STATISTICS 2023   NAME, PRINT IN INK_____

EXAM ONE   SIGNATURE, IN INK_____

SPRING 2018   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 variance of a sample measures the typical spread of the sample observations about the sample mean in squared units.

_____ 2. In a frequency or relative frequency graph the width of the bars indicates no information when the variable is qualitative.

_____ 3. If a data set were assumed to be mound-shaped, then approximately 95% of the data is within one standard deviation of the mean.

_____ 4. Sixty-three percent of the values in a data set are greater than the value of the 63rd percentile of the data set.

_____ 5. If the z score is –1.6 for an individual data value from a population with mean of 106 and standard deviation of 28 then the individual data value is equal to 150.8.

_____ 6. If nothing is known about the shape of a data set, then there may be no data within one standard deviation of the mean.

_____ 7. The sample space of an experiment is the set of all possible outcomes of the experiment and the sum of the probabilities of these outcomes always equal to one.

State the Answer. State the answer on the line given   (3 points each)
The weekly changes in a major stock were recorded for 8 weeks during the past month. The changes in percent are stated below.   Use these data to answer the remaining questions on this page.

                2.1   5.2   2.8   -3.4   1.1   -2.2   1.2   -0.4

_____ 8. What is the mean of the data?

_____ 9. What is the sum of the squares of the data?

_____ 10. What is the sample variance of the data? Round to 2 digits past the decimal.

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

_____ 11. How many observations are in a category if the category has a relative frequency of 0.22 and the data set has 650 observations?

_____ 12. What is the numerical value of the standard deviation of a sample of six observations, 62, 26, 42, 24, 46, and 25? Round your answer to two digits past the decimal.

_____ 13. If a random sample of 50 observations produces a sum of squares equal to 2,397.12 and a square of the sum equal to 80,656 what is the numerical value of the sample mean?

_____ 14. If a random sample of 50 observations produces a sum of squares equal to 2,397.12 and a square of the sum equal to 80,656 what is the numerical value of the sample standard deviation?

_____ 15. If a data set with eight hundred observations has 200 ones, 100 twos, 200 threes, and 300 fours, then what is the numerical value of the median?

_____ 16. If a data set with unknown shape has a mean of 145 units and a standard deviation of 15 units then at least what percent of the data would be between the values 115 and 175?

Mesquite trees are spiny, deep-rooted, leguminous trees that grow in the southwest part of the US, including southwestern Oklahoma. At maturity they have an average height of 15 feet with a standard deviation of 1.5 feet. Use this information to answer the remainder of the questions on this page.

_____ 17. Based on the above information approximately what percent of mature Mesquite tree have heights less than 16.5 feet?

_____ 18. Based on the above information only about 2.5% of mature Mesquite trees would be shorter than what height?

_____ 19. Based on the above information the approximate maximum height of mature Mesquite trees is what value?

_____ 20. The scores on a standardized advanced standing test in chemistry have a mean of 56 with a standard deviation of 8. What is the z score associated with the exam grade of 44?

_____ 21. The scores on a standardized advanced standing test in chemistry have a mean of 56 with a standard deviation of 8. What is the exam grade associated with the z score of 1.25?

A random sample of eight roadrunners was collected in the Oklahoma panhandle and the heights in inches of each of the road runners are listed below. Use this sample of roadrunner heights to answer the remainder of the questions on this page.

12.6, 15.2, 14.8, 13.1, 12.9, 14.7, 14.2, 13.2

_____ 22. What percent of the observed roadrunner heights are at least 14 inches?

_____ 23. What is the numerical value of the square of the sum for the above sample of roadrunner heights? State your answer with two digits past the decimal.

_____ 24. What is the numerical value of the mean for the above sample of roadrunner heights? Round your answer to one digit past the decimal.

_____ 25. What is the numerical value of the median for the above sample of roadrunner heights?

_____ 26. What is a numerical value for the standard deviation of the above sample of road runner heights? Round your answer to an integer value.

_____ 27. As the flu season continues to increase in severity, medical specialists are encouraging the public to take the flu shot. Assume that thirty percent of the public takes the flu shot. If a person takes the flu shot, then the probability of getting the flu is only 8%. What is the probability of taking the shot and still getting the flu? State your answer with three digits past the decimal.

_____ 28. Thirty percent of all the employees of a company have an MBA degree. Twenty percent of all of the employees are managers. Of the managers in the company eighty percent have MBA degrees. What is the probability that a randomly chosen employee has an MBA degree or is a manager? Do not round your answer.

Two hundred students at Oklahoma State University were questioned about whether or not they purchased season basketball tickets. It was also recorded in the data whether they were business majors, or not. The results are shown in the following table. Use this table to answer the remainder of the questions on this page.
Do not reduce fractional answers.

	Have a season Basketball Ticket?	
Major at OSU	**Yes**	**No**
business	54	22
Other	36	88

_____ 29. What is the probability of choosing a student who does not have a season basketball ticket? Do not reduce fractional answers.

_____ 30. If the one student chosen is a business major what is the probability that the student has a season basketball ticket? Do not reduce fractional answers.

_____ 31. Given that a student who does not have a season basketball ticket is chosen what is the probability that the student is not a business major? Do not reduce.

_____ 32. What is the probability that if one student is chosen that the student has a basketball ticket and is a business major? Do not reduce fractional answer.

_____ 33. What is the probability that if one student is chosen that the student has a season basketball ticket or is a business major? Do not reduce the fraction.