

Topics: Confidence Intervals

1. For each of the following statements, indicate whether it is True/False. If false, explain why.
 - I. The sample size of the survey should at least be a fixed percentage of the population size in order to produce representative results.
 - **False: -**
There is no fixed size assigned to select sample from population. But, minimum of 30% of total population is preferable.
 - II. The sampling frame is a list of every item that appears in a survey sample, including those that did not respond to questions.
 - **False:-**
Sampling frame is just a list of all data from the population. Then the data from sampling frame are selected for sample survey.
 - III. Larger surveys convey a more accurate impression of the population than smaller surveys.
 - **True:-**
More the survey, less the error margin and more accurate impression we get from give data set.
2. *PC Magazine* asked all of its readers to participate in a survey of their satisfaction with different brands of electronics. In the 2004 survey, which was included in an issue of the magazine that year, more than 9000 readers rated the products on a scale from 1 to 10. The magazine reported that the average rating assigned by 225 readers to a Kodak compact digital camera was 7.5. For this product, identify the following:
 - A. The population
 - B. The parameter of interest
 - C. The sampling frame
 - D. The sample size
 - E. The sampling design
 - F. Any potential sources of bias or other problems with the survey or sample
 - A. The population is 9000.**
 - B. Kodak Compact Digital Camera with rating of 7.5.**
 - C. Sampling frame are all the readers who participated in the survey.**
 - D. 225 readers.**
 - E. Voluntary Response.**

F. Yes, there is a possibility that rating of the Kodak Camera can be biased.

Such as people who loves the product very much or people who doesn't like the product can cause unreliable data.

3. For each of the following statements, indicate whether it is True/False. If false, explain why.

I. If the 95% confidence interval for the average purchase of customers at a department store is \$50 to \$110, then \$100 is a plausible value for the population mean at this level of confidence.

• **True**

Confidence Interval is a range of possible values which is represented as Interval.

II. If the 95% confidence interval for the number of moviegoers who purchase concessions is 30% to 45%, this means that fewer than half of all moviegoers purchase concessions.

• **False:**

We can't exactly estimate moviegoers lies in interval of 30% to 45%. There are possibilities that they lie outside the confidence interval.

III. The 95% Confidence-Interval for μ only applies if the sample data are nearly normally distributed.

• **False.**

If the sample data is larger enough there is possibility that population may appear in sample data.

4. What are the chances that $\bar{X} > \mu$?

A. $\frac{1}{4}$

B. $\frac{1}{2}$

C. $\frac{3}{4}$

D. 1

Option B is Answer

There are always 50% chances that sample mean can be greater than mean.

5. In January 2005, a company that monitors Internet traffic (WebSideStory) reported that its sampling revealed that the Mozilla Firefox browser launched in 2004 had grabbed a 4.6% share of the market.
 - I. If the sample were based on 2,000 users, could Microsoft conclude that Mozilla has a less than 5% share of the market?
 - **95% confidence interval for proportions of people who uses Mozilla are [0.039– 0.055]**
 - II. WebSideStory claims that its sample includes all the daily Internet users. If that's the case, then can Microsoft conclude that Mozilla has a less than 5% share of the market?
 - **Yes. If the sample size is same as population, we could conclude that Mozilla has less than 5% share of market.**

6. A book publisher monitors the size of shipments of its textbooks to university bookstores. For a sample of texts used at various schools, the 95% confidence interval for the size of the shipment was 250 ± 45 books. Which, if any, of the following interpretations of this interval are correct?
 - A. All shipments are between 205 and 295 books.
 - **False**
There interval for 90% is [205 – 295] is for 90% , not for 100.
 - B. 95% of shipments are between 205 and 295 books.
 - **Incorrect.**
The interval doesn't describe individual shipments.
 - C. The procedure that produced this interval generates ranges that hold the population mean for 95% of samples.
 - **Correct.**
95% of intervals created in this way contain the true population mean.
 - D. If we get another sample, then we can be 95% sure that the mean of this second sample is between 205 and 295.
 - **False**
Interval cannot describe the mean
 - E. We can be 95% confident that the range 160 to 340 holds the population mean.
 - **False**
The interval doesn't correspond to a 95% confidence level.

7. Which is shorter: a 95% z -interval or a 95% t -interval for μ if we know that $\sigma = s$?
- A. The z -interval is shorter
 - B. The t -interval is shorter
 - C. Both are equal
 - D. We cannot say

Option A is answer. The z -interval is shorter

Questions 8 and 9 are based on the following: To prepare a report on the economy, analysts need to estimate the percentage of businesses that plan to hire additional employees in the next 60 days.

8. How many randomly selected employers (minimum number) must we contact in order to guarantee a margin of error of no more than 4% (at 95% confidence)?
- A. 600
 - B. 400
 - C. 550
 - D. 1000

Option A is the answer

By using Margin Error Formula, we could say that we need 600 randomly selected Employee.

9. Suppose we want the above margin of error to be based on a 98% confidence level. What sample size (minimum) must we now use?
- A. 1000
 - B. 757
 - C. 848
 - D. 543

Option C is the answer.

848 people show be randomly selected.