

Chapter 8

- 1) If $\bar{X} = 6800$, $\sigma = 600$, $n = 36$,
construct 95% confidence interval estimate for the population mean,
 μ . The 95% confidence interval estimate for the population mean, μ , is

$$\boxed{} \leq \mu \leq \boxed{}$$

(Round to the nearest whole numbers as needed.)

- 2) The manager of a company wants to collect data to estimate the average sales of his employees. A simple random sample of 100 employees has been collected out of 500 employees. At a 99.9% confidence, suppose the mean estimate for sales by his employees is between Rs.15,000 and Rs.35,000. Suppose that the population mean sales by the employee is Rs.14,000. Is this correct? Explain.

Choose the correct answer below.

- The mean estimate by the employee is correct because the value of μ is the midpoint of the confidence interval estimate.
- The mean estimate by the employee is incorrect because the value of μ is not the midpoint of the confidence interval estimate.
- The mean estimate by the employee is correct because the value of μ is included within the confidence interval estimate.
- The mean estimate by the employee is incorrect because the value of μ is not included within the confidence interval estimate.

- 3) A researcher selects a simple random sample of $n = 100$ users of a social media website from a population of over 100 million registered users. After analyzing the sample, she states that she has 95% confidence that the mean time spent on the site per day is between 15 and 57 minutes. Explain the meaning of this statement.

Choose the correct answer below.

- During any given day there is a 95% chance that the mean time all registered users spent on the site was between 15 and 57 minutes.
- There is a 95% chance that a randomly selected registered user spends between 15 and 57 minutes on the site per day.
- Of the over 100 million registered users, 95% of them spend between 15 and 57 minutes on the site per day.
- One is 95% confident that the true mean time all registered users spend on the site per day is between 15 and 57 minutes.

- 4) You are working as an assistant to the dean of research at your university. The dean wants to survey members of the alumni who obtained their degrees 5 years ago to learn what their starting salaries were in their first full-time job after receiving their degrees. A sample of 200 alumni is to be randomly selected from the list of 2,400 graduates in that class. If the dean's goal is to construct a 95% confidence interval estimate for the population mean starting salary, why is it not possible that you will be able to use the expression $\bar{X} \pm Z_{0.025}\sigma_n$ for this purpose? Explain. Why is it not possible to use the equation?

- The sample mean \bar{X} might not be a whole number, but the number of students must be.
- The population standard deviation σ is not known.
- The sample size n is too large to use this expression.
- The sample size n is Assume the population is normally distributed with

5) Find the critical value of $t_{\alpha,df}$ from the following information:

a) $\alpha=0.025$ and degrees of freedom=30

b) $\alpha=0.05$ and $n=15$

c) $1-\alpha=0.95$ and $n=6$

a) $t =$

(Type an integer or a decimal rounded to four decimal places as needed.)

b) $t =$

(Type an integer or a decimal rounded to four decimal places as needed.)

c) $t =$

(Type an integer or a decimal rounded to four decimal places as needed.)

6) Assume the population is normally distributed with $\bar{X} = 96.43$ $S = 10.6$ and $n = 20$.

Construct a 90% confidence interval estimate for the population mean, μ .

The 90% confidence interval estimate for the population mean, μ , is

$\leq \mu \leq$.

(Type integers or decimals rounded to two decimal places as needed.)

7) Determine the upper-tail critical value $t_{\alpha/2}$ in each of the following circumstances.

$1-\alpha=90\%$, $n=10$

$t =$

(Round to four decimal places as needed.)

8) Assuming that the population is normally distributed, construct a 95% confidence interval for the population mean, based on the following sample size of $n=7$. 1, 2, 3, 4, 5, 6, and 7. In the given data, Find a 95 confidence interval for the population mean, using the formula.

$\leq \mu \leq$

(Round to four decimal places as needed.)

9) If you want to be 99% confident of estimating the population mean to within a sampling error of ± 35 and the standard deviation is assumed to be 140, what sample size is required?

The sample size required is

(Round up to the nearest integer.)

10) In survey of 1000 social media users, 78% said it was okay to friend

co-workers, but 60% said that was not okay to be – friend your boss, Construct a 90% confidence

interval estimate for the population proportion of social media users who would say it okay to friend

your co-workers

$\leq \mu \leq$

(Round to four decimal places as needed.)

11) if $n = 400$ and $X = 25$, construct a 99% confidence interval estimate for the population proportion

$\leq \mu \leq$

(Round to four decimal places as needed.)