STATISTICS 2023   **NAME IN PRINT**_____

EXAM TWO   **SIGNATURE IN INK**_____

FALL 2005   **ID OR SS IN INK** _____

TRUE OR FALSE. Answer with a capital T or F.   **(4 points each)**

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

_____ 2. A Binomial random variable with 12 trials has probability on exactly 12 discrete points.

_____ 3. A Poisson random variable, regardless of the value of the parameter for the variable, always has a right skewed discrete probability distribution.

_____ 4. The mean or expected value of a discrete random variable is a weighted sum of the values of the variable weighted by their probability.

_____ 5. A variable that has a normal distribution has half of its probability on values that are less than the mean and half of its probability on values that are more than the mean.

_____ 6. The mean of the sample mean is equal to the mean of the sampled population, but the variance of the set of all possible sample means is the original variance multiplied by the number of observations in the sample.

Z-TABLE QUESTIONS. Write the answer on the line.   **(3 points each)**

_____ 7. What is the value of $P(Z < 1.48)$?

_____ 8. What is the value of z_o, such that the $P(Z < z_o) = 0.0735$

_____ 9. What is the value of $P(-2.62 < Z < -0.84)$?

STATE THE ANSWER. Write the answer on the line.   (4 points each)

_____ 10. The possible winnings in a lottery game are $0, $5, and $10,000. If the probability of winning $0 is 0.95 and the probability of winning $5 is 0.045, what is the expected winning of this lottery game? Round your answer to two digits past the decimal.

_____ 11. Assume a uniform discrete random variable has 10 possible values. What would be the cumulative probability on three of the possible 10 values?

_____ 12. 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 fewer than 5 of them will exceed the MPG rating on the window sticker? State your answer with 4 digits past the decimal.

_____ 13. An accounting firm is investigating 6 corporations. The probability that the firm will identify some accounting problem in any one of these corporations is 0.18. What is the probability that the firm will identify accounting problems in at least 5 of these corporations? Round your answer to 5 digits past the decimal.

_____ 14. On average there are 1.6 serious injuries per game in division one college football. What is the probability of at most four injuries in a single game? State your answer with four digits past the decimal.

_____ 15. If there are 5.4 vehicle accidents on a major highway each month what is the probability that there will be one or two accidents in a randomly chosen month? Round your answer to five digits past the decimal.

STATE THE ANSWER. Write the answer on the line.   (4 points each)
Assume that monthly reimbursable employee expense in a small hardware store in Ada is a uniform continuous random variable with possible values between $800 and $1200. Use this information to answer the next three questions.

_____ 16. What is the average monthly reimbursable employee expense for this small hardware store in Ada?

_____ 17. What is the probability that the monthly reimbursable employee expense exceeds $1,075? State your answer with four digits past the decimal.

_____ 18. Fifteen percent of the months the reimbursable employee expense exceeds how many dollars?

At a large state university the in-state single semester tuition cost for a full-time student is normally distributed with a mean of $1,100 and a standard deviation of $125. Use this information to address the remaining questions on this page.

_____ 19. What is the probability that a randomly chosen student's tuition bill will exceed $1,225?

_____20. What is the probability that a randomly chosen student's tuition bill will between $800 and $960?

_____ 21. The single semester tuition bill at this state university will be more than what amount 79.1 percent of the time?

_____ 22. The thirty-third percentile for this distribution of single semester tuition bills is equal to what amount?

STATE THE ANSWER. Write the answer on the line.   (4 points each)

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.

_____ 23. 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?

_____ 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 1.25157?

_____ 25. The mean of 100 observations from this field medical injection device will be less than what value 10.75% of the time?