

STATISTICS 2023

NAME, PRINT IN INK _____

EXAM TWO

SIGNATURE, IN INK _____

SPRING 2009

CWID, IN INK _____

Retain this exam for grade verification once it is graded and returned to you.

TRUE OR FALSE. Answer with a capital T or F.

(4 points each)

_____ 1. A discrete random variable has probability on intervals of values only and no probability at all on any specific value.

_____ 2. If X is a continuous random variable and x_0 is a constant in the range of possible values for X , then the probability $P(X=x_0)$ is 0.

_____ 3. A probability density function represents probability with area under the density curve for intervals of values and a probability mass function represents probability with height at specific values of the variable.

_____ 4. The Binomial and Poisson distributions can both be right skewed, left skewed, or symmetric depending on the value of the parameters.

_____ 5. When a continuous variable has a normal distribution then the probability is equal for any interval of values of the same length within the range of possible values.

_____ 6. The sampling distribution of the sample mean has the same variance as the variance of the population from which the sample was drawn.

STANDARD NORMAL DISTRIBUTION QUESTIONS. State the answer on the line provided.

(4 points each)

_____ 7. Find $z_{0.8944}$, that is, find z_0 if $P(Z > z_0) = 0.8944$.

_____ 8. Find the $P(Z < 1.55)$.

_____ 9. What does the $P(-1.44 < Z < -0.72)$ equal?.

_____ 10. Consider a lottery game in which a person can win \$0, \$2, or \$2,000. If 97% of all the people who play win \$0 and the probability of winning \$2 is only 0.0265, what is the expected winning amount in this lottery game? Round your answer to two digits past the decimal since the answer is in dollars.

_____ 11. Assume that fifteen percent of the files in a certain computer system are contaminated with a computer virus, called ENVIRO. If you choose nine files at random, what is the probability that fewer than five of them are contaminated with the computer virus, ENVIRO? State the answer with four digits past the decimal.

_____ 12. Eighty-two percent of the customers who enter a certain grocery store purchase more than \$10 worth of product. If six customers enter the store what is the probability that more than four of them will purchase more than \$10 worth of product? Round your answer to five digits past the decimal.

_____ 13. If on average the number of car accidents on 6th street in Stillwater, Oklahoma is 0.6 per day what is the probability of at least 2 accidents in one day? State your answer with four digits past the decimal.

A climatologist indicates that the predicted temperature increase over the next century at a specific GPS location point near the South Pole on the continent of Antarctica is uniformly distributed between the values of 2 degree Celsius and 5 degrees Celsius. Use this information to answer the next three questions.

_____ 14. What is the expected temperature increase at this location near the South Pole over the next century?

_____ 15. What is the probability that temperature increase at this location near the South Pole exceeds 3 degrees Celsius over the next century?

_____ 16. There is a ten percent probability that the temperature increase at this location near the South Pole over the next century will be less than how many degrees Celsius?

STATE THE ANSWER. State the answer on the line given.

(4 points each)

The yearly return on a money market fund is normally distributed with a mean of 2.75% and a standard deviation of .5%. Use this information to answer the questions on this page.

_____ 17. Ninety-seven and one-half percent of the yearly returns on this money market are below what value?

_____ 18. What is the probability that the yearly return will exceed 3%?

_____ 19. What is the probability that the yearly return on this money market is between 1.5% and 2.5%?

_____ 20. For the variable, X =yearly return on the money market, find the value of x_0 , such that $P(X > x_0) = 0.2946$.

_____ 21. State the interval centered on the mean that contains 95% of the values for the yearly return on the money market. Use the exact Z value, do not use 2.

A field medical device injects patients with a specific amount of fluid, but the process has a slight amount of variation. One setting on the device has a mean injection amount of 1.25ml with a standard deviation of 0.01ml. Assume that samples of 100 observations were repeatedly recorded from this setting on the field medical injection device. Consider the set of all sample means that would result from the repeated sampling process. Use this information to answer all the problems on this page.

_____ 22. What is the numerical value of the mean of the set of all sample means that result from these repeated samples of 100 observations on this medical injection device?

_____ 23. What is the numerical value of the standard deviation of the set of all sample means that result from these repeated samples of 100 observations on this medical injection device?

_____ 24. What is the probability that the sample mean from the repeated samples of 100 observations on this medical injection device will exceed the value 1.25202?

_____ 25. The sample mean of 100 observations from this field medical injection device will be less than what value 1.7% of the time? State your answer with 5 digits past the decimal.