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. The height of college freshmen at Oklahoma State University is a discrete random variable and the weight of college freshmen is a continuous random variable.

_____ 2. The number of times that a single fair die rolls a six out of 10 independent tosses of the die is a Binomial random variable with n=10 and p=1/6.

_____ 3. The probability distribution of a discrete random variable is referred to as a density function and is illustrated by the graph of a bell shaped curve.

_____ 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 sampling distribution of the sample mean is approximately normally distributed if the sample size is adequately large, the mean of the sampling distribution is equal to the mean of the sampled population, and the variance of the sampling distribution is equal to the variance of the sampled population.

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

_____ 6. What is z_o, such that $P(Z< z_o)=0.0749$?

_____ 7. What does $P(0.65<Z<2.87)$ equal?

_____ 8. What does $P(-.45<Z<2.27)$ equal?

_____ 9. Assume that a discrete random variable has four possible values, 25, 35, 45, and 55. If the probability on each of the first two values, 25 and 35, is 0.35 and the remaining probability is divided equally for the other two values of the variable, 45 and 55, then what is the expected value of such a random variable?

_____ 10. Consider a lottery game where the players either win $0, $200, or $12,000. If the probability of winning nothing is 0.98 and the probability of winning $200 is 0.019. What is the standard deviation of the winnings of such a lottery game? Round your answer to **three** digits past the decimal.

_____ 11. Assume you play an on-line computer game 20 times and the chance that you win any one game is 0.15. What is the probability of you winning at most 4 times out of the 20 games? State your answer with four digits past the decimal.

_____ 12. A machine that produces parts for computer keyboards has malfunctioned and is producing 8% defective parts. If your company purchases 12 of these parts, what is the probability that one or more of the parts is defective? Round your answer to five digits past the decimal.

_____ 13. A lawyer wins an average of 1.1 settlements in favor of her clients every month. What is the probability that she will win at least three settlements in a randomly chosen month? State your answer with four digits past the decimal.

_____ 14. The safety supervisor at a large manufacturing plant knows that the average number of industrial accidents per month at the plant is 2.2. What is the probability of fewer than 2 accidents occurring at the plant next month? Round your answer to five digits past the decimal.

STATE THE ANSWER. State the answer on the line given.   (4 points each)
The rate at which a swimming pool is filled with water, called the fill rate, is uniformly distributed between 30 and 35.2 gallons per minute. Use this information to answer the next three questions.

_____ 15. What is the mean fill rate at which the swimming pool is filled?

_____ 16. What is the probability that the fill rate is within one standard deviation of the mean fill rate? Round your answer to four digits past the decimal.

_____ 17. What is the probability that the fill rate is between 31 and 32.3 gallons per minute?

The amount of dark blue dye in a one gallon paint mix for light blue paint is a normally distributed random variable with a mean of 1.75 milliliter and a standard deviation of 0.15 milliliter. Use this information to answer the remaining questions on this page.

_____ 18. What is the probability that the amount of dark blue dye in a gallon of paint mix is less than 1.375 milliliter?

_____ 19. What is the probability that the amount of dark blue dye in a gallon of paint mix is between 1.8325 milliliter and 2.0875 milliliter?

_____ 20. Two and a half percent of the time the amount of dark blue dye in a gallon of paint mix is less than what milliliter? State your answer with three digits past the decimal.

_____ 21. What is the sixty-seventh percentile value for the distribution of dark blue dye in a gallon of paint mix? State your answer with three digits past the decimal.

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

A cigar factory produces thick cigars that have a mean diameter of 14 centimeters. Since the cigars are hand-rolled, they are not all exactly the same diameter. The standard deviation of the cigar diameter is 1.4 centimeters. The cigar factory is interested in maintaining a reasonably consistent diameter so the factory takes repeated samples of 49 cigars chosen randomly each day. Use this information to answer the questions on this page.

_____ 22. What is the mean of all possible cigar diameter sample means that would result from the above situation?

_____ 23. What is the standard deviation of all possible cigar diameter sample means that would result from the above situation?

_____ 24. Thirty-three percent of the cigar diameter sample means that result from the above sampling situation will be more than what value? State your answer with three digits past the decimal.

_____ 25. What is the probability that the cigar diameter sample mean which results from the above situation will be between 13.55 and 14.61 centimeters?