Practice 08

7.1 Confidence Intervals for Mean Sigma Known
7.2 Confidence Intervals for Mean Sigma Unknown

1) What value of $z_{\alpha/2}$ is used in the 90% confidence interval of a normal distribution? 1) _____
A) 1.96 B) 1.28 C) 2.57 D) 1.65

2) Find the critical value $z_{\alpha/2}$ needed to construct a(n) 80% confidence interval. 2) _____
A) 0.84 B) 1.08 C) 2.10 D) 1.28

3) A sample of size $n = 10$ is drawn from an approximately normal population whose standard deviation is $\sigma = 12.5$. The sample mean is $\bar{x} = 50.9$. Construct a 99% confidence interval for μ. 3) _____
A) $50.90 < \mu < 61.08$ B) $43.61 < \mu < 58.19$
C) $40.72 < \mu < 61.08$ D) $48.02 < \mu < 53.78$

4) A sample of 35 different payroll departments found that employees worked an average of 240.6 days a year. If the population standard deviation is 18.8 days, find the 90% confidence interval for the average number of days μ worked by all employees who are paid through payroll departments. 4) _____
A) $230.9 < \mu < 250.3$ B) $235.4 < \mu < 245.8$
C) $236.8 < \mu < 244.4$ D) $232.4 < \mu < 248.8$

5) The average score for 100 teenage boys playing a certain computer game was 100,000 points per player. If the standard deviation of the population is 20,000 points, find the 95% confidence interval of the mean score for all teenage boys. 5) _____
A) $98{,}000 < \mu < 102{,}000$ B) $97{,}000 < \mu < 103{,}000$
C) $95{,}000 < \mu < 105{,}000$ D) $96{,}080 < \mu < 103{,}920$

6) A college admissions officer takes a simple random sample of 80 entering freshmen and computes their mean mathematics SAT score to be 455. Assume the population standard deviation is $\sigma = 113$. 6) _____

Construct a 95% confidence interval for the mean mathematics SAT score for the entering freshmen class.
A) $342 < \mu < 568$ B) $440 < \mu < 470$
C) $453 < \mu < 457$ D) $430 < \mu < 480$

7) If a population has a standard deviation of 10, what is the minimum number of samples that need to be averaged in order to be 95% confident that the average of the means is within 2 of the true mean? 7) _____

A) 97 B) 20 C) 10 D) 191

8) Find $t_{\alpha/2}$ when $n = 25$ for the 95% confidence interval for the mean. 8) _____

A) 1.30 B) 2.63 C) 2.06 D) 1.71

9) Find $t_{\alpha/2}$ for $n = 18$ and a 99% confidence interval. 9) _____

A) 2.567 B) 2.898 C) 2.878 D) 2.552

10) A sample of size $n = 14$ has a sample mean $\bar{x} = 11.9$ and sample standard deviation $s = 2.1$. Construct a 99% confidence interval for the population mean μ. 10) _____

A) $10.4 < \mu < 13.4$ B) $10.7 < \mu < 13.1$

C) $11.4 < \mu < 12.4$ D) $10.2 < \mu < 13.6$

11) A sample of 81 tobacco smokers who recently completed a new smoking-cessation program were asked to rate the effectiveness of the program on a scale of 1 to 10, with 10 corresponding to "completely effective" and 1 corresponding to "completely ineffective". The average rating was 5.6 and the standard deviation was 4.6. 11) _____

Construct a 95% confidence interval for the mean score.

A) $5.2 < \mu < 6.0$ B) $5.1 < \mu < 6.1$ C) $0 < \mu < 5.6$ D) $4.6 < \mu < 6.6$

12) A state representative wishes to estimate the mean number of women representatives per state legislature. A random sample of 17 states is selected, and the number of women representatives is shown. Based on the sample, what is the point estimate of the mean? Find the 90% confidence interval of the mean population. (*Note* : The population mean is actually 32.2.) 12) _____

4	32	33	34	24
27	15	48	25	16
19	31	18	39	21
58	130			

A) Point Estimate : 32.2
CI : $21.95 < \mu < 45.58$

B) Point Estimate : 33.8
CI : $21.99 < \mu < 45.58$

C) Point Estimate : 32.2
CI : $21.99 < \mu < 45.54$

D) Point Estimate : 33.8
CI : $21.97 < \mu < 45.63$

Answer Key
Testname: STA2023_PRACTICE08

1) D
2) D
3) C
4) B
5) D
6) D
7) A
8) C
9) B
10) D
11) D
12) D