

Exam

Name _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) A population has a standard deviation $\sigma = 20.2$. How large a sample must be drawn so that a 98% confidence interval for μ will have a margin of error equal to 4.2? 1) _____
- A) 11 B) 226 C) 126 D) 5

Provide an appropriate response.

- 2) In a survey of 1,000 television viewers, 40% said they watch network news programs. For a 90% confidence level, the margin of error for this estimate is 2.5%. If we want to be 95% confident, how will the margin of error change? 2) _____
- A) Since more confidence requires a more narrow interval, the margin of error will be smaller.
B) Since more confidence requires a wider interval, the margin of error will be smaller.
C) Since more confidence requires a more narrow interval, the margin of error will be larger.
D) Since more confidence requires a wider interval, the margin of error will be larger.
E) There is not enough information to determine the effect on the margin of error.

Construct the requested confidence interval from the supplied information.

- 3) A sociologist develops a test to measure attitudes about public transportation, and 27 randomly selected subjects are given the test. Their mean score is 76.2 and their standard deviation is 21.4. Construct the 95% confidence interval for the mean score of all such subjects. 3) _____
- A) (67.7, 84.7)
B) (74.6, 77.8)
C) (69.2, 83.2)
D) (64.2, 88.2)
E) (64.2, 83.2)
- 4) For a particular diamond mine, 77% of the diamonds fail to qualify as "gemstone grade". A random sample of 112 diamonds is analysed. Find the probability that more than 81% of the sample diamonds fail to qualify as gemstone grade. 4) _____
- A) 0.8729 B) 0.1562 C) 0.8438 D) 0.1271

Interpret the confidence interval.

- 5) A credit union took a random sample of 40 accounts and obtained the following 90% confidence interval for the mean checking account balance at the institution: $\$2197 < \mu(\text{balance}) < \3846 . 5) _____
- A) About 9 out of 10 people have a checking account balance between \$2197 and \$3846.
 - B) If we took random samples of checking accounts at this credit union, about nine out of ten of them would produce this confidence interval.
 - C) We are 90% confident that the mean checking account balance at this credit union is between \$2197 and \$3846, based on this sample.
 - D) We are 90% confident that the mean checking account balance in the U.S. is between \$2197 and \$3846.
 - E) We are 90% sure that the mean balance for checking accounts in the sample was between \$2197 and \$3846.
- 6) How many unpopped kernels are left when you pop a bag of microwave popcorn? Quality control personnel at Yummy Popcorn take a random sample of 50 bags of popcorn. They pop each bag in a microwave and then count the number of unpopped kernels. The following interval is produced: 6) _____
- t-interval for μ : with 99% Confidence,
 $11 < \mu(\text{unpopped}) < 25$
- A) About 99% of the sampled bags had between 11 and 25 unpopped kernels.
 - B) 99% of all samples of Yummy popcorn will produce this confidence interval.
 - C) We are 99% confident that the average number of unpopped kernels in microwave popcorn bags is between 11 and 25.
 - D) The average number of unpopped kernels in a bag of Yummy popcorn is between 11 and 25 kernels.
 - E) We are 99% sure that the average number of unpopped kernels in bags of Yummy brand popcorn is between 11 and 25 kernels.

Use the given degree of confidence and sample data to construct a confidence interval for the population proportion.

- 7) When 293 college students are randomly selected and surveyed, it is found that 114 own a car. 7) _____
Construct a 99% confidence interval for the percentage of all college students who own a car.
- A) (32.3%, 45.5%)
 - B) (34.2%, 43.6%)
 - C) (17.4%, 60.4%)
 - D) (33.3%, 44.5%)
 - E) (31.6%, 46.2%)
- 8) Of 230 employees selected randomly from one company, 10.43% of them commute by carpooling. 8) _____
Construct a 90% confidence interval for the percentage of all employees of the company who carpool.
- A) (7.11%, 13.7%)
 - B) (6.48%, 14.4%)
 - C) (5.23%, 15.6%)
 - D) (5.73%, 15.6%)
 - E) (5.73%, 15.1%)

- 9) Of 81 adults selected randomly from one town, 64 have health insurance. Construct a 90% confidence interval for the percentage of all adults in the town who have health insurance. 9) _____
- A) (73.0%, 85.0%)
 - B) (68.5%, 89.6%)
 - C) (67.4%, 90.7%)
 - D) (70.1%, 87.9%)
 - E) (71.6%, 86.5%)

- 10) Of 132 adults selected randomly from one town, 25 of them smoke. Construct a 99% confidence interval for the percentage of all adults in the town who smoke. 10) _____
- A) (11.0%, 25.6%)
 - B) (11.0%, 26.9%)
 - C) (10.2%, 27.7%)
 - D) (12.3%, 25.6%)
 - E) (13.3%, 24.6%)

- 11) A certain car model has a mean gas mileage of 31 miles per gallon (mpg) with a standard deviation 3 mpg. A pizza delivery company buys 35 of these cars. What is the probability that the average mileage of the fleet is between 30.9 and 31.2 mpg? 11) _____
- A) 0.4207 B) 0.7690 C) 0.2310 D) 0.6517

Determine the margin of error in estimating the population parameter.

- 12) Based on a sample of size 49, a 95% confidence interval for the mean score of all students on an aptitude test is from 64.3 to 69.7. 12) _____
- A) 0.05
 - B) 0.76
 - C) 5.4
 - D) 2.7
 - E) Not enough information is given.

- 13) A sample of 37 light bulbs had a mean lifetime of 584 hours. A 95% confidence interval for the population mean was $579.2 < \mu < 588.8$. 13) _____

Which one of the following statements is the correct interpretation of the results?

- A) None of these are true.
- B) The probability that the population mean is between 579.2 hours and 588.8 hours is 0.95.
- C) We are 95% confident that the mean lifetime of all the bulbs in the population is between 579.2 hours and 588.8 hours.
- D) 95% of the light bulbs in the sample had lifetimes between 579.2 hours and 588.8 hours

19) The following display from a TI-84 Plus calculator presents a 95% confidence interval. 19) _____

ZInterval (41.032, 52.538) $\bar{x} = 46.785$ $n = 42$
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Fill in the blanks: We are _____ confident that the population mean is between _____ and _____.

A) 95%, 0, 46.785

B) 5%, 41.032, 52.538

C) 95%, 41.032, 52.538

D) 5%, 0, 46.785

Answer Key

Testname: SPRING 2017 6 AND 7 EXERCISES

- 1) C
- 2) D
- 3) A
- 4) B
- 5) C
- 6) E
- 7) E
- 8) A
- 9) E
- 10) C
- 11) C
- 12) D
- 13) C
- 14) D
- 15) C
- 16) B
- 17) A
- 18) D
- 19) C