DISCUSSION SECTION NUMBER TO RETURN EXAM _____

STATISTICS 2023   NAME, IN INK (print)_____

EXAM THREE   SIGNATURE, IN INK_____

FALL 2001   SS NUMBER, IN INK_____

Once this exam is graded and returned to you retain it for grade verification.
TRUE OR FALSE. Answer with a capital T or F.   **(3 points each)**

_____ 1. The variable, the sample mean, has an approximately normal distribution, even when the sample size is very small, regardless of the shape of the original sampled population.

_____ 2. Confidence intervals are constructed to estimate sample statistics and are centered around population parameter values.

_____ 3. The two factors that contribute to the magnitude of the standard error of the sample mean are the variance of the sampled population and the size of the sample.

_____ 4. Ten percent of all the confidence intervals calculated from a 90% confidence level will not contain the population parameter being estimated by the interval.

_____ 5. If a 90% confidence interval to estimate the population mean is (54, 75) then the probability that the population mean is not between 54 and 75 is 10%.

_____ 6. If the data provides a very large p-value and the null hypothesis is not rejected then a researcher would conclude that the data supports the statement in the null hypothesis.

_____ 7. Small samples are only appropriate to construct confidence intervals and perform tests of hypothesis if the sampled population is assumed to be normally distributed.

Use of Z and t tables. State the answer on the line.   **(3 points each)**

_____ 8. What is the area under the Z probability density curve to the left of the z score of -1.49?

_____ 9. What is the value of the t-multiplier that would be used to construct a 90% confidence interval to estimate the population mean from a sample with only twenty-two observations?

_____ 10. What is the t-value in the t-distribution with 20 degrees of freedom that has a right tail area of 1%?

STATE THE ANSWER. Write the answer on the line.   (3 points each)

_____ 11. How many observations would be required to estimate the average standing height of roadrunners with 95% confidence interval to estimate the mean within 0.15 inches if the standard deviation of roadrunner heights is known by ornithologist to be 0.4 inches?

_____ 12. A sample of 196 stocks in a personal portfolio had an average return of 8.2% since the end of the fiscal year and a standard deviation of 1.4%. Based on this sample of 196 stocks what is a 95% confidence interval to estimate the mean return of the population of stocks from which this sample was drawn? State the limits on your interval with three digits past the decimal.

_____ 13. Assume a 99% confidence interval to estimate the mean cost of a semester of full-time college at Oklahoma State University is ($4,800, $5,600). What is the numerical value of the point estimate for the mean cost of a semester of full-time college at Oklahoma State University?

_____ 14. If the test statistic in a two tail z hypothesis test is −1.85, what is the p-value for the test?

_____ 15. If the rejection rule for a right tail z test is to reject the null hypothesis if the test statistic is more than the value 1.96, what is the significance level of the hypothesis . test?

_____ 16. What is the absolute value of the test statistic if the p-value in a two-tail hypothesis test based on a large sample is equal to 0.1052? State a positive value.

_____ 17. If the sum of the data values from a sample with 300 observations is 6,600, what is the numerical value of the point estimate for the mean of the population from which the sample was drawn?

_____ 18. If a researcher knows that the t-test statistic in a left tail hypothesis test based on a sample of 20 observations is equal to the value -3.4, then the p-value of the test would be less than what amount?

An advertiser on the web is interested in estimating the mean number of links that a customer would use from a certain web site. Assume that a random sample of 676 customer visits to a certain web site was examined. Based on this sample the mean number of links used from the web site is equal to 4.8 links with a standard deviation of 2.6 links. Use this information to answer the next four questions.

_____ 19. What is the numerical value of the point estimate for the mean number of links used from the web site?

_____ 20. What is the numerical value of the estimated standard error for the point estimate for the mean number of links used from the web site?

_____ 21. Assume that the estimated standard error of the point estimate for the mean number of links used from the web site is 0.12. What is the numerical value of the bound of error for a 95% confidence interval to estimate the mean number of links used from the web site? State four digits past the decimal.

_____ 22. If the estimated standard error for the point estimate for the mean number of links used from the web site is 0.12 what is the numerical value of the test statistic to test whether the mean number of links used from the web site is 5.1 links?

Four hundred students were questioned about their feelings concerning retaliation for the terrorist attacks with hijacked aircraft on the Twin Towers of the World Trade Center. The students were asked whether or not the United States should bomb terrorist camps located outside Afghanistan in Pakistan and Saudi Arabia. One hundred eight students out of the four hundred questioned stated they thought that known terrorist camps should be bombed even if they were located outside Afghanistan. Use this information to answer the remaining questions on this page.

_____ 23. Based on this sample what is the numerical value of the point estimate for the proportion of students who think that known terrorist camps outside Afghanistan should be bombed?

_____ 24. What is the numerical value of the estimated standard error for the point estimate for the proportion of students who think that known terrorist camps outside of Afghanistan should be bombed? Round to three digits past the decimal.

_____ 25. What is the numerical value of the test statistic to test the hypothesis that less than 30% of students think that known terrorist camps outside Afghanistan should be bombed? Round your answer to two digits past the decimal.

Estimation and Hypothesis Test Question   (3 points each)

In an Assessment Survey the College of Business Administration at Oklahoma State University recorded the starting salaries of twenty-six Accounting graduates. The data yielded a mean of $34,611.54 with a standard deviation of $2,447.26. Use this information to answer the questions on this page.

_____ 26. What is the numerical value of the point estimate for the mean of the population of starting salaries for Accounting graduates from Oklahoma State?

_____ 27. What is the estimated standard error of the point estimate for the mean of the population of starting salaries for Accounting graduates from Oklahoma State? State your answer with three digits past the decimal.

_____ 28. What is the numerical value of the t-multiplier that would be used to construct a 99% confidence interval to estimate the mean starting salaries for Accounting graduates from OSU?

_____ 29. What is the appropriate alternative hypothesis if the Assessment research is checking whether the data supports the idea that the mean starting salary of Accounting graduates from OSU is less than $36,000?

_____ 30. What is the numerical value of the test statistic to test if the mean starting salary of Accounting graduates from OSU is equal to $36,000? Round your answer to two digits past the decimal.

_____ 31. What is the name of the probability distribution of the test statistic in this situation if the mean starting salary of Accounting graduates from OSU is equal to $36,000?

_____ 32. Assume the value of the test statistic is -2.6 to test the hypothesis that the mean starting salary of Accounting graduates from OSU is equal to $36,000, then the p-value for a left tail hypothesis test would be between what two values?

_____ 33. Assume the p-value of the hypothesis test to test the null hypothesis that the mean starting salary of Accounting graduates from OSU is equal to $36,000 is equal to 0.007. Would the null hypothesis be rejected at the significance level of 0.01? Answer yes or no.