

Which Instructor is your teacher? Circle One.

Stengle

Masters

STATISTICS 2023 NAME, PRINT IN INK _____

EXAM TWO SIGNATURE, IN INK _____

SPRING 2003 SS or OSU ID #, 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. A continuous random variable is a variable that only has probability on intervals of values and no probability at all on specific values.

_____ 2. The probability mass function for a discrete random variable is a function that indicates how much probability is assigned to each value of the random variable.

_____ 3. The standard normal distribution is a symmetric distribution which always has a standard deviation equal to one, but the mean can be any value.

_____ 4. The variance of the sampling distribution of the sample mean is equal to the original variance of the population from which the sample is drawn multiplied by the number of observations in the sample, so that the variance of the sample mean is always more than the original population variance.

_____ 5. When a continuous variable has a uniform distribution then the probability density function has a constant value over the range of possible values.

STANDARD NORMAL DISTRIBUTION QUESTIONS.

STATE THE ANSWER State the answer on the line provided.

(4 points each)

_____ 6. Find z_0 if $P(Z > z_0) = 0.9909$.

_____ 7. Find the $P(1.04 < Z < 2.54)$.

_____ 8. What is the $P(Z > 2.12)$?

_____ 9. Consider a lottery game in which a person can win \$0, \$500 or \$20,000. If only 5 people out of 35,000 people who play the lottery game win the \$20,000 prize and 10 out of the 35,000 win the \$500 dollar prize what is the expected winnings in such a lottery game?

_____ 10. Assume that a discrete random variable has five possible values, 5, 10, 15, 20, and 25. If there is 0.05 probability on each of the last two values, 20 and 25, and the remaining probability is divided equally for the other three values of the variable, 5, 10, and 15, then what is the probability that such a random variable is at least the value of 15?

_____ 11. Thirty-five percent of the students at the University have at some time received a parking ticket on campus. Out of six randomly chosen students what is the probability that more than three of them have received a parking ticket on campus? State the answer with four digits past the decimal.

_____ 12. A star basketball player at Oklahoma State University hits 79% of his free throw attempts. If this player is fouled while shooting a three-point basket he would be allowed three free throw attempts. When this player is allowed three free throw attempts what is the probability that he will hit at least one of them? State your answer with six digits past the decimal.

_____ 13. A major accounting firm recently announced that twenty-seven percent of all of its accounts are embedded in financial consulting accounts, a situation which causes concern about the validity of the accounting. What is the chance that out of 5 randomly chosen accounts that only 1 or none is embedded in financial consulting accounts? Round your answer to five digits past the decimal.

_____ 14. The average number of lightning bugs seen within one hour on any given evening by the lake is 23. What is the probability that you would see 12 lightning bugs during an hour sitting by the lake tomorrow night? Round your answer to five digits past the decimal.

_____ 15. On average there are 15 reported thefts on campus in one month. What is the probability of at least five thefts in one month if the average is 15? State your answer with four digits past the decimal.

The amount of blood needed at a hospital during each twenty-four hour period is uniformly distributed between the values of 600 pints and 1,600 pints. Use this information to answer the next three questions.

_____ 15. What is the expected amount of blood needed at this hospital in a twenty-four hour period?

_____ 16. What is the probability that the hospital would need more than 1,400 pints of blood in a twenty-four hour period?

_____ 17. To provide appropriate services, the hospital needs to have in storage the amount of blood needed for next twenty-four hour period. How many pints of blood should they have in storage at the beginning of each twenty-four period if they want to have enough blood in storage so that there is only a 2% chance of running out of blood in any twenty-four hour period?

STATE THE ANSWER. State the answer on the line given.

(4 points each)

The amount of time a college student spends sleeping each day is normally distributed with a mean of six hours and a variance of 0.64 hours.

_____ 19. Ninety five percent of the time a college student sleeps between what two hour values? State the two values. State your answers with three digits past the decimal.

_____ 20. What is the probability that a student gets more than eight hours of sleep? State your answer with three digits past the decimal.

_____ 21. Only 1.5% of the time a college student sleeps less than how many hours? State your answer with three digits past the decimal.

Assume that a sample of 144 observations was randomly drawn from a population with a mean of 71 and a standard deviation of 24. Use this information to answer the remaining questions.

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

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

_____ 24. Only 2.5% (or 0.025) 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 which results from the above situation will be between 68.62 and 74.52?