STATISTICS 2023   **NAME, PRINT IN INK**_____

EXAM TWO   **SIGNATURE IN INK**_____

FALL 2010   **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.   **(4 points each)**

_____ 1. Discrete random variables have probability on intervals of values and no probability at all on specific values of the variable.

_____ 2. The expected value of a variable is mean of the variable and indicates the average value of the variable in the long run.

_____ 3. The probability distribution of a discrete random variable indicates the values of the variable and the probability of those values.

_____ 4. The Poisson probability mass function is left skewed, right skewed, or symmetric depending on the value of lamda, the mean of the distribution.

_____ 5. The probability density function for the normal distribution is a bell-shaped curve centered at the value of the mean and has area equal to one under the curve.

Z-table Questions. Write your answer on the line   **(4 points each)**

_____ 6. What is z_o, such that $P(Z< z_o)=0.0630$?

_____ 7. What does $P(.85 < Z < 1.87)$ equal?

_____ 8. What does $P(Z > -2.4)$ equal?

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

_____ 9. 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 $30,000. If the target is missed the loss is $500. What is the expected amount of money to be won?

_____ 10. Assume that a discrete random variable has the values of 15, 25, 35, and 45 with probability of 0.40 on 15, 0.30 probability on 25, 0.20 probability on 35 and the remaining probability on 45. What is the probability that such a random variable is at least the value of 25?

_____ 11. Thirty-five percent of people who enter an electronic equipment store make a purchase. Assume 20 people enter the store. What is the probability that seven or fewer of the people make a purchase? State the answer with four digits past the decimal.

_____ 12. Eighteen percent of the people who visit the Amazon.com website buy some product. If five people go to Amazon.com, what is the probability that at least four of them will buy some product? Round your answer to five digits past the decimal.

_____ 13.If the average number of customers coming to the counter at a diner in 5 minutes is 2.6, what is the probability that fewer than two customers will come to the counter in 5 minutes? Round your answer to five digits past the decimal.

_____ 14. If the average number of accidents in a chemical manufacturing plant is 1.7 per year what is the probability that more than three accidents will occur in one year? State your answer with four digits past the decimal.

STATE THE ANSWER. State the answer on the line given.   (4 points each)
When monetary amounts are rounded to the nearest dollar the amount of round-off error is a uniformly distributed random variable between the values of -50 cents and +50 cents. Use this information to answer the next two questions.

_____ 15. What is the probability that the round-off error is within 20 cents of zero?

_____ 16. Fifteen percent of the time the round-off error will exceed what positive amount?

The yearly return on a common stock is normally distributed with a mean of 12% and a standard deviation of 8%. Use this information to answer the next five questions.

_____ 17. What is the thirty-third percentile of the distribution of return on the common stock?

_____ 18. What is the probability that the yearly return on this common stock is between 2% and 10%?

_____ 19. Sixty-seven percent of the time the yearly return on this common stock is less than what percent?

_____ 20. One and one-half percent of the time the yearly return on this common stock exceeds what percent return? That is, find Xo, such that $P(X>Xo)=0.0150$.

_____ 21. What is the probability that this common stock will lose money?

STATE THE ANSWER. State the answer on the line given.   (4 points each)
The lifetime of a computer hard drive is measured in months until failure of the hard drive. A certain type of hard drive has a mean lifetime of 32 months with a standard deviation of 8 months. Assume that random samples of size sixty-four were repeatedly drawn from hard drives of this type that had failed and the lifetimes in months were recorded.   Use this information to answer the questions on this page.

_____ 22. What is the numerical value of the mean of the sampling distribution of the sample mean that would result from repeated samples of sixty-four of these computer hard drives?

_____ 23. What is the numerical value of the standard deviation of the sampling distribution of the sample mean that would result from repeated samples of sixty-four of these computer hard drives?

_____ 24. Based on the sampling situation described above what is the probability that a sample mean will be greater than 29.6 months?

_____ 25. Only 2.5% of the sample means that occur from the sampling situation described above will exceed what value?