, data were collected for a sample of 81 business students over a one-week period. Assume the population standard deviation is 1.8 hours.

11. Refer to Exhibit 8-1. The standard error of the mean is
- 7.50
 - 0.39
 - 2.00
 - 0.20

ANS: D PTS: 1 TOP: Interval Estimation

12. Refer to Exhibit 8-1. If the sample mean is 9 hours, then the 95% confidence interval is
- 7.04 to 110.96 hours
 - 7.36 to 10.64 hours
 - 7.80 to 10.20 hours
 - 8.61 to 9.39 hours

ANS: D PTS: 1 TOP: Interval Estimation

Exhibit 8-2

A random sample of 121 automobiles traveling on an interstate showed an average speed of 65 mph. From past information, it is known that the standard deviation of the population is 22 mph.

13. Refer to Exhibit 8-2. The standard error of the mean is
- 22.00
 - 96.60
 - 4.24
 - 2.00

ANS: D PTS: 1 TOP: Interval Estimation

14. Refer to Exhibit 8-2. The 96.6% confidence interval for μ is
- 63.00 to 67.00
 - 60.76 to 69.24
 - 61.08 to 68.92
 - 60.00 to 80.00

ANS: B PTS: 1 TOP: Interval Estimation

Exhibit 8-3

The manager of a grocery store has taken a random sample of 100 customers. The average length of time it took these 100 customers to check out was 3.0 minutes. It is known that the standard deviation of the population of checkout times is one minute.

15. Refer to Exhibit 8-3. The standard error of the mean equals
- 0.001
 - 0.010
 - 0.100
 - 1.000

ANS: C PTS: 1 TOP: Interval Estimation

16. Refer to Exhibit 8-3. The 95% confidence interval for the true average checkout time (in minutes) is
- 3:00 to 5:00
 - 1.36 to 4.64
 - 1.00 to 5.00
 - 2.804 to 3.196

ANS: D

PTS: 1

TOP: Interval Estimation

Exhibit 8-4

In order to estimate the average electric usage per month, a sample of 81 houses was selected, and the electric usage was determined. Assume a population standard deviation of 450-kilowatt hours.

17. Refer to Exhibit 8-4. At 95% confidence, the size of the margin of error is
- 1.96
 - 50
 - 98
 - 42

ANS: C

PTS: 1

TOP: Interval Estimation

18. When s is used to estimate σ , the margin of error is computed by using
- normal distribution
 - t distribution
 - the mean of the sample
 - the mean of the population

ANS: B

PTS: 1

TOP: Interval Estimation

19. As the number of degrees of freedom for a t distribution increases, the difference between the t distribution and the standard normal distribution
- becomes larger
 - becomes smaller
 - stays the same
 - None of these alternatives is correct.

ANS: B

PTS: 1

TOP: Interval Estimation

20. In interval estimation, the t distribution is applicable only when
- the population has a mean of less than 30
 - the sample standard deviation is used to estimate the population standard deviation
 - the variance of the population is known
 - the standard deviation of the population is known

ANS: B

PTS: 1

TOP: Interval Estimation

21. From a population that is not normally distributed and whose standard deviation is not known, a sample of 6 items is selected to develop an interval estimate for the mean of the population (μ).
- The normal distribution can be used.
 - The t distribution with 5 degrees of freedom must be used.
 - The t distribution with 6 degrees of freedom must be used.
 - The sample size must be increased.

ANS: D

PTS: 1

TOP: Interval Estimation

22. The t value for a 95% confidence interval estimation with 24 degrees of freedom is
- 1.711
 - 2.064
 - 2.492
 - 2.069

ANS: B PTS: 1 TOP: Interval Estimation

23. A sample of 20 items from a population with an unknown σ is selected in order to develop an interval estimate of μ . Which of the following is **not** necessary?
- We must assume the population has a normal distribution.
 - We must use a t distribution.
 - Sample standard deviation must be used to estimate σ .
 - The sample must have a normal distribution.

ANS: D PTS: 1 TOP: Interval Estimation

24. When constructing a confidence interval for the population mean and the standard deviation of the sample is used, the degrees of freedom for the t distribution equals
- n-1
 - n
 - 29
 - 30

ANS: A PTS: 1 TOP: Interval Estimation

25. The following random sample from a population whose values were normally distributed was collected.

10 12 18 16

The 80% confidence interval for μ is

- 12.054 to 15.946
- 10.108 to 17.892
- 10.321 to 17.679
- 11.009 to 16.991

ANS: D PTS: 1 TOP: Interval Estimation

Exhibit 8-5

A random sample of 64 SAT scores of students applying for merit scholarships showed an average of 1400 with a standard deviation of 240.

26. Refer to Exhibit 8-5. The “t” value for this interval estimation is
- 1.96
 - 1.998
 - 1.64
 - 1.28

ANS: B PTS: 1 TOP: Interval Estimation

27. Refer to Exhibit 8-5. The 95% confidence interval for the SAT scores is
- 1340.05 to 1459.95
 - 1400 to 1459.95
 - 1340.05 to 1400
 - 1400 to 1600

ANS: A PTS: 1 TOP: Interval Estimation

Exhibit 8-6

A sample of 75 information system managers had an average hourly income of \$40.75 with a standard deviation of \$7.00.

28. Refer to Exhibit 8-6. The standard error of the mean is
- 80.83
 - 7
 - 0.8083
 - 1.611

ANS: C PTS: 1 TOP: Interval Estimation

29. Refer to Exhibit 8-6. The 95% confidence interval for the average hourly wage of all information system managers is
- 40.75 to 42.36
 - 39.14 to 40.75
 - 39.14 to 42.36
 - 30 to 50

ANS: C PTS: 1 TOP: Interval Estimation

30. As the sample size increases, the margin of error
- increases
 - decreases
 - stays the same
 - increases or decreases depending on the size of the mean

ANS: B PTS: 1 TOP: Interval Estimation

31. The sample size needed to provide a margin of error of 2 or less with a .95 probability when the population standard deviation equals 11 is
- 10
 - 11
 - 116
 - 117

ANS: D PTS: 1 TOP: Interval Estimation

32. For which of the following values of P is the value of $P(1 - P)$ maximized?
- $P = 0.99$
 - $P = 0.90$
 - $P = 0.01$
 - $P = 0.50$

ANS: D PTS: 1 TOP: Interval Estimation

33. Using an $\alpha = 0.04$ a confidence interval for a population proportion is determined to be 0.65 to 0.75. If the level of significance is decreased, the interval for the population proportion
- becomes narrower
 - becomes wider
 - does not change
 - remains the same

ANS: B

PTS: 1

TOP: Interval Estimation

34. In a random sample of 144 observations, $\bar{p} = 0.6$. The 95% confidence interval for P is
- 0.52 to 0.68
 - 0.144 to 0.200
 - 0.60 to 0.70
 - 0.50 to 0.70

ANS: A

PTS: 1

TOP: Interval Estimation

35. A random sample of 1000 people was taken. Four hundred fifty of the people in the sample favored Candidate A. The 95% confidence interval for the true proportion of people who favors Candidate A is
- 0.419 to 0.481
 - 0.40 to 0.50
 - 0.45 to 0.55
 - 1.645 to 1.96

ANS: A

PTS: 1

TOP: Interval Estimation

36. We are interested in conducting a study in order to determine what percentage of voters of a state would vote for the incumbent governor. What is the minimum size sample needed to estimate the population proportion with a margin of error of 0.05 or less at 95% confidence?
- 200
 - 100
 - 58
 - 385

ANS: D

PTS: 1

TOP: Interval Estimation