STATISTICS 2023 **NAME, IN INK**_____

EXAM TWO **SIGNATURE, IN INK**_____

FALL 2004 **SS NUMBER, 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 only has probability on specific values.

_____ 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 height in the graph in the same way as a probability mass function.

_____ 4. The expected value of a variable is defined to be the same as the standard deviation.

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

_____ 6. The sampling distribution of the sample mean has a larger variance than 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_o if $P(Z > z_o) = 0.1660$.

_____ 8. Find the $P(1.21 < Z < 2.50)$.

_____ 9. What is the $P(Z > -0.38)$?

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

_____ 10. Suppose a person is shooting at a very small target. Assume that the person hits the target 2.5 percent of time. If the person hits the target, then that person wins $20,000. If the target is missed the loss is $500. What is the expected amount of money to be won?

_____ 11. Assume that a discrete random variable has the values of 1.5, 2.5, 3.5, and 4.5 with probability of 0.40 on 1.5, 0.30 probability on 2.5, 0.20 probability on 3.5 and the remaining probability on 4.5. What is the probability that such a random variable is at least the value of 3.5?

_____ 12.Fifteen percent of people who buy a ticket in a certain game will win some prize. Assume 7 people purchase these tickets. What is the chance that at most two of them will win? State the answer with four digits past the decimal.

_____ 13.Ten percent of the people who visit Amazon.com, an online book seller, buy a book. If six people go to Amazon.com, what is the probability that fewer than two of them will **NOT** buy a book? State your answer with six digits past the decimal.

_____ 14.If the average number of customers coming to the counter at a diner in 5 minutes is 1.5 what is the probability that at least three customers will come to the counter in 5 minutes? State your answer with four digits past the decimal.

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

The amount of trash generated by a restaurant per month is uniformly distributed between the values of 2 tons and 7 tons. Use this information to answer the next three questions.

_____ 15. What is the expected amount of trash generated monthly by the restaurant?

_____ 16. What is the probability that the restaurant will generate more than 6 tons of trash in one month?

_____ 17. For planning purposes, the restaurant is analyzing the number of tons of trash they produce, so trash bags can be ordered accordingly. Seventy-five percent of the time the amount trash produced is less than how many tons?

The price of a certain stock, X, is normally distributed with a mean of $50 and a standard deviation of $8. Use this information to answer the next four questions.

_____18. Ninety-seven and one-half percent of the time this stock's price will be below what value?

_____ 19. What is the probability that this stock's price will exceed $64?

_____ 20. What is the probability that this stock's price will be between $44 and $60?

_____21. For the variable, X, find the value of x_o, such that $P(X > x_o) = 0.2946$.

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

Assume that a sample of 225 observations was randomly drawn from a population with a mean of 65 and a standard deviation of 60. Use this information to answer the remaining questions.

_____ 22. What is expected value of the sample means that would result from the above situation?

_____ 23. What is the numerical value of the standard deviation of the sample means that would result from the above situation?

_____ 24. Only 0.6% (or 0.006) of the sample means that result from the above sampling situation will be less than what value?

_____ 25. What is the probability that the sample mean that results from the above situation will be between 67.24 and 72.84?