**Question:**

**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.**

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

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

**Answer:**

**I. False. The sample size of a survey should not necessarily be a fixed percentage of the population size. It should be determined based on statistical considerations such as desired level of confidence and margin of error.**

**II. False. The sampling frame typically includes only those items from the population that have a chance of being selected in the sample. Items that did not respond to questions are not part of the sampling frame.**

**III. True. Larger surveys tend to provide a more accurate impression of the population due to the reduced impact of sampling variability.**

**Question:**

**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**

**Answer:**

**A. Population: Readers of PC Magazine**

**B. Parameter of interest: Average satisfaction rating for Kodak compact digital camera among PC Magazine readers**

**C. Sampling frame: List of PC Magazine readers who participated in the survey**

**D. Sample size: 225**

**E. Sampling design: Convenience sampling (all readers of PC Magazine)**

**F. Potential sources of bias or other problems: Self-selection bias (only readers who choose to participate are included), potential bias towards readers who are more likely to provide feedback (either very satisfied or dissatisfied).**

**Question:**

**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.**

**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.**

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

**Answer:**

**I. True. Since $100 falls within the 95% confidence interval, it is plausible that the population mean lies within that range at this level of confidence.**

**II. False. The confidence interval provides a range within which the true parameter is estimated to lie. It does not imply anything about whether the parameter is above or below any specific value within that range.**

**III. False. While the 95% confidence interval is commonly used and provides useful information about the population parameter, it does not strictly require normality of the sample data. Under certain conditions (such as large sample sizes), the Central Limit Theorem allows for the use of confidence intervals even if the underlying distribution is not exactly normal.**

**Question:**

**What are the chances that?**

**A. ¼**

**Answer:**

**A. ¼**

**Question:**

**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?**

**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?**

**Answer:**

**I. Yes. With a sample size of 2,000 users, if the sample proportion is 4.6% and the sample is representative of the population, Microsoft could conclude that Mozilla has a less than 5% share of the market.**

**II. No. Even if WebSideStory claims to include all daily Internet users in their sample, there may still be biases or inaccuracies in their sampling method or data collection process. Therefore, Microsoft cannot conclude solely based on this claim.**

**Question:**

**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.**

**B. 95% of shipments are between 205 and 295 books.**

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

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

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

**Answer:**

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

**Question:**

**Which is shorter: a 95% z-interval or a 95% t-interval for μ if we know that σ =s?**

**A. The z-interval is shorter**

**B. The t-interval is shorter**

**C. Both are equal**

**D. We cannot say**

**Answer:**

**C. Both are equal**

**Question:**

**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**

**Answer:**

**B. 400**

**To ensure a margin of error of no more than 4% at a 95% confidence level, we need a minimum sample size of 400 respondents.**

**Question:**

**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**

**Answer:**

**C. 848**

**To achieve the same margin of error at a 98% confidence level, the minimum sample size needed increases to 848 respondents.**