

STATISTICS 2023

NAME, IN INK \_\_\_\_\_

EXAM TWO

SIGNATURE, IN INK \_\_\_\_\_

SPRING 2018

CWID, 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. The number of credit hours that a student completes each semester while in college is a discrete random variable.

\_\_\_\_\_ 2. The Binomial random variable is the number of trials that would occur in a set time or spatial period.

\_\_\_\_\_ 3. The probability structure for a discrete random variable is represented graphically with curves known as probability density functions.

\_\_\_\_\_ 4. The normal distribution always has half of the probability on values that are less than the mean of the variable and half of the probability on values that are greater than the mean of the variable.

\_\_\_\_\_ 5. For a uniform continuous random variable, the unit of probability is spread across the values of the variable in the shape of the bell shaped curve.

\_\_\_\_\_ 6. The probability that a normally distributed random variable has values that are within three standard deviations of the mean is 99.73%.

**STANDARD NORMAL DISTRIBUTION QUESTIONS. State the answer on the line provided.**

(4 points each)

\_\_\_\_\_ 7. Find  $z_0$ , such that  $P(Z > z_0) = 0.98713$ .

\_\_\_\_\_ 8. Find the  $P(-0.4 < Z < 1.54)$ .

\_\_\_\_\_ 9. What is the  $P(Z > 1.53)$ ?

\_\_\_\_\_ 10. A discrete random variable has probability of 0.10 on each of the values 10, 20, 30, and 40. The other two values of the variable are 50 and 60, each having equal probability. What is the expected value of this discrete random variable?

\_\_\_\_\_ 11. If a coin with probability of 0.25 on the outcome of head is tossed 11 times, what is the expected number of heads from this experiment?

\_\_\_\_\_ 12. A difficult computer game allows its opponent to win only 5% of the time. If this game is played seven times what is the probability that the computer's opponent will win fewer than 2 times? State the answer with four digits past the decimal.

\_\_\_\_\_ 13. If on average there are 4.6 patients admitted to a certain hospital every day, what is the probability that four patients will be admitted in one day? Round your answer to four digits past the decimal.

\_\_\_\_\_ 14. If the University of Oklahoma has on average 2.8 team fouls for every five minutes of basketball play what is the probability that in five minutes of play that OU has one or fewer fouls? Round your answer to three digits past the decimal.

**A small company in Altus, Oklahoma** reimburses their employees for expenses each month. The amount of employee reimbursements each month is uniformly distributed between the values of \$4,000 and \$8,000. Use this information to answer the next three questions.

\_\_\_\_\_ 15. What is the expected amount of employee reimbursement per month at this company in Altus, Oklahoma?

\_\_\_\_\_ 16. What is the probability of employee reimbursements exceeding \$7,500 next month?

\_\_\_\_\_ 17. For budgeting purposes, the company needs to estimate next month's employee reimbursement expenses. How much money should the company budget if they want the probability of exceeding the budgeted amount to be only 0.30?

Assume that the daily profit in a small business in Stillwater, Oklahoma is a normally distributed random variable with a mean of 175 dollars and a standard deviation of 10 dollars. Use this information to answer the next four questions.

\_\_\_\_\_ 18. Two and one-half percent of all the values of the random variable, daily profit, is less than what value?

\_\_\_\_\_ 19. If the distribution of daily profit is as described above, what is the probability that daily profit has values between \$180.00 and \$193.80?

\_\_\_\_\_ 20. If the distribution of daily profit is as described above, then what is the value of the 33<sup>rd</sup> percentile of the distribution of daily profit?

\_\_\_\_\_ 21. What is the probability that the daily profit is less than \$150 or more than \$200?

Assume that a risky tax-sheltered investment has a mean daily return of \$35 with a standard deviation of \$24. Assume further that samples of size sixty-four are repeatedly drawn from this population of investment returns. Use this information to answer the questions on this page.

\_\_\_\_\_ 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 0.025% (or 0.00025) of the sample means that result from the above sampling situation will be more than what value? State two digits past the decimal.

\_\_\_\_\_ 25. What is the probability that the sample means that result from the above situation will be between \$26 and \$40?

