**Topics: Confidence Intervals**

1. For each of the following statements, indicate whether it is True/False. If false, explain why.
2. The sample size of the survey should at least be a fixed percentage of the population size in order to produce representative results.

Ans: False: A sample size of 30 is considered large enough, but that may

Or may not be adequate.

1. The sampling frame is a list of every item that appears in a survey sample, including those that did not respond to questions.

Ans: False: The sampling frame refers to a list of an item which responds to the

Question and not the ones which do not respond to the question.

1. Larger surveys convey a more accurate impression of the population than smaller surveys.

Ans: True: The larger conveys a more accurate impression of the population as

Larger surveys involve large sample size which reduces the chances of

Error.

1. *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:
2. The population

Ans: PC Magazine readers are the whole population size 9000.

1. The parameter of interest

Ans: The population of interest camera rating(7.5 for Kodak compact digital

camera.

1. The sampling frame

Ans: Readers that rated the products (around 9000)

1. The sample size

Ans: Sample size is 225.

1. The sampling design

Ans: sample design : voluntary survey participation.

1. Any potential sources of bias or other problems with the survey or sample

Ans: The selection of orders, selection of the issue which will contain the survey.

1. For each of the following statements, indicate whether it is True/False. If false, explain why.
2. 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.

Ans: True: That means there is 95% chance that the population mean will fall

Between $50 to $110 hence $100 is a plausible value for the population mean

At this level of confidence.

1. 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.

Ans: False: That means there is 95% chance that the number of moviegoers who

Purchase concessions will fall between 30% to 45%.

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

Ans: False: That means the 95% Confidence-interval for only applies if the sample

Data are normally distributed.

1. What are the chances that ?
2. ¼
3. ½
4. ¾
5. 1

Ans: **B. 1/2** Because the expected value of sample mean is equal to the population mean.

1. 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.
2. **If the sample were based on 2,000 users, could Microsoft conclude that Mozilla has a less than 5% share of the market?**

Ans: No: Sample based on 2000 users Microsoft could not conclude that

Mozilla has a less than 5% share of the market.

1. **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?**

Ans: Yes, Mozilla has less than 5% of Market Share, because the problem statement itself says that Mozilla Firefox has 4.6% of market share based on monitoring of daily internet traffic of all internet users (complete population)

1. 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?
2. All shipments are between 205 and 295 books.

Ans: Incorrect Probability of having all books between 205 and 250 is not there

(Between 24% to 97%), this is evident also from question itself were

Confidence level is taken as 95% that is not all books.

1. 95% of shipments are between 205 and 295 books.

Ans: Incorrect: It is evident as we have used 95% of Confidence level, for the size of

The shipment was 250 ± 45 books.

1. The procedure that produced this interval generates ranges that hold the population mean for 95% of samples.

Ans: Correct: This sample contains population means of 95% of the sample.

1. If we get another sample, then we can be 95% sure that the mean of this second sample is between 205 and 295.

Ans: Incorrect: With 95% confidence level we shall get the same range & mean

Shall also fall between same range.

1. We can be 95% confident that the range 160 to 340 holds the population mean.

Ans: Incorrect: If we increase the class interval range to 160-340, will result in

Increase the value of 1-sigma(1-S.D.), to have class interval of 160-340 we will

Need to increase the confidence level to 99%.

1. Which is shorter: a 95% *z*-interval or a 95% *t*-interval for *μ* if we know that σ =s?
2. The z-interval is shorter
3. The t-interval is shorter
4. Both are equal
5. We cannot say

Ans:  **A The Z-interval is shorter.**

At, confidence level 95%, T-score will 2.262 and Z-score will be 1.96

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.

1. 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)?
2. 600
3. 400
4. 550
5. 1000

Ans: **A.600**

E=4%=0.04

C=95%=0.95

pˆ=unknown

sample size, n=[zα/2]2pˆqˆ/E2 =[zα/2]2 pˆ(1-pˆ)/E2

zα/2=1.96

Therefore, n=1.962×0.25/0.042= 600

The answer is A. 600

1. Suppose we want the above margin of error to be based on a 98% confidence level. What sample size (minimum) must we now use?
2. 1000
3. 757
4. 848
5. 543

Ans:  **C. 848**

Where: n= to be calculated Z for confidence level 98% is 2.33

= 0.04

P Sample proportion, assuming it to be 0.5

n=((2.33) ^2 0.5(1-0.5))/(0.04) ^2

n = (5.43\*0.25)/0.0016 = 848.44