1. (SET 2)

Consider a company that has two different divisions. The annual profits from the two divisions are independent and have distributions Profit1 ~ N(5, 32) and Profit2 ~ N(7, 42) respectively. Both the profits are in $ Million. Answer the following questions about the total profit of the company in Rupees. Assume that $1 = Rs. 45

1. Specify a Rupee range (centered on the mean) such that it contains 95% probability for the annual profit of the company.
2. Specify the 5th percentile of profit (in Rupees) for the company
3. Which of the two divisions has a larger probability of making a loss in a given year?

ANS: A) The corresponding z-scores of 2.5th percentile is -1.96 & 97.5th percentile is 1.96

Therefore

The rupee range centered on the mean (540 million) is

Lower limit = 540 – (1.96 \* 387) = 197.32 million

Upper limit = 540 + (1.96 \* 387) = 1277.32 million

Thus the Rupee range centered in the mean contains 95% probability is [ 197.32 M to 1277.32 M]

B) z-scores corresponding to the 5th percentile of the SND is -1.645

In dollar’s = 5th percentile = mean + z-score \* STD DEV

= 12 – 1.645 \* 5.167

= 3.162 million $

In rupees = 5th percentile= 3.162 \* 45

= 142.29 million rupees

Therefore the 5th percentile of the total profit of the company in Rupees is 142.29 million rupees

C) for 1 division the probability of making loss is 8.08 %

And for 2 division the probability of making loss is 0.21 %

Therefore Division 1 has more likely to make loss in a given year.

(SET 3) Q.A (i)

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

1. The sample size of the survey should at least be a fixed percentage of the population size in order to produce representative results.

ANS: True (results The sample size should be large enough to ensure that it is representative of the population being studied, one common approach is that the sample size is at least fixed percentage of the population size, this ensures that the survey results are reliable and accurate )

1. (SET 3) Q.A (02) E & F

*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:

1. The population

ANS: more than 9000

1. The parameter of interest

ANS: average rating

1. The sampling frame

ANS: All readers of *PC Magazine*

1. The sample size

ANS: 225

1. The sampling design

ANS: Non probability sampling

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

ANS: 1. Non responsive bias

2.Self -selection bias

3.Social desirability bias

4. Question wording or format

5. Sampling bias

1. (SET 3) Q.A(04)What are the chances that ?
2. ¼
3. ½
4. ¾
5. 1

ANS: Not enough information to answer this question

1. (SET 3) Q.A (05 (i))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