

STATISTICS 2023

NAME IN INK/PRINT _____

EXAM TWO

SIGNATURE IN INK _____

SPRING 2019

CWID IN INK _____

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

(4 points each)

_____ 1. A continuous random variable has probability on intervals of values, but no probability on specific values.

_____ 2. The mass function for a Poisson random variable can be symmetric, left skewed, or right skewed, depending on the value of the parameter for the variable.

_____ 3. A continuous random variable has probability that described with a probability density function and the area under the curve indicates the probability for a specific interval of values.

_____ 4. A variable that has a normal distribution has approximately 68% of its probability on values that are outside an interval that is within one standard deviation of the mean.

_____ 5. The mean of the sample mean is equal to the mean of the sampled population and the standard deviation of the sample mean is equal to the standard deviation of the sampled population divided by square-root of n.

Z-TABLE QUESTIONS. Write the answer on the line.

+(4 points each)

_____ 6. What is the value of $P(Z < -0.48)$?

_____ 7. What is the value of z_0 , such that the $P(Z < z_0) = 0.03920$

_____ 8. What is the value of $P(-1.62 < Z < 0.64)$?

_____ 9. A promoter is planning an outdoor concert. If it rains the promoter will lose \$22,000, but if it does not rain the profit will be \$54,000. If the chance of rain is .25, what is the expected profit from this concert?

_____ 10. A new type of car designed by an American car company has a 90% chance of exceeding the MPG fuel use rating on the window sticker. Out of seven cars of this type purchased by local taxi service, what is the probability that more than 5 of them will exceed the MPG rating on the window sticker? Round your answer to 4 digits past the decimal.

_____ 11. An accounting firm is investigating 20 corporations. The probability that the firm will identify some accounting problem in any one of these corporations is 0.15. What is the probability that the firm will identify accounting problems in at most 1 of these corporations? Round your answer to 4 digits past the decimal.

_____ 12. If there are 3.4 vehicle accidents on a major highway each month, what is the probability that there will be one or more accidents in a randomly chosen month? Round your answer to 4 digits past the decimal.

Assume that amount of acid needed to clean a specific type of an automotive cylinder is a uniformly distributed random variable between 1 and 3.5 liters. Use this information to answer the next three questions.

_____ 13. What is the average amount of acid needed to clean this special type of an automotive cylinder?

_____ 14. What is the probability that the amount of acid needed to clean this special type of an automotive cylinder is between 1.5 and 2.5 liters?

_____ 15. Twenty percent of the cleaning jobs will use less than how many liters of acid?

At a large hospital complex the time required for an essential prescription medicine to be delivered from the pharmacy to a patient's hospital room is a normally distributed random variable with a mean of 7 minutes and a standard deviation of 1.2 minutes. Use this information to address the questions on this page.

_____ 16. What is the probability that the time required to deliver the prescription medicine is between 4.36 and 8.5 minutes?

_____ 17. Two and one-half percent of the time, the time required to deliver the prescription medicine is more than how many minutes?

_____ 18. What is the probability that the time required to deliver the prescription medicine is between 8.32 and 9.88 minutes?

_____ 19. The thirty-third percentile for this distribution of the time required to deliver the prescription medicine is equal to what value?

_____ 20. The patient gets a price reduction for slow delivery that requires more than 10.6 minutes. What is the probability that a patient will receive this price reduction?

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 2.45ml with a standard deviation of 0.02ml. 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 this repeated sampling process. Use this information to answer the questions on this page.

_____ 21. What is the standard deviation of the resulting sample means from this setting on the field medical injection device?

_____ 22. Sixty-seven percent of the resulting sample means from this setting on the field medical injection device is less than how many ml? State your answer with 5 digits past the decimal.

_____ 23. The medicine being injected by the device can be toxic if too much is injected. What percent of the time is the mean of 100 injections greater than 2.4557ml?

_____ 24. The mean of 100 observations from this field medical injection device will be less than what value 12.1% of the time? State your answer with 5 digits past the decimal.

_____ 25. What is the probability that the resulting sample mean is between 2.448ml and 2.454ml?

