Exams

Name___________________________________

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

1) A college admissions officer takes a simple random sample of 80 entering freshmen and computes their mean mathematics SAT score to be 469. Assume the population standard deviation is $\sigma = 95$.

Construct a 90% confidence interval for the mean mathematics SAT score for the entering freshmen class.

A) (455, 483)  
B) (467, 471)  
C) (452, 486)  
D) (374, 564)

2) 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.

A) 0.8438  
B) 0.1562  
C) 0.1271  
D) 0.8729

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

3) When 293 college students are randomly selected and surveyed, it is found that 114 own a car.

Construct a 99% confidence interval for the percentage of all college students who own a car.

A) (34.2%, 43.6%)  
B) (32.3%, 45.5%)  
C) (33.3%, 44.5%)  
D) (17.4%, 60.4%)  
E) (31.6%, 46.2%)

4) 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.

A) (11.0%, 25.6%)  
B) (11.0%, 26.9%)  
C) (12.3%, 25.6%)  
D) (13.3%, 24.6%)  
E) (10.2%, 27.7%)

5) 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.

A) (71.6%, 86.5%)  
B) (70.1%, 87.9%)  
C) (67.4%, 90.7%)  
D) (73.0%, 85.0%)  
E) (68.5%, 89.6%)
Provide an appropriate response.

6) 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?
   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 larger.
   C) Since more confidence requires a wider interval, the margin of error will be smaller.
   D) Since more confidence requires a more narrow interval, the margin of error will be larger.
   E) There is not enough information to determine the effect on the margin of error.

7) The weights of 6-week-old poults (juvenile turkeys) are normally distributed with a mean 9.1 pounds and standard deviation 2.4 pound(s). Find the 13th percentile of the weights.
   A) 7.03 lb  B) 6.39 lb  C) 7.67 lb  D) 5.75 lb

8) In a survey of 314 registered voters, 156 of them wished to see Mayor Waffleskate lose her next election. Construct a 95% confidence interval for the proportion of registered voter who want to see Mayor Waffleskate defeated.
   A) (0.469, 0.525)  B) (0.441, 0.552)  C) 0.450, 0.543)  D) (0.388, 0.605)

9) A sample of size \( n = 50 \) is drawn from a population whose standard deviation is \( \sigma = 14.5 \). Find the margin of error for a 90% confidence interval for \( \mu \).
   A) 3.37  B) 0.89  C) 0.80  D) 2.05

10) A sample of size \( n = 15 \) is drawn from an approximately normal population whose standard deviation is \( \sigma = 5.5 \). The sample mean is \( \bar{x} = 40.8 \). Construct a 90% confidence interval for \( \mu \).
    A) (39.80, 41.80)  B) 38.46, 43.14  C) (40.80, 43.14)  D) (30.28, 51.32)

Interpret the confidence interval.

11) 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.
   A) If we took random samples of checking accounts at this credit union, about nine out of ten of them would produce this confidence interval.
   B) We are 90% sure that the mean balance for checking accounts in the sample was between \$2197 and \$3846.
   C) About 9 out of 10 people have a checking account balance between \$2197 and \$3846.
   D) We are 90% confident that the mean checking account balance in the U.S. is between \$2197 and \$3846.
   E) We are 90% confident that the mean checking account balance at this credit union is between \$2197 and \$3846, based on this sample.
12) 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:
\[ t\text{-interval for } \mu \text{ : with } 99\% \text{ Confidence,} \]
\[ 11 < \mu(\text{unpopped}) < 25 \]
A) About 99% of the sampled bags had between 11 and 25 unpopped kernels.
B) We are 99% confident that the average number of unpopped kernels in microwave popcorn bags is between 11 and 25.
C) We are 99% sure that the average number of unpopped kernels in bags of Yummy brand popcorn is between 11 and 25 kernels.
D) The average number of unpopped kernels in a bag of Yummy popcorn is between 11 and 25 kernels.
E) 99% of all samples of Yummy popcorn will produce this confidence interval.

13) A population has a standard deviation \( \sigma = 20.2 \). How large a sample must be drawn so that a 98% confidence interval for \( \mu \) will have a margin of error equal to 4.2?
A) 5 \quad \text{B) 126} \quad \text{C) 226} \quad \text{D) 11}

14) A bottler of drinking water fills plastic bottles with a mean volume of 994 milliliters (mL) and standard deviation 5 mL. The fill volumes are normally distributed. What proportion of bottles have volumes less than 995 mL?
A) 0.5793 \quad \text{B) 0.5596} \quad \text{C) 0.9974} \quad \text{D) 1.0000}

15) A sample of size 40 will be drawn from a population with mean 98 and standard deviation 24. Find the 21st percentile of \( \bar{x} \).
A) 94.9 \quad \text{B) 93.8} \quad \text{C) 91.4} \quad \text{D) 90.8}

16) The mean annual income for people in a certain city (in thousands of dollars) is 40, with a standard deviation of 35. A pollster draws a sample of 48 people to interview. What is the probability that the sample mean income is between 34 and 45 (thousands of dollars)?
A) 0.8389 \quad \text{B) 0.1611} \quad \text{C) 0.7219} \quad \text{D) 0.2781}

17) 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?
A) 0.2310 \quad \text{B) 0.4207} \quad \text{C) 0.6517} \quad \text{D) 0.7690}
Determine the margin of error in estimating the population parameter.

18) 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.
   A) 2.7
   B) 0.05
   C) 0.76
   D) 5.4
   E) Not enough information is given.

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

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ZInterval
(41.032, 52.538)
x = 46.785
n = 42
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Fill in the blanks: We are ________ confident that the population mean is between _______ and _______.
   A) 5%, 41.032, 52.538  
   B) 5%, 0, 46.785  
   C) 95%, 41.032, 52.538  
   D) 95%, 0, 46.785

20) At a cell phone assembly plant, 81% of the cell phone keypads pass inspection. A random sample of 97 keypads is analysed. Find the probability that more than 85% of the sample keypads pass inspection.
   A) 0.8413  
   B) 0.8577  
   C) 0.1423  
   D) 0.1587

21) 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.

Which one of the following statements is the correct interpretation of the results?
   A) The probability that the population mean is between 579.2 hours and 588.8 hours is 0.95.
   B) 95% of the light bulbs in the sample had lifetimes between 579.2 hours and 588.8 hours
   C) None of these are true.
   D) We are 95% confident that the mean lifetime of all the bulbs in the population is between 579.2 hours and 588.8 hours.
Construct the requested confidence interval from the supplied information.

22) 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.

A) (74.6, 77.8)
B) (67.7, 84.7)
C) (64.2, 83.2)
D) (64.2, 88.2)
E) (69.2, 83.2)
Answer Key
Testname: 6 AND 7 IN CLASS EXERCISES

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