STATISTICS 2023 **NAME, IN INK (print)**_____

EXAM THREE **SIGNATURE, IN INK**_____

FALL 2011 **CWID, 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, is a point estimator for the population mean and the probability that an individual value of the sample mean is equal to the population mean is very high.

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

_____ 3. The standard error of the sample mean and the standard error of the point estimator for the population proportion both decrease in magnitude as the size of the sample increases.

_____ 4. Ten percent of all the confidence intervals calculated from an equation for a 90% confidence interval 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 result in 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.

Questions on the t-table. **State the answer on the line. (3 points each)**

_____ 8. What is the P($t > 3.355$) if df=8?

_____ 9. State the value of $t_{0.05(24)}$.

_____ 10. P($t < -1.812$)=?, if the df=10

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 with a margin of error of 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 the 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 ($9,800, $12,600). 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 –1.87, 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, alpha, 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?

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

An advertiser on the web is interested in estimating the mean number of links that a customer would use from a certain website. Assume that a random sample of 676 customer visits to a certain website was examined. Based on this sample, the mean number of links used from the website 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 website?

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

_____21. Assume that the estimated standard error of the point estimate for the mean number of links used from the website 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 website? State your answer with four digits past the decimal.

_____22. If the estimated standard error for the point estimate for the mean number of links used from the website is 0.12, what is the numerical value of the test statistic to test whether the mean number of links used from the website is 5.1 links?

Four hundred students were questioned about their feelings concerning the use of drones to retaliate for suicide bombings in Afghanistan. The students were asked whether or not the United States should use drones to retaliate for suicide bombings. Two hundred eight students out of the four hundred questioned stated they thought that drones should be used to retaliate for suicide bombings. 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 drones should be used?

_____ 24. What is the numerical value of the estimated standard error for the point estimate for the proportion of students who think that drones should be used? Round your answer to three digits past the decimal.

_____ 25. What is the numerical value of the test statistic to test the hypothesis that 50% of the students think that drones should be used? Round your answer to one digit past the decimal.

Estimation and Hypothesis Test Questions **(3 points each)**

In an Assessment Survey the Spears School of Business at Oklahoma State University recorded the starting salaries of twenty-six accounting graduates. The data yielded a mean of $44,611.54 with a standard deviation of $2,447.26. Use this information to answer the questions on this page.

_____ 26. What is the point estimate for the mean of the population of starting salaries for accounting graduates from Oklahoma State University based on this sample?

_____ 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 University based on this sample? State your answer with three digits past the decimal.

_____ 28. What is the t-multiplier that would be used to construct a 99% confidence interval to estimate the mean starting salary for accounting graduates from OSU based on this sample?

_____ 29. What is the appropriate alternative hypothesis if the assessment research is seeking evidence to indicate that the data supports the idea that the mean starting salary of accounting graduates from OSU is less than $46,000?

_____ 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 $46,000? 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 $46,000?

_____ 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 $46,000, 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 $46,000 is equal to 0.007. Would the null hypothesis be rejected at the significance level of 0.01? Answer yes or no.