**Assignment Ch 7, 8**

1. Explain the term Finite population correction factor
2. Explain the properties of the Point Estimators
3. Explain the Confidence Coefficient
4. Explain why a planning proportion of 0.5 gives the largest sample size.
5. Suppose that a random sample of 50 bottles of a particular brand of cough syrup is selected and the alcohol content of each bottle is determined. Let µ denote the average alcohol content for the population of all bottles of the brand under study. Suppose that the resulting 95% confidence interval is (7.8, 9.4). Would a 90% confidence interval calculated from this same sample have been narrower or wider than the given interval? Explain your reasoning.
6. A Senate study on the issue of self-rule for the District of Columbia involved surveying 2,00 people from the population of the city regarding their opinion on a number of issues related to self-rule. Washington DC is a city in which many neighbourhoods are poor and many neighbourhoods are rich, with very few neighbourhoods falling between the extremes. The researchers who were administering the survey had reasons to believe that the opinions expressed on the various questions would be highly dependent on income. Which method of sampling is more appropriate? Explain with reason.
7. You want to rent an unfurnished one-bedroom apartment in Durham, NC next year. The mean monthly rent for a random sample of 60 apartments advertised on Craig’s List (a website that lists apartments for rent) is $1000. Assume a population standard deviation of $200. Construct a 95% confidence interval. How large a sample of one-bedroom apartments above would be needed to estimate the population mean within plus or minus $50 with 90% confidence?
8. A machine that fills bottles is known to have a mean filling amount of 125 g and aa standard deviation of 20 g. A quality control manager took random sample of filled bottles and found the sample mean to be 130. The quality control manager concluded the sample is not proper and it does not represent the population properly. Explain with reason, whether his conclusion correct or incorrect?
9. Crash Davis is the line supervisor for a plant of a manufacturer of skates. Close fit is important for skating gear, so Crash tests each days production by selecting a size 13 pair from the line. Crash points out that he selects each pair at random. Is this, in fact, a random sample of the days production, or is it judgemental?
10. Duncan Jones kept careful records of the fuel efficiency of his car. After the first 100 times he filled up the tank, he found the mean was 23.4 miles per gallon (mpg) with a population standard deviation of 0.9 mpg. Compute the 95 percent confidence interval for his mpg.
11. You randomly select 16 coffee shops and measure the temperature of the coffee sold at each. The sample mean temperature is 162.0ºF with a sample standard deviation of 10.0ºF. Find the 95% confidence interval for the population mean temperature.
12. Food Place, a chain of 145 supermarkets, has been bought out by a larger chain. Food Place management claims that each store’s profits have an approximately normal distribution with the same mean, and a standard deviation of $1,200. If the Food Place management is correct, what is the probability that the sample mean for a sample of 36 stores will fall within $200 of the actual mean?
13. An executive is undertaking a survey of the huge number of insurance policies that her company has underwritten. Her company makes a yearly profit on each policy that is distributed with mean $310 and standard deviation $150. The survey must be large enough to reduce the standards error to no more than 1.5 percent of the population mean. How large should her sample be?
14. In a survey of 1000 adults, 662 said that it is acceptable to check personal e-mail while at work. Find the point estimate for the population proportion of adults who say that it is acceptable to check personal e-mail while at work. Construct a 95% confidence interval for the same.
15. You are running a political campaign and wish to estimate, with 95% confidence, the population proportion of registered voters who will vote for your candidate. Your estimate must be accurate within 3% of the true population proportion. Find the minimum sample size needed if no preliminary estimate is available.