Review chapter 8

1) Of 346 items tested, 12 are found to be defective. Construct a 98% confidence interval for the percentage of all such items that are defective. Answer**: (1.18%, 5.76%)**

2) Of 81 adults selected randomly from one town, 64 have health insurance. Find 90% low-confidence bound for the percentage of all adults in the town who have health insurance. **(0.73)**

3) A study involves 634 randomly selected deaths, 29 of them caused by accidents.

a) Construct a 98% confidence interval for the percentage of all deaths that are caused by accidents. **(2.6%, 6.5%).**

b) Find 98% upper-confidence bound for the percentage of all deaths that are caused by accidents. **(6.28%).**

4) In a survey of 5100 T.V viewers, 40% said they watch network news programs.

a) Using the point estimate of p obtained from this sample, find the necessary sample size if we want to be 96% confident that the sample proportion of T.V viewers Who watch network news programs is within 0.01 of that proportion of population.

b) How large must the sample be if we wish to be at least 93% confident that the error in estimating the true value of p is less than 0.02, regardless of the true values of p? **(10086 &2048)**

5) Thirty randomly selected students tool the calculus final. If the sample mean was 82 and the population standard deviation was 12.2, Assume that population has normal distribution.

a) Construct a 99% confidence interval for the mean score of all students. **(75.86; 88.14).**

b) Find a 98% upper-confidence bound for the mean score of all students. **(86.8)**

6) Among a sample of 65 students selected at random from one college, the mean number of siblings is 1.3 with a standard deviation of 1.1.

a) Find a 95% confidence interval for the mean number of siblings for all students at this college. **(1.03; 1.57)**

b) Find a 95% lower-confidence bound for the mean number of siblings for all students at this college. **(1.076)**

7) A major tire manufacturer wishes to estimate the mean tread life in miles for one of their tires. They wish to develop a confidence interval estimate that would have a maximum sampling error of 500 miles with 90 percent confidence. Let population standard deviation equal to 4,000 miles. Based on this information and let $z_{0.05} = 1.645$, the required sample size is: A) 196. B) 124. C) 246. D) 174.

8)) To find the standard deviation of the diameter of wooden dowels, the manufacturer measures 19 randomly selected dowels and finds the variance 0.16.

a.Find the 95% confidence interval for the population standard deviation σ.

b. Find critical value if we want to find 99% lower confidence bound for σ.

9)

10) Given $\bar{x}$ = 15.3, s = 4.7, and n = 18, form a 99% confidence interval for σ^2
A) (13.61, 43.30) B) (10.51, 65.88) C) (2.24, 14.02) D) (11.13, 69.79)

9) To find the standard deviation of the diameter of wooden dowels, the manufacturer measures 19 randomly selected dowels and finds the standard deviation of the sample to be s = 0.16. Find the 95% confidence interval for the population standard deviation σ.

10) The yield of chemical process is being studied. From previous experience yield is known to be normally distributed. The past five days of plant operation have resulted in the following percent yields: 91.6; 88.75, 90.8, 89.95, and 91.3. Find a 98% two-side confidence interval on the true mean yield**. (87.35; 93.61)**

11) The breaking strength of yarn used in manufacturing drapery material is required to be at least 100 psi. Past experience has indicated that breaking strength is normally distributed and that population st dev 2 psi. A random sample of nine specimens is tested and the average breaking strength is found to be 98 psi. Find a 95% two-sided confidence interval on the true mean breaking strength. **(96.69; 99.31)**`

Find 95% upper – confidence bound for population mean.

11b. What sample size is needed to estimate the mean white blook cell count for the population of adults in the United States? Assume that you want 99% confidence that the sample mean is within 0.2 of the population mean. The population standard deviation is 2.5.

12) The percentage of titanium in an alloy used in aerospace castings is measured in 51 randomly selected parts. The sample standard deviation is s = 0.37. construct a 95% two-sided confidence interval for σ. **(0.31; 0.46)**

13) Find the critical value $z_{\alpha/2}$ that corresponds to a degree of confidence of 96%.

14) In an Accounteps survey of 150 senior executives, 47% said that the most common job interview mistake is to have little or no knowledge of the company.
   a) Construct a 99% confidence interval estimate of the proportions of all senior executives who have that same opinion. **(0.365, 0.575)**

b) Construct a 95% lower confidence bound for the proportions of all senior executives who have that same opinion. (**0.4029**)
c) What the sample size should be if we want 97% confidence that the sample proportion is within 0.3 of the population proportion, regardless the true value of population proportion?

15) A simple random sample of 50 adults (including males and females) is obtained, and each person's red blood cell count (in cells per micro liter) is mean-sured. The sample mean is 4,63. The population standard deviation for red blood cell counts is 0,54. Construct a 99% confidence interval estimate of the mean red blood cell count of adults.
16) What sample size is needed to estimate the mean white blood cell count for the population of adults in the United States? Assume that you want 99% confidence that the sample mean is within 0.2 of the population mean. The population standard deviation is 2.5. (**1037**)
17) A sociologist develops a test to measure attitudes about public transportation, and 27 randomly selected subjects are given the test. Their mean score is 76.2 and their standard deviation is 21.4. Construct the 95% confidence interval for the mean score of all such subjects. Assume that the population has a normal distribution. **(67.73, 84.66)**
18)
19)
20) A random sample of 23 movies with ratings of PG or PG-13 have lengths (in minutes) with a mean of 120,8 min and a standard deviation of 22,9 min.
a) Construct a 95% confidence interval estimate of the standard deviation of the lengths of all movies. (**17.71, 32.4**)
b) Construct a 90% lower confidence bound for the standard deviation of the lengths of all movies. (**19.35**)