**Review Exercises**

**for Supplementary Exam**

**Subject:** Business and Economic Statistics

**Part A:** Choose the correct answer by circling **A**, **B**, **C**, or **D**

1. The sampling error is
2. Equal to the population mean.
3. Population parameter
4. Always positive.
5. The difference between sample statistic and the population parameter.
6. Which of the following is NOT a correct statement about the *t* distribution?
7. It is positively skewed.
8. It is a continuous distribution.
9. It has a mean of zero.
10. There is a family of *t* distributions.
11. A Type II error is
12. Accepting a false H0.
13. Rejecting H1 when it is true.
14. Reject H0 when it is true.
15. Not rejecting a false H1.
16. In an ANOVA test there are 5 observations in each of three treatments. The degrees of freedom in the numerator and denominator respectively are:
17. 3, 12
18. 3, 15
19. 2, 4
20. 2, 12
21. In a one-way ANOVA, the null hypothesis indicates that the treatment means
22. are all the same or from equal populations.
23. are not from the same population.
24. are all different.
25. at least one pair of means are the same

**6)** Which of the following are correct statements about confidence intervals?

 **A.** They cannot contain negative numbers.

 **B.** They are always based on the z distribution

 **C.** They must always include the population parameter.

 **D**. None of the above are always correct.

**7)** The endpoints of a confidence interval are called

 **A.** Confidence levels

 **B.** The test statistics

 **C.** The degrees of confidence.

 D. The confidence limits.

8) We select a sample of 15 observations from a normal population and wish to develop a 98 percent confidence interval for the mean. The appropriate value of *t* is

 A. 2.947

 B. 2.977

 C. 2.624

 D. None of the above

**Part 2:**

1. You need to estimate the mean number of travel days per year for outside salespeople. The mean of a small pilot study was 150 days, with a standard deviation of 14 days. If you must estimate the population mean within 2 days, how many outside salespeople should you sample? Use the 90 percent confidence level.
2. Listed below is the rate of return for one year for a sample of 12 mutual funds that are classified as taxable money market funds.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4.63 | 4.15 | 4.76 | 4.70 | 4.65 | 4.52 | 4.70 | 5.06 | 4.42 | 4.51 | 4.24 | 4.52 |

Using the 0.05 significance level is it reasonable to conclude that the mean rate of return is more than 4.50 percent?

1. Stargell Research Associates conducted a study of the radio listening habits of men and women. One facet of the study involved the mean listening time. It was discovered that the mean listening time for men is 35 minutes per day. The standard deviation of the sample of 10 men studied was 10 minutes per day. The mean listening time for the 12 women studied was also 35 minutes, but the standard deviation of the sample was 12 minutes. At the 0.10 significance level, can we conclude that there is a difference in variation in the number of minutes men and women listen to the radio?
2. A state meat inspector in lows has been given the assignment of estimating the mean net weight of packages of ground chuck labeled "3 pounds." Of course, he realizes that the weights cannot be precisely 3 pounds. A sample of 36 packages reveals the mean weight to be 3.01 pounds, with a standard deviation of 0.03 pounds.
	1. What is the estimated population mean?
	2. Determine a 95 percent confidence interval for the population mean.
3. A recent survey of 50 executives who were laid off from their previous position revealed it took a mean of 26 weeks for them to find another position. The standard deviation of the sample was 6.2 weeks. Construct a 95 percent confidence interval for the population mean. Is it reasonable that the population mean is 28 weeks? Justify your answer.
4. The American Restaurant Association collected information on the number of meals eaten outside the home per week by young married couples. A survey of 60 couples showed the sample mean number of meals eaten outside the home was 276 meals per week, with a standard deviation of 0.75 meals per week. Construct a 97 percent confidence interval for the population mean.
5. In a poll to estimate presidential popularity, each person in a random sample of 1,000 voters was asked to agree with one of the following statements:

1. The president is doing a good job.

2. The president is doing a poor job.

3. I have no opinion.

A total of 560 respondents selected the first statement, indicating they thought the president was doing a good job.

* 1. Construct a 95 percent confidence interval for the proportion of respondents who feel the president is doing a good job.
	2. Based on your interval in part (a), is it reasonable to conclude that a majority (more than half) of the population believes the president is doing a good job?
1. The First National Bank of Wilson has 650 checking account customers. A recent sample of 50 of these customers showed 26 to have a Visa card with the bank. Construct the 99 percent confidence interval for the proportion of checking account customers who have a Visa card with the bank.